

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
CENTERS FOR DISEASE CONTROL  
NATIONAL INSTITUTE FOR OCCUPATIONAL  
SAFETY AND HEALTH

+ + + + +

ADVISORY BOARD ON RADIATION  
AND WORKER HEALTH

+ + + + +

TBD-6000/6001, APPENDIX BB WORK GROUP

+ + + + +

WEDNESDAY  
DECEMBER 16, 2009

+ + + + +

The Work Group convened in the Zurich Room of the Cincinnati Airport Marriott Hotel, Hebron, Kentucky, at 9:30 a.m., Paul L. Ziemer, Chairman, presiding.

MEMBERS PRESENT:

PAUL L. ZIEMER, Chairman  
JOSIE BEACH, Member  
MARK GRIFFON, Member\*  
WANDA I. MUNN, Member  
JOHN W. POSTON, SR., Member

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## ALSO PRESENT:

TED KATZ, Designated Federal Official  
NANCY ADAMS, NIOSH Contractor\*  
DAVE ALLEN, OCAS  
BOB ANIGSTEIN, SC&A  
PAT COGGINS, Petitioner  
JOHN DUTKO, Petitioner  
EMILY HOWELL, HHS  
JOHN MAURO, SC&A  
DANIEL McKEEL, Petitioner\*  
JAMES NETON, OCAS  
JOHN RAMSPOTT, General Steel Site Expert\*  
WILLIAM THURBER, SC&A\*  
MARGARET WOJCIK, Bliss & Laughlin Steel\*

\*Participating via telephone

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

2 (9:29 a.m.)

3 MR. KATZ: Good morning, everyone  
4 in the room and on the line. This is Ted  
5 Katz, the Designated Federal Official for the  
6 Advisory Board on Radiation and Worker Health.  
7 This is the TBD-6000/6001 Work Group, and  
8 we're going to begin right away with roll  
9 call, beginning with Board members in the  
10 room.

11 CHAIRMAN ZIEMER: Paul Ziemer,  
12 Chair of the Work Group.

13 MEMBER MUNN: Wanda Munn, member  
14 of the Work Group.

15 MEMBER POSTON: John Poston,  
16 member of the Work Group.

17 MEMBER BEACH: Josie Beach, member  
18 of the Work Group.

19 MR. KATZ: And Board members on  
20 the line.

21 MEMBER GRIFFON: Mark Griffon,  
22 member of the Work Group.

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1 MR. KATZ: Hi, Mark. Any other  
2 Board members participating, listening in?

3 (No response.)

4 MR. KATZ: Okay, and then in the  
5 room, the NIOSH ORAU team. And please, the  
6 Board members, none of the Board members have  
7 conflicts, but everyone else please speak to  
8 conflict as well. NIOSH-ORAU team in the  
9 room.

10 DR. NETON: Jim Neton, OCAS. No  
11 conflicts with GSI.

12 MR. ALLEN: Dave Allen, NIOSH, no  
13 conflicts.

14 MR. KATZ: Thank you, and NIOSH-  
15 ORAU team on the line? Are you expecting  
16 anyone, Dave, on the line?

17 MR. ALLEN: No.

18 MR. KATZ: No. Oh, okay. Then  
19 SC&A team in the room?

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

22 DR. ANIGSTEIN: Bob Anigstein,

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1 SC&A, no conflict.

2 MR. KATZ: And SC&A team on the  
3 line? Are you expecting any?

4 MR. THURBER: Bill Thurber, SC&A,  
5 no conflicts.

6 MR. KATZ: Welcome, Bill.

7 MR. THURBER: Thanks.

8 MR. KATZ: That's it? Okay. And  
9 then HHS officials or contractors or other  
10 government staff or contractors in the room?

11 MS. HOWELL: Emily Howell, HHS.

12 MR. KATZ: And on the line?

13 (No response.)

14 MR. KATZ: Anyone from HHS, from  
15 DOE, from DOL?

16 (No response.)

17 MS. ADAMS: Ted, it's Nancy Adams.  
18 I got disconnected.

19 MR. KATZ: Hi, Nancy, welcome.  
20 Nancy Adams. Okay. Then we have members of  
21 the public or staff of Congressional offices  
22 on the line.

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1 CHAIRMAN ZIEMER: That wish to be  
2 identified.

3 MR. KATZ: Who wish to be  
4 identified.

5 DR. McKEEL: Yes. This is Dan  
6 McKeel. I'm the GSI SEC petitioner.

7 MR. KATZ: Welcome, Dan.

8 MR. RAMSPOTT: John Ramspott,  
9 General Steel site expert.

10 MR. KATZ: Hi, John, welcome.

11 MR. RAMSPOTT: Thank you.

12 CHAIRMAN ZIEMER: Is that it?

13 MR. KATZ: Okay. Then let me just  
14 remind everyone on the line to please mute  
15 your phones, except when you're addressing the  
16 Work Group.

17 \*6 if you don't have a mute button  
18 and then \*6 again to take it off mute, and  
19 please disconnect if you need to leave the  
20 call for a while. Don't put the call on hold  
21 at any time.

22 CHAIRMAN ZIEMER: Okay. Thank

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1 you. Let's officially call the meeting to  
2 order then. I want to check first with  
3 everyone to make sure you have a copy of the  
4 agenda. I think all the members in the room  
5 do. Let me check with Mark. Did you get your  
6 agenda by email, Mark?

7 MEMBER GRIFFON: Yes, I did.

8 CHAIRMAN ZIEMER: Thank you, very  
9 much. I want to check with the petitioner,  
10 Dr. McKeel.

11 DR. McKEEL: Yes, I do. Thank  
12 you.

13 CHAIRMAN ZIEMER: And, John  
14 Ramspott, I don't think I sent you one, but we  
15 can forward a copy probably here readily.

16 MR. RAMSPOTT: I'll be able to  
17 follow you, Paul. I'm fine.

18 CHAIRMAN ZIEMER: Yes, okay. And  
19 others, let me see who else is on the phone  
20 here. Nancy Adams, you probably don't have  
21 the agenda; is that correct?

22 MS. ADAMS: Correct.

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1 CHAIRMAN ZIEMER: What's she  
2 saying?

3 MR. KATZ: Yes, correct.

4 CHAIRMAN ZIEMER: Correct, okay.  
5 And I'm not sure if Bill Thurber -- did I send  
6 you a copy? I think I did.

7 DR. MAURO: Bill?

8 MR. THURBER: Yes, I've got it.

9 CHAIRMAN ZIEMER: You've got it,  
10 okay. So I think we're okay to proceed then.

11 MS. WOJCIK: Excuse me?

12 CHAIRMAN ZIEMER: Yes.

13 MS. WOJCIK: Margaret Wojcik.

14 MR. KATZ: I'm sorry. It's hard  
15 to hear you. Can you repeat?

16 MS. WOJCIK: Yes. I'm Margaret  
17 Wojcik from Bliss & Laughlin Steel. Never  
18 received an agenda.

19 CHAIRMAN ZIEMER: We're going to  
20 try to get it to you shortly here.

21 MS. WOJCIK: Thank you.

22 CHAIRMAN ZIEMER: And

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1 incidentally, Bliss & Laughlin will not come  
2 up until late in the meeting. It will  
3 probably be mid to late-afternoon, for  
4 informational purposes.

5 MS. WOJCIK: All right.

6 CHAIRMAN ZIEMER: Now let me just  
7 take a brief moment to give us an overview of  
8 the agenda. We are going to begin with the  
9 TBD-6000 findings matrix. There are a couple  
10 of items there that we need to address at this  
11 time.

12 Then we'll move to the Appendix BB  
13 issues matrix and try to clarify several items  
14 there, and then move into the GSI SEC Petition  
15 Evaluation Report and the SC&A review, and  
16 there we want to determine next steps on some  
17 of those items.

18 We have the initial SC&A replies.

19 We have the NIOSH responses, and then we have  
20 additional SC&A replies to those responses.  
21 Also we have a number of petitioner concerns  
22 have been enumerated in the last few days, and

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1 I want to make sure we have those on the  
2 record, and then we can identify a path  
3 forward on the Petition Evaluation.

4 Then we will look at Bliss &  
5 Laughlin, and there mainly we're going to  
6 determine if we're able to today, whether or  
7 not we need a more formal SC&A review to  
8 clarify the SEC issues. In that connection,  
9 we'll at least briefly look at the Evaluation  
10 Report.

11 Then we're going to also get an  
12 update on Electro-Metallurgical, which is also  
13 a newly-assigned petition for us, and that's  
14 been under SC&A review, and we'll at least get  
15 a status report of that. We don't have that  
16 review as yet.

17 So that's kind of an overview.  
18 I've indicated in your agenda we'll take a  
19 break at approximately noon, sort of depending  
20 on where we are at that point. We're going to  
21 adjourn at five o'clock. There's a lot of  
22 issues before us.

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1           We will not necessarily come to  
2 closure on all of these issues, but we are  
3 going to be, as it were, pecking away at them.

4       We'll obviously have to meet again fairly  
5 early in the new year, so we'll get as much  
6 done as we're able to today and then proceed  
7 from that point.

8           So let's begin with the TBD-6000  
9 findings matrix, and we have from Dave Allen a  
10 White Paper that was distributed fairly  
11 recently, December 10th, December 10th, just  
12 roughly a week ago. So I'm going to ask Dave  
13 just to briefly review that paper.

14           We also have -- or at least I do,  
15 and I think this went to everyone -- we also  
16 have some comments from Dr. McKeel, and  
17 perhaps we can answer those questions as well  
18 and any questions that SC&A will wish to  
19 comment on that as well.

20           So Dave, if you want to just give  
21 us a brief overview of the White Paper, that  
22 would be a good start.

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1                   MR. ALLEN:        Okay.        A brief  
2       overview of that, what I called Issue 1 in  
3       there, Issue 1 of the TBD.

4                   CHAIRMAN ZIEMER:    Issue 1 of TBD-  
5       6000.

6                   MR. ALLEN:    And the issue was that  
7       the TBD did not address the phenomenon of some  
8       of the thorium-234 and protactinium-234m  
9       uranium decay products concentrating near the  
10      surface of a uranium ingot once it's remelted  
11      and cast into an ingot.

12                   Originally, we said that -- we  
13      agreed that the TBD would benefit from a  
14      discussion of that, and I believe SC&A's reply  
15      was yes, that's what we said, and I think it  
16      was the last Work Group meeting I tried to  
17      clarify, because I was under the impression  
18      that if other favorable assumptions in the TBD  
19      did cover that external dose, and I wanted to  
20      make sure we were on the same page.

21                   After the last Board meeting or  
22      after the last Work Group meeting, it was

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1 clear we weren't, that SC&A felt there was  
2 some additional dose to be gained there,  
3 whereas I thought that it was covered. So the  
4 agreement was that I put together this White  
5 Paper.

6 CHAIRMAN ZIEMER: Right.

7 MR. ALLEN: And the White Paper  
8 looked at the Fernald. We have a database of  
9 Fernald external doses for pretty much the  
10 entire time frame, 1953 to 2006. Fernald did  
11 a great deal of this recasting in two  
12 different plants there. There were hundreds  
13 or dozens of guys working on it at any one  
14 time, 24-7 around the clock for decades.

15 So any dose associated with this  
16 should show up in at least the higher guides  
17 in that population. So I compared the TBD-  
18 6000 95th percentile because TBD-6000 has a  
19 distribution in it. I compared that to the  
20 maximum Fernald, both deep and shallow dose,  
21 and in that comparison, TBD-6000 does show  
22 that it's favorable.

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1           Just a very small little table  
2 near the bottom there that shows the shallow  
3 dose, 95th percentile and TBD-6000 was 293  
4 rem, whereas the maximum shallow dose at  
5 Fernald was 52 rem.

6           On the deep side, it was 29 rem  
7 for the 95th percentile of TBD-6000, compared  
8 to a maximum of 12 rem at Fernald. That's  
9 pretty much where the White Paper ended.

10           CHAIRMAN ZIEMER:     Okay.     John  
11 Mauro, did you have some comments on that for  
12 us?

13           DR. MAURO:     Yes.     As a matter of  
14 fact, Bill Thurber, I asked Bill to follow up  
15 on that. He's reviewed your work. Bill's on  
16 the line. Bill actually prepared a White  
17 Paper that came out to me, for my use today,  
18 not for distribution.

19           CHAIRMAN ZIEMER:     We don't have it  
20 though?

21           DR. MAURO:     You do not have it,  
22 and you may very well have it after we finish

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1 this discussion. But just to let you know  
2 that we have done some homework, and I will  
3 just give you what I call the 30 second sound  
4 bite, but ask Bill to go into a little bit  
5 more detail on what we did and where we come  
6 out.

7 The bottom line is there's no  
8 doubt -- the bottom line goes like this. TBD-  
9 6000 gives you a distribution for external  
10 exposure, okay, and the guidance it gives you,  
11 I believe, is that here's your distribution  
12 for external exposure. Use the full  
13 distribution, depending on the category of the  
14 worker you use for external exposure.

15 Now if you're at a facility that  
16 is handling where the -- I'm going to call it  
17 the Puzier effect, okay. So for the sake of  
18 making it easier, whenever you have an ingot  
19 that has been recently cast, there's a real  
20 potential for the thorium and protactinium to  
21 find its way to the outside surface. We know  
22 that. That does occur.

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1           As a result of that, the radiation  
2 field that's in the immediate vicinity, both  
3 beta and gamma, is quite a bit higher than,  
4 you know, than it's clean. In fact, the  
5 numbers are, for example, the dose rate,  
6 penetrating dose rate one foot from uranium,  
7 pure uranium, is 2 mR per hour.

8           But when the Puzier effect is in  
9 place, it could be 10 to 20 times higher, 10  
10 to 15 times higher. So the Puzier effect is a  
11 real phenomenon. So that was our concern.

12           Now it turns out that -- I'm  
13 saying more than I really wanted to, as usual  
14 -- that the 95th percentile value in TBD-6000  
15 is very conservative. The dose you would --  
16 if you were to use a 95th percentile value in  
17 TBD-6000 with the external exposed. You  
18 caught it. You picked it up.

19           Question, you know, and the way I  
20 look at the world, okay great. Does that mean  
21 when you're at a site and you're doing a dose  
22 reconstruction for a guy, who may have very

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1 well worked with an ingot where the Puzier  
2 effect might be in place, are you going to  
3 assign the 95th percentile, as opposed to the  
4 geometric mean, because we have this special  
5 circumstance?

6 If the answer to that question is  
7 yes, this discussion's over. I guess that's -  
8 - so, yes, you've made a very powerful point,  
9 that the 95th percentile of the distribution  
10 does capture, more than capture the Puzier  
11 effect. The real question is is that what  
12 you're going to do when you think the Puzier  
13 effect is at play?

14 MR. ALLEN: And the answer is  
15 right now TBD-6000 assigns a distribution.

16 DR. MAURO: Right. So therein  
17 lies the essence of our concern. Now Bill did  
18 a lot of work. I mean I took --

19 (Whereupon, the above-entitled  
20 matter went off the record at 9:45 a.m. and  
21 resumed at 9:46 a.m.)

22 CHAIRMAN ZIEMER: Okay, we're back

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1 on.

2 MR. KATZ: Okay. We're back  
3 online.

4 CHAIRMAN ZIEMER: Okay Bill, so  
5 Bill Thurber, did you have some comments.

6 MR. THURBER: Yes, just a couple  
7 to amplify a little bit on what John said.  
8 First of all, as Dave had indicated, NIOSH has  
9 a very large database from Fernald, which they  
10 use.

11 Just to check on that, we did a  
12 quick look at some data from ElectroMet and  
13 from Mallinckrodt, and while the numbers were  
14 a little different than the Fernald max, they  
15 are certainly in the same ballpark and support  
16 the position in the little table at the bottom  
17 of David's White Paper. So there is other  
18 data that supports that position.

19 The second thing is this. In TBD-  
20 6000, they look at both the dose to the hands  
21 and arms and to the skin other than the hands  
22 and arms. The numbers that David presented

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1 are those related to the skin other than the  
2 hands and arms. We also took a quick look,  
3 and, again we haven't finished this, but I  
4 think what I'm saying is going to be the way  
5 it's going to end up.

6 We took a quick look at the hands  
7 and arms using a similar methodology, and used  
8 a film badge to organ correlation that was in  
9 one of the NIOSH documents to convert the film  
10 badge dose, if you will, to what the hands and  
11 arms were experiencing.

12 And the same -- one can draw the  
13 same conclusion, that the TBD-6000 numbers for  
14 the hands and arms are also conservative. The  
15 only underlying concern we have is that TBD-  
16 6000 is really not prescriptive as to what you  
17 do, whether you take the median and the  
18 distribution, or whether you take the 95th  
19 percentile, or what metric do you use to --  
20 for your analysis.

21 It is clear from David's White  
22 Paper and the studies that we have done that

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1 the median does not capture it. The 95th  
2 percentile does. Probably the arithmetic mean  
3 does, but the median does not. So as far as  
4 we're concerned, the issue is that one needs  
5 to be prescriptive in the use of this in order  
6 to get a bounding dose, and I think that's  
7 about it.

8 DR. MAURO: There's one more --  
9 Bill, you made a -- pointed something out to  
10 me that was interesting, in the distinction  
11 between TBD-6000 and the kind of things you do  
12 with that kind of facility, and TBD-6001 and  
13 the types of things, and where the Puzier  
14 effect may or may not emerge.

15 MR. THURBER: Yes. The case that  
16 was analyzed for TBD-6000 -- I'm sorry, the  
17 operator class that was analyzed for TBD-6000  
18 by David Allen and the work that we did, is a  
19 guy that's involved in scrap recovery, and  
20 presumably the scrap recovery process involves  
21 the remelting of scrap from wherever,  
22 converting it back into an ingot that can then

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1 be subsequently refabricated by rolling or  
2 extrusion or whatever.

3 In TBD-6001 you have basically the  
4 same issue for the fabrication operations,  
5 where the derbies are taken and remelted in  
6 vacuum induction furnaces and recast into  
7 billets for subsequent fabrication.

8 But the specific analysis that  
9 we're talking about here is relevant only to  
10 -- the specific numbers we're talking about  
11 here are relevant only to TBD-6000. The same  
12 methodology may be applicable to 6001. I  
13 don't know.

14 CHAIRMAN ZIEMER: Okay. Thanks  
15 for those additional comments. While we're  
16 discussing the White Paper and the SC&A  
17 comments, let me also raise a couple of  
18 questions that we received from the  
19 petitioner, and Dan McKeel, if you're on the -  
20 - I think you're on the line, you'll be  
21 welcome to jump in here if you need to.

22 But Dan's first point was that the

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1 information about what was used in the Puzier  
2 report is not clear. He asked what does  
3 Puzier indicate would be delivered by the  
4 contaminating recast uranium-234 and  
5 protactinium-234m crust contaminants of  
6 uranium ingots. Is Puzier the only literature  
7 that addresses thorium and protactinium  
8 accumulation in uranium ingots? I don't know  
9 if either of you has a response to that.

10 But was there a particular part of  
11 the Puzier report that --

12 MR. ALLEN: I think it was a  
13 paragraph in there or a couple of paragraphs.

14 DR. ANIGSTEIN: As a matter of  
15 fact, I thought we had given Dr. McKeel the  
16 references, specific page numbers at the last  
17 meeting.

18 MEMBER MUNN: Yes, you did.

19 CHAIRMAN ZIEMER: I thought we had  
20 two --

21 MEMBER MUNN: There were only 11  
22 pages of the report.

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1 DR. ANIGSTEIN: There were two  
2 pages actually.

3 CHAIRMAN ZIEMER: A couple pages.  
4 We'll try to track that down. Dan --

5 DR. McKEEL: That wasn't really  
6 the thrust of my question. The thrust of the  
7 question was that the pages were mentioned.

8 But what's not mentioned in the  
9 White Paper or any of this discussion, when I  
10 look back over the March 11th Work Group  
11 meeting, when Dr. Neton said that this issue  
12 needed to be elaborated upon, I haven't seen  
13 the doses that actually get delivered by the  
14 Puzier effect.

15 That's what's not written into the  
16 documents that I can see, and it seems to me  
17 that if you're talking about the Puzier  
18 effect, you need to be actually giving the  
19 dose that this would deliver. So that was  
20 really my question, not what pages of the  
21 report apply.

22 CHAIRMAN ZIEMER: Okay. Hang on

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1 just a second here.

2 DR. ANIGSTEIN: This is Bob  
3 Anigstein.

4 CHAIRMAN ZIEMER: Bob has the page  
5 here.

6 DR. ANIGSTEIN: In the report, in  
7 Puzier's report, which has these two different  
8 paginations, the typed page is 26 and then  
9 there's a handwritten page 42 on top of the  
10 same page.

11 I'll just read from -- two  
12 sentences from the report. "We used to use,  
13 as a rule of thumb, clean uranium metal in  
14 equilibrium with at least its first two  
15 daughters would give off on the order of 200  
16 mrad per hour beta radiation at the surface of  
17 a piece of metal.

18 "This went up by at least an order  
19 of magnitude and probably more than that. We  
20 can say we saw readings as high as 2,000 to  
21 3,000 mrad per hour on castings of depleted  
22 uranium that were in the foundry area."

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1                   Then he goes on to say -- so that  
2 becomes a factor of 10 to 15 higher.

3                   DR. McKEEL:     Well, Bob, that's  
4 exactly my point, that those numbers, two to  
5 three thousand millirads per hour of depleted  
6 uranium, which really is a small part of what  
7 was used, you know, as far as uranium ingots  
8 at many AWE facilities, I think those numbers  
9 need to be in the White Paper and TBD-6000.  
10 That's really my point. I think that's fine  
11 to have that data, but you need to mention the  
12 numbers.

13                  DR. MAURO:     Dan, that's exactly  
14 the point that we were discussing a moment  
15 ago, namely one of our comments. One of --  
16 this is John Mauro.

17                  MR. ALLEN:    Yes.

18                  DR. MAURO:    One of SC&A's comments  
19 on TBD-6000 is it's silent regarding the  
20 Puzier effect, and that's, you know, there's a  
21 need to address if in fact you encounter a  
22 site or a case where there's reason to believe

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1 a worker may have been handling a freshly-  
2 reduced uranium ingot, it's important to take  
3 into consideration that the exposure rates  
4 that he might experience would be, could be,  
5 both beta and gamma, could be 10 to 15 times  
6 higher for some period of time.

7 As you know, it does decay away.  
8 I think it has a 29 day half life.

9 CHAIRMAN ZIEMER: Twenty-four.

10 DR. MAURO: Twenty-four day half  
11 life. So, yes, we agree with you, and I  
12 believe NIOSH would agree, yes, you know,  
13 there needs to be something to be said. What  
14 we were just discussing a moment ago is, you  
15 know, how is that to be addressed.

16 I think David Allen made a very  
17 good point, that says, listen, the  
18 distribution of external doses in TBD-6000,  
19 the upper 95th percentile, more than accounts  
20 for the existence of that." But then it  
21 becomes a practical matter.

22 Okay. You've got a real case.

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1 How are you going to do the dose if you think  
2 the person may have a Puzier effect? Are you  
3 going to stick with the 50th percentile, or  
4 are you going to use some high end of the  
5 distribution in TBD-6000.

6 So I think we're all in agreement,  
7 and it really is a matter of judgment to be  
8 made. When that situation arises, what do you  
9 do?

10 DR. McKEEL: My additional Point 3  
11 related to the fact that, you know, recasting  
12 depleted uranium scrap is one thing that went  
13 on at the AWE sites, but as was mentioned for  
14 TBD-6001, a much more common thing to do was  
15 to remelt derbies into ingots, or what is left  
16 out of TBD-6000 altogether is the process  
17 patented at Mallinckrodt and used at Weldon  
18 Spring, which was the direct casting of ingots  
19 in a bomb, which left a thick magnesium  
20 fluoride crust around ingots which had to be  
21 removed with a lathe.

22 So those two complimentary

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1 situations with thorium-234 and protactinium-  
2 234 may also rise to the outer surface of the  
3 crust. That's not covered at all, and it  
4 seems to me that that should be. So I wanted  
5 to put that on the table as well, that the  
6 case cited in this discussion is really a  
7 very, very limited one of remelting scrap.

8 CHAIRMAN ZIEMER: Okay, thank you.

9 MR. THURBER: But I think -- this  
10 is Bill Thurber -- isn't it correct to say  
11 that if some of those factors are added to the  
12 discussion of, in TBD-6000, which everyone has  
13 agreed needs to be expanded upon, that the net  
14 result might be to increase the median and the  
15 95th percentile for this particular operation.

16 But then when you compare it with  
17 the real world numbers, you're still going --  
18 the real world numbers are still going to show  
19 that you are very -- you're even more  
20 conservative.

21 DR. McKEEL: Well my comment would  
22 be I don't think you're really showing the

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1 real world numbers because what you don't have  
2 is data that you can clearly point to of  
3 workers that were working with, as you say,  
4 freshly-cast ingots. What you really have is  
5 a huge conglomerate of film badge readers  
6 reading from various sites, you know.  
7 ElectroMet, Mallinckrodt for now have been  
8 mentioned. But those are all diluted out.

9 Let's say that the people who  
10 worked with recast scrap metal ingots and were  
11 exposed to thorium-234, what you need is data  
12 from people like that made directly from  
13 those, and know what their film badges read.

14 So to say that the entire mix of  
15 Fernald badges represents that particular  
16 group of people who may have much higher  
17 doses, I think, is just -- is flawed. It's  
18 like the healthy worker effect, you know. In  
19 epidemiologic studies, if you compare a highly  
20 at-risk population with all young workers,  
21 let's say, in an industry, obviously the  
22 health, you know, they're going to have a

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1 skewed distribution.

2 So I don't think we're really -- I  
3 don't think there is any real good  
4 representative data from workers working with  
5 freshly-recast uranium that has thorium-234 at  
6 the surface. I think that's not an accurate  
7 portrayal of what you're actually working  
8 with. So that was another major thrust of my  
9 point number 2 that I made to the White Paper.

10 CHAIRMAN ZIEMER: My understanding  
11 is that NIOSH is not using the film badge data  
12 in this case for that purpose; correct?  
13 You're using, you're using this model for the  
14 --

15 MR. ALLEN: TBD-6000 has a model  
16 dose rate, and the intent of the short White  
17 Paper I wrote was to say that in the real  
18 world application our model is conservative,  
19 and SC&A has agreed that on the 95th  
20 percentile, it certainly seems to be  
21 conservative.

22 CHAIRMAN ZIEMER: Right, and

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1 Puzier's values were not based on film badge  
2 reading; correct? They're based on actual  
3 measurements at the surface of uranium, not --  
4 and that's what you're using. You're not  
5 using --

6 DR. McKEEL: The Fernald data that  
7 is quoted in the table on the last page of the  
8 White Paper, that's film badge data, right?

9 MR. ALLEN: Yes, that's film badge  
10 data.

11 DR. McKEEL: Okay. Well, that's  
12 what I'm saying. That's comparing -- that's  
13 not comparing exactly the same thing. That  
14 was my point.

15 MR. ALLEN: Well, it has -- the  
16 only thing it has in there is dose rate data,  
17 millirem per hour or....

18 CHAIRMAN ZIEMER: -- measurements,  
19 not from dosimetry.

20 MR. ALLEN: Right, and we only use  
21 those kind of measurements are is to then  
22 assume some amount of time somebody was

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1 exposed to that, and multiply it by time.  
2 Whereas the film badge data is integrated over  
3 that, it takes it all into account in the real  
4 world. The idea that Dr. McKeel mentioned as  
5 far as diluting this effect with a large  
6 population, us not also doing that is the  
7 reason in the White Paper I compared the  
8 maximum to the 95th, the TBD-6000 numbers.

9 As far as real world doing this  
10 sort of recasting operation, Fernald produced  
11 hundreds of metric tons of uranium using this  
12 recast method for many decades. There is no  
13 other facility in the world that produced this  
14 kind of -- at least in the United States, that  
15 did more uranium recasting than Fernald did.

16 MR. THURBER: David, this is Bill  
17 Thurber. I'm not sure that everyone  
18 understands what I think you did, and that was  
19 you looked at 124,000 pieces of film badge  
20 information and you took the single highest  
21 value.

22 MR. ALLEN: Correct.

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1                   MR. THURBER: So there was nothing  
2 higher than that. So your comparison metric  
3 of 52 rem or whatever it was, is not something  
4 that is diluted by other measurements. It is  
5 the single highest measurement at Fernald over  
6 a large number of years; is that correct?

7                   MR. ALLEN: That's correct.

8                   MR. THURBER: Okay.

9                   MR. RAMSPOTT: Dr. Ziemer?

10                  CHAIRMAN ZIEMER: Yes.

11                  MR. RAMSPOTT: This is John  
12 Ramspott. May I ask Bill Thurber and David  
13 Allen a question?

14                  CHAIRMAN ZIEMER: Sure.

15                  MR. RAMSPOTT: I think Dr. McKeel  
16 made this point a minute ago. I just want to  
17 make sure it's not being missed. David, did  
18 you not say your White Paper was based on  
19 Fernald and recast ingots?

20                  MR. ALLEN: It was based on all  
21 the data at Fernald, which includes much more  
22 of the recasting.

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1                   MR. RAMSPOTT:    Much more of the  
2    recasting,   okay,   and   Bill,   is   there   a  
3    difference,   in   your   opinion,   of   recast   versus  
4    virgin   dingots   or   ingots   using   the  
5    Mallinckrodt   process?    Would   there   be   a  
6    difference?

7                   MR. THURBER:    I wouldn't think so.  
8    What I understand is happening, and I don't  
9    understand the details of why it's happening.  
10   I know there's some publications about why  
11   this concentration on the surface occurs. I  
12   don't understand them. I'm not sure they're  
13   correct.

14                   But regardless of that, what I do  
15   understand is that, when you remelt uranium,  
16   if you have thorium-234 and protactinium-234,  
17   and in the uranium ingot, which you will, that  
18   when you recast it, some of it moves to the  
19   surface. So if you recast it ten times, some  
20   of it's still going to move to the surface.

21                   So there is no difference between  
22   casting and recasting in my view as to the

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1 fact that the phenomenon occurs.

2 MR. RAMSPOTT: The reason I was  
3 asking is David's is based on recast from  
4 Fernald; Mallinckrodt was doing very little  
5 recast, which I'm going to send this Work  
6 Group an email, if I may.

7 It's a Mallinckrodt purchase order  
8 and it shows that recast was a fraction, a  
9 fraction, 30 times different than virgin  
10 ingots and dingots.

11 This was a 1954 purchase order  
12 that I'm looking at right now, which is in, I  
13 believe, Appendix BB. It's part of the  
14 documents for that site.

15 So if we're comparing apples with  
16 oranges, and the reason I'm saying apples with  
17 oranges is, if I understood John Mauro and  
18 some other people earlier, there's a time line  
19 involved with, I guess, the thorium, a half-  
20 life of like 20-30 days or what have you.

21 But if you're putting a whole  
22 different step in there, which is apparently

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1 what they're doing at Fernald, I mean they're  
2 not doing at Fernald or they are doing at  
3 Fernald. They're recasting, we're comparing  
4 apples with oranges, I thought.

5 (Simultaneous speakers.)

6 DR. ANIGSTEIN: John, your  
7 question is very well put. If I can sort of  
8 try to succinctly explain the phenomena,  
9 uranium under normal conditions, under  
10 undisturbed conditions, is always in  
11 equilibrium with its daughters: thorium 234  
12 and protactinium-234m.

13 It doesn't matter -- it's uranium  
14 238. It doesn't matter whether you have  
15 natural uranium or depleted uranium. There is  
16 a very tiny difference in the amount of U-238.

17 CHAIRMAN ZIEMER: That is true.

18 DR. ANIGSTEIN: One is 99.3  
19 percent and the other one's maybe 99.8  
20 percent. There's all or virtually all U-238.

21 So whether it's recast or virgin is not the  
22 issue. The issue is that the melting process

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1 of the uranium metal, you start off with the  
2 thorium distributed uniformly throughout the  
3 uranium.

4 When you melt it, the thorium  
5 comes to the surface and stays there with a  
6 half-life of 24 days. Then every 24 days,  
7 half of it decays but it's replaced by the  
8 thorium roaming in throughout.

9 So when you start off with freshly  
10 cast uranium, you'll have this 10- to 15-fold  
11 concentration on the surface. That decays, it  
12 grows in in the middle.

13 So after a few months, you have  
14 uniform distribution. But whether it's from  
15 virgin or whether it's scrap or however way  
16 it's produced, the effect is essentially the  
17 same. Is that clear?

18 DR. McKEEL: Well, I understood  
19 they were dealing with two different types.  
20 Apparently, Fernald's based on recast. That's  
21 why I asked the question.

22 DR. ANIGSTEIN: I mean, but this

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1 Puzier effect will be the same for all of  
2 them.

3 DR. McKEEL: It would be the same  
4 for both, is what you're saying.

5 DR. ANIGSTEIN: That's right, yes.

6 DR. McKEEL: Can I ask another  
7 question then? Since the Puzier effect,  
8 apparently everybody agrees it's there.

9 DR. ANIGSTEIN: Yes.

10 DR. McKEEL: Would the betatron  
11 hitting at thorium make a difference, since  
12 Fernald, I think we all found out probably  
13 didn't have a betatron.

14 DR. ANIGSTEIN: The answer is no,  
15 because the betatron beam doesn't look at --  
16 there's a big difference between activity and  
17 number of atoms. The number of atoms of  
18 thorium on the surface is insignificant.

19 It just happens to be -- they are  
20 very hot, so they contribute a lot to the  
21 external dose. But as far as the reaction  
22 with the betatron beam, there is none.

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1 DR. McKEEL: There's no difference  
2 when a betatron beam hits thorium and when it  
3 hits uranium.

4 DR. ANIGSTEIN: Yes. There is no  
5 enhanced effect, because you have for every  
6 thorium atom, you have literally billions of  
7 uranium atoms. So the betatron beam effects,  
8 you know, hits each one, but it's a very, very  
9 --

10 CHAIRMAN ZIEMER: So you're saying  
11 the contribution to the output or the  
12 interactions from the betatron with respect to  
13 thorium are trivial.

14 DR. ANIGSTEIN: Exactly.

15 CHAIRMAN ZIEMER: The issue here  
16 is that of the surface radiation level of  
17 terms of handling or proximity to it?

18 DR. ANIGSTEIN: That is correct.

19 DR. MAURO: There's something that  
20 I could add that might -- when I was looking  
21 at the results, I asked myself a common sense  
22 question. I said, okay, NIOSH's analysis

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1 says, listen, the upper 95th percentile number  
2 in TBD-6000 for the annual dose to the hands,  
3 that you estimate from TBD-6000, is 3,250 rem,  
4 okay.

5 I said, okay, and that's what you  
6 -- if you were to go and take TBD-6000 and say  
7 I'm going to use the 95th percentile for a guy  
8 that works at a facility where he's handling  
9 an ingot, all right, that has the Puzier  
10 effect. I say, you know, that's the number  
11 that would be assigned.

12 Then I ask myself okay, knowing  
13 what I know about the Puzier effect, I know  
14 that the contact dose from regular uranium,  
15 not with the Puzier effect, is about 200  
16 millirem per hour. You may want to write this  
17 down. It's about 200 millirem per hour.

18 But then if there's the Puzier  
19 effect, it's going to be maybe ten times  
20 higher than that, okay. So now, instead of  
21 being 200 millirem per hour at the surface,  
22 it's 2,000 millirem per hour at contact. Then

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1 I multiply by 2,000 hours per year. Okay, as  
2 if the guy was holding onto it, 2,000 hours  
3 per year.

4 Of course, he's not doing that.  
5 But if he was, you'd get 4,000 -- you'd end up  
6 with 4,000 rem, okay, in the year.

7 MEMBER POSTON: On the surface. I  
8 just want to make that clear.

9 DR. MAURO: Contact dose, contact  
10 dose. Now so what I'm saying is under the  
11 most absurd, extreme assumptions that a guy is  
12 sort of hugging this Puzier ingot, 2,000 hours  
13 per year and you get 4,000 rem. But TBD-6000  
14 is assigning 3,250. Now what that tells me is  
15 3,250 is a pretty good number, okay.

16 I mean that sort of like cleans  
17 away all of the -- you know, it's easy to get  
18 caught up in the woods in these things. It  
19 says that that upper bound of 3,250 at the  
20 95th percentile is off-the-charts high. Now  
21 if that hard to say --

22 MEMBER GRIFFON: John, can I step

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1 into this. This is Mark Griffon. We need the  
2 --

3 (Simultaneous speakers.)

4 DR. MAURO: The dose to the hands  
5 and arms for TBD-6000, the 95th percentile  
6 value.

7 MEMBER GRIFFON: Hands and arms.

8 DR. MAURO: You got it. This is  
9 the contact dose. The contact dose at the  
10 95th percentile level in TBD-6000 is 3,250 rem  
11 per year. That's the number that they're  
12 recommending. Now they didn't do --

13 DR. ANIGSTEIN: If I can  
14 interrupt, interject.

15 DR. MAURO: Sure.

16 DR. ANIGSTEIN: I'm just  
17 supporting your comment. The Puzier actually  
18 says it could be as high as 3,000 mrad an  
19 hour, and TBD-6000 makes the assumption, the  
20 conservative assumption, that the worker is in  
21 contact with the uranium half the time. So  
22 now we're getting 1,000 hours a year and

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1 possibly 3,000 millirads per hour. So there  
2 we go exactly; you've got 3,000 rem per year,  
3 which confirms exactly what -- the 3,250 is a  
4 good number.

5 MEMBER MUNN: It's an extremely  
6 high number.

7 DR. MAURO: It is a high number.

8 CHAIRMAN ZIEMER: Now your  
9 question, John, I guess SC&A's question is  
10 whether or not the 95th percentile is always  
11 used or what are the other options for the --  
12 for evaluating a claim. Dave, could you  
13 clarify that?

14 MR. ALLEN: Like I said earlier,  
15 the TBD-6000 now says to give a distribution,  
16 period, out of that table. The GSD is five.  
17 The mean values are in the table. I think  
18 John just pointed out that the 95th percentile  
19 is pushing the realms of implausibility.

20 DR. MAURO: But on the other  
21 extreme, I also want to say I'm not too happy  
22 with the median.

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1                   MR. ALLEN: Well, I don't -- Bill  
2                   Thurber, he's on the phone. He mentioned  
3                   something earlier about the median was not  
4                   necessarily covered with the TBD-6000.

5                   MR. THURBER: No. The median for  
6                   the skin, other than the hands and arms, that  
7                   goes with the 294 rem per year, 95th  
8                   percentile value in your White Paper, the  
9                   median is 21, and obviously -- 21 rem per  
10                  year, and obviously, 21 rem per year is  
11                  substantially lower than the empirically  
12                  determined 52 rem per year from the Fernald  
13                  data.

14                  So you know, it's our position  
15                  that the median value is not appropriate if  
16                  you want to be sure that you're covering the  
17                  surface concentration of these uranium  
18                  progeny.

19                  MR. ALLEN: That's the point I  
20                  wanted to get at here because I think that's  
21                  the one disagreement we have at this point.  
22                  Other than that, I think we're close to

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1 closing this issue.

2 MR. THURBER: Yes.

3 MR. ALLEN: That's the answer I  
4 don't understand.

5 CHAIRMAN ZIEMER: What does the  
6 dose reconstructor, when you say he can use  
7 the distribution, what --

8 MR. ALLEN: He assigns the roughly  
9 21 rem as the geometric mean of a log-normal  
10 distribution with a GSD of five.

11 CHAIRMAN ZIEMER: For some people  
12 or all people?

13 MR. ALLEN: That would be for a  
14 skin dose other than hands and arms.

15 MR. THURBER: For all people.

16 MR. ALLEN: Yes, if we're  
17 assigning a skin dose.

18 MEMBER MUNN: Other than hands and  
19 arms?

20 MR. ALLEN: If it was hands or  
21 arms, we assigned the larger number.

22 DR. MAURO: You'd assign 230.

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1                   MR. THURBER:     230, right, plus  
2     with a standard deviation of five, and in our  
3     view, that does not capture the possibility  
4     that the worker is going to have exposure to  
5     uranium     shapes     that     have     surface  
6     concentrations     of     thorium-234     and  
7     protactinium-234m.

8                   MR. ALLEN:     I guess the part I'm  
9     not quite understanding is I thought you had  
10    said you didn't think it was covered. Are you  
11    saying it just wasn't analyzed in the White  
12    Paper?

13                  MR. THURBER:     Oh no, no, no.  
14    Those metrics, we don't feel are appropriate,  
15    because the maximum is greater. That's what I  
16    meant by covered. No, no. It's not that your  
17    --

18                  DR. ANIGSTEIN:    In other words,  
19    they're not -- it's not claimant-favorable.

20                                   (Simultaneous speakers.)

21                  MR. ALLEN:     Because the maximum  
22    is, the maximum dose out of 120-some thousand

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1 is greater --

2 MR. THURBER: It's greater than  
3 the median.

4 MR. ALLEN: Two and a half times  
5 the median.

6 MR. THURBER: Right.

7 DR. NETON: I want to ask a  
8 question, here.

9 CHAIRMAN ZIEMER: That's -- Dr.  
10 Neton.

11 DR. NETON: Has nothing to do with  
12 the Fernald data, but about the distributions  
13 being applied. Is it correct that it's a 21  
14 with a GSD of five that arrives at a 296 95th  
15 percentile? Is that what the number was?

16 MR. THURBER: Yes.

17 MR. ALLEN: Yes.

18 DR. NETON: And the highest value  
19 of 125,000 badges measured at Fernald was  
20 something like 50 or 51?

21 MR. ALLEN: 52.

22 DR. NETON: It's not intuitively

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1 obvious to me that assigning that distribution  
2 wouldn't result in a higher PC calculation  
3 than assigning 51 as a constant because you're  
4 sampling that distribution and the PC is  
5 calculated at 95th percentile, in a large  
6 portion of time, you're going to be using the  
7 high end value of that distribution. So I'm  
8 not sure that it's a given that that  
9 distribution is low.

10 MR. THURBER: Well, it's a  
11 question of assigning 21 with a GSD of five or  
12 294, I think.

13 DR. NETON: No, no. I'm saying  
14 it's a model distribution that is exactly  
15 that. The 21 value, we'd have to go back into  
16 the derivation of that value. But we allow  
17 for the fact that it could be as high as 296  
18 when you sample that log-normal distribution.

19 If what we're saying is 51 is the  
20 highest ever observed in any employee working  
21 with this type of metal, then one would come  
22 to the conclusion maybe 51 as a constant is

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1 the right value. It's not clear to me that  
2 that would produce in a higher PC value than  
3 what we're currently using.

4 DR. ANIGSTEIN: SC&A did a report  
5 way back, I think in 2004, comparing for  
6 given, for certain hypothetical GSDs, what is  
7 the effect of using the entire distribution,  
8 and what is the effect of using the 95th  
9 percentile?

10 The answer is it depends. There  
11 are some cases -- in most cases, using the  
12 95th, the fixed value of the 95th percentile  
13 is the more favorable, claimant-favorable.

14 DR. NETON: Well, it depends on --

15 DR. ANIGSTEIN: We thought at one  
16 time that NIOSH OCAS had accepted that.

17 MR. ALLEN: Yes, but we're talking  
18 about -- I think Jim's point is it seems -- it  
19 would seem this comparison is legitimate, that  
20 it would be legitimate to assign the 52 rem as  
21 a constant, and that's nowhere near the 95th  
22 percentile of the distribution we'd be

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1 assigning. It's well below the 84th  
2 percentile.

3 DR. ANIGSTEIN: I guess the only  
4 way you could really test it is to make up a  
5 hypothetical case and run IREP, and see which  
6 one comes out higher.

7 DR. MAURO: You've got a little  
8 bit of a dilemma. Let me explain a little bit  
9 of a dilemma. In the original TBD-6000, in  
10 order to create, have your construct, you said  
11 okay, what we'll do is we're going to assume  
12 the worker spends 50 percent of his time in  
13 direct contact with the uranium, where the  
14 direct contact gives you 200 millirem per  
15 hour, and you come up with a number.

16 Then you get -- then you made some  
17 other assumptions for the distribution. Now  
18 the reality is, and I'm not saying you should  
19 do this, don't get me wrong; the reality is if  
20 you were to apply to those same assumptions  
21 regarding the distribution on occupancy and  
22 close proximity to uranium, but now it's not

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1 uranium, regular old uranium, it's Puzier  
2 uranium. Well then all of the sudden, the  
3 doses go -- so what really happened here is  
4 that when you originally did TBD-6000, you  
5 made a bunch of what you would consider to be  
6 reasonably conservative assumptions, assuming  
7 you were operating with regular old uranium.  
8 Along comes the Puzier effect and you ask  
9 yourself the question, well, we're not going  
10 to just replace the regular old uranium and  
11 now we're going to put Puzier in there because  
12 then everything goes off the charts, and it  
13 wouldn't be right.

14 So what you'll say is let's see if  
15 the approach you did use with its inherent  
16 assumptions in its own way is conservative  
17 enough when you start to look and compare the  
18 outcome to the real world, with -- and I would  
19 agree with you 100 percent that going to  
20 Fernald and looking at the data there is a  
21 good way to say "Listen, are our assumptions  
22 so conservative that it even catches the upper

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1 end of the real world," and the answer is it  
2 does.

3           So I mean I'm not saying you  
4 should replace, you know, the Puzier ingot,  
5 replace the regular ingot with the Puzier  
6 ingot and use the same assumptions that you  
7 did to get these distributions. I agree that  
8 the upper end of the distribution in TBD-6000,  
9 using the approach you've used, does just so  
10 happen, more of an account for the Puzier  
11 effect, and the only question we have is that  
12 I don't, you know, and maybe the answer is  
13 what you just said.

14           The only question I have is that  
15 well, if you go into this problem and you're  
16 doing a guy who you do know worked with a  
17 Puzier ingot, and you used the geometric mean  
18 and standard deviation as laid out in TBD-6000  
19 as it currently is, is it possible you're  
20 going to underestimate his dose, as compared  
21 to using some fixed value at the high end of  
22 the distribution?

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1           Our sense is that yes, you  
2 probably would get a claimant-favorable and  
3 appropriate dose if you know, if you assign  
4 something in the upper end of the distribution  
5 in TBD-6000, not the full distribution. But  
6 your just saying no, that may not be the case.

7       It may turn out the full distribution is more  
8 limiting than the upper 95th percentile  
9 deterministic. I don't know --

10           DR. NETON:       And I think the  
11 problem with that is I don't think it's  
12 knowable because it's very case-specific, as  
13 Bob mentioned. I mean the risk models that  
14 are used and all the factors that go in there,  
15 it really comes down to how much is the  
16 uncertainty about the dose estimate driving  
17 the 99th percentile of the PC, versus all the  
18 other factors that are in there, which are  
19 latency period corrections and all kinds of  
20 things. So but I'm saying --

21           DR. MAURO:    I don't want to shift  
22 into the PC part. I mean I was just thinking

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1 with the --

2 DR. NETON: Well, but my point is,  
3 though, the distribution, in some cases, it  
4 seems to me that this distribution might  
5 produce higher PCs than assigning a 51 rem  
6 value.

7 DR. ANIGSTEIN: But not assigning  
8 the 95th percentile of the distribution.

9 DR. NETON: Correct. That's my  
10 point, yes.

11 MR. THURBER: Well, let me just --  
12 this is Bill Thurber. I would also say that  
13 while the -- I'm sorry, the 52 rem empirical  
14 number is certainly well substantiated with  
15 the Fernald data, before you would pick an  
16 empirical number, I think you need to look at  
17 Mallinckrodt information and ElectroMet and  
18 whoever else was doing this kind of work to be  
19 sure that 52 rem did capture this empirical  
20 maximum.

21 So I would think that rather than  
22 saying one can go to an empirical maximum, one

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1 ought to stick with the statistical  
2 distribution that's available and decide what  
3 the proper metric is. Remember, we're only  
4 talking in the case of TBD-6000 for the scrap  
5 recovery guy.

6 We're not talking about, I don't  
7 think we are anyway, all the other jobs that  
8 are covered by TBD-6000, machining, rolling,  
9 forging, extrusion, slug canning, whatever.

10 DR. NETON: Well, I'm not sure. I  
11 mean --

12 MEMBER POSTON: Well, where does  
13 logic come in? Let me finish my statement. I  
14 mean we're talking over 200 rem, 250, 260, I  
15 don't know what the number was. I mean from a  
16 radiobiological standpoint, wouldn't you  
17 expect --

18 DR. MAURO: Damage.

19 MEMBER POSTON: Yes.

20 DR. MAURO: You get damage.

21 MEMBER POSTON: Yes, and so I mean  
22 is it reasonable to assign such a high dose?

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1 It's totally ludicrous.

2 DR. MAURO: But I'll tell you  
3 what's not reasonable. What's not reasonable  
4 is to build a TBD-6000 that says here's the  
5 protocol we're going to use, and it's all  
6 built around regular old pure uranium, and you  
7 felt that this is a reasonable thing to do,  
8 and we agree. If you're dealing with just  
9 regular uranium --

10 DR. ANIGSTEIN: Or old uranium.

11 DR. MAURO: Or old uranium,  
12 without the Puzier effect --

13 MEMBER POSTON: It's all old.

14 DR. MAURO: And you know, yes,  
15 it's real old.

16 (Simultaneous speakers.)

17 DR. MAURO: Stay with me. So but  
18 then all of the sudden you get a monkey wrench  
19 thrown into the picture. Well holy mackerel,  
20 you know, we didn't -- all of the sudden you  
21 have a Puzier thing going on.

22 And you're saying well, we don't

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1 care. The Puzier thing doesn't change --  
2 well, no, of course it changes things. All of  
3 the sudden you're telling the world that when  
4 we originally designed and implemented TBD-  
5 6000, it was all built around the assumption  
6 that it was uranium without this enrichment of  
7 the thorium in the crust.

8 Now we recognize that that only  
9 occurs under very special circumstances, and  
10 for a relatively short period of time. So the  
11 only question we raise is that when all of a  
12 sudden that new scenario steps into the  
13 picture, it's self-evident that somehow you  
14 have to take that into consideration.

15 You just can't go ahead and use  
16 the same models you were using before, before  
17 you realize we've got this new thing in the  
18 game now. So something has to be done to deal  
19 with this new thing in the game.

20 MR. ALLEN: But I think that it is  
21 reasonable to throw conservative assumptions  
22 in there that can't account for smaller

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1 effects. From what we're seeing with this  
2 data and I think from what Bill saw with some  
3 Mallinckrodt and from Simonds Saw or I can't  
4 remember --

5 DR. MAURO: ElectroMet.

6 MR. ALLEN: Was that we have  
7 accounted for this effect, and the difference,  
8 if you wanted to account for the difference of  
9 this effect versus the normal uranium, would  
10 be to lower the remaining doses.

11 As it stands right now, the  
12 highest Fernald dose ever was the 52 rem. The  
13 median of the roughly 21 rem. I think there  
14 are maybe 20 or 30 annual doses throughout the  
15 history of Fernald that were above that.

16 So our median is way up there high  
17 on the Fernald distribution, and 20 or 30  
18 annual doses when you were doing this  
19 operation for over 30 years, means these are  
20 probably the high guy each year for those  
21 years.

22 DR. ANIGSTEIN: But ElectroMet is

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1 almost twice as high. The maximum at  
2 ElectroMet is almost twice as high as the  
3 maximum at Fernald.

4 MR. ALLEN: What is the maximum at  
5 ElectroMet?

6 DR. ANIGSTEIN: It's 95.

7 MR. ALLEN: And I can go and look  
8 at all those, et cetera, but you're talking  
9 about the maximum now of the country, because  
10 you're talking about Fernald, Mallinckrodt,  
11 ElectroMet. We're looking at a median that is  
12 a fifth of that. We're looking at a median in  
13 the 84th percentile of the distribution we're  
14 assigning.

15 I mean it seems to me from what we  
16 were talking earlier, I can assign that 99th  
17 as a constant, like Jim said. I'm not so sure  
18 that's going to be more favorable. That's  
19 with the Puzier effect, and we're assigning  
20 that for all the uranium.

21 So the argument really seems to be  
22 that we should have a difference, and we

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1 should be lowering the remaining doses.

2 DR. MAURO: You know, I can agree  
3 with that. That is, if in fact the set of  
4 assumptions that we used originally weren't so  
5 conservative. You see the reason this  
6 happened is --

7 MR. ALLEN: Well, that was my point  
8 with the White Paper is I think we've already  
9 covered all the conservative assumptions.

10 DR. MAURO: It was almost like an  
11 artifact, and you adopted an extremely  
12 conservative approach to the regular uranium,  
13 and the outcome of it is gee, that's so  
14 conservative it could even account for the  
15 Puzier effect.

16 Then you said to make my case, I'm  
17 going to show you that I take the highest  
18 number out of thousands of readings in the  
19 real world where there's, you know. And the  
20 95th percentile is even higher than that.

21 That's very compelling. So that's  
22 -- but then that brings us back, and all that

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1 is very powerful argument. But then that  
2 brings us back, and this is really a judgment  
3 call. Is it okay to simply use the geometric  
4 means in the full distribution to apply to  
5 workers, whether they work with the Puzier  
6 effect or not? That's basically what you're  
7 saying.

8 Does it matter? If it's a guy  
9 that wasn't working with Puzier effect, you're  
10 going to be -- he's a little bit more  
11 conservative. You're really probably giving  
12 him too much dose. If it's with the Puzier  
13 guy, well you know, it's probably okay for him  
14 but --

15 You see, to me there's enough  
16 difference. We're talking a tenfold  
17 difference in the field, and it's hard for me  
18 to accept that nothing special has to be done  
19 here. I would say it was two, yes, but we're  
20 talking 10 to 15-fold differences, and it  
21 doesn't have an effect.

22 CHAIRMAN ZIEMER: Well, but can

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1 you distinguish between who those folks are  
2 anyway?

3 DR. NETON: Probably not.

4 CHAIRMAN ZIEMER: And if you  
5 can't, you use the Puzier effect.

6 DR. MAURO: Well, but they're not.

7 CHAIRMAN ZIEMER: Well, you  
8 haven't, but --

9 MR. ALLEN: Well in reality most -  
10 - there's not a lot of facilities out there  
11 that melt uranium and didn't do several other  
12 operations, but we never knew where the person  
13 worked, so --

14 DR. MAURO: And I agree with that.  
15 I agree with that, yes. I mean I agree with  
16 that. I would say that the likelihood the  
17 guy's going to spend a lot of time hugging a  
18 Puzier ingot is pretty small. Except maybe,  
19 except by the way, except maybe at a GSI.  
20 We're going to get to GSI later.

21 CHAIRMAN ZIEMER: Well just in  
22 general terms, and we'll talk about GSI

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1 specifically at that point, but in general  
2 terms, on TBD-6000, would you -- are you  
3 proposing to include the Puzier effect, as  
4 you've described it here, or in the original  
5 model?

6 MR. ALLEN: What I was proposing  
7 originally, before we clarified at the last  
8 meeting, was to add some language to describe  
9 this, and to -- on this White Paper, and I  
10 think even from what Bill's written up, is to  
11 indicate that the conservative assumptions in  
12 TBD-6000 have this covered, leave the numbers  
13 as they are. I can't see how it can possibly  
14 account for the Puzier effect with some real  
15 live numbers without lowering all the other  
16 doses.

17 DR. ANIGSTEIN: And there's  
18 another effect, though and that is we don't  
19 actually have any film data. The film data  
20 does not tell you anything about the dose, the  
21 contact dose to the skin. This is what I was,  
22 you know -- I can't seem to get this to work.

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1 MEMBER BEACH: You turned it off.

2 DR. ANIGSTEIN: Pardon?

3 MEMBER BEACH: It was turned off a  
4 few minutes ago.

5 (Simultaneous speakers.)

6 CHAIRMAN ZIEMER: So in other  
7 words, David, what you're saying is you would  
8 discuss the Puzier effect under Issue 1, in  
9 order to show that your original assumption  
10 readily covered that effect in a general  
11 sense.

12 MR. ALLEN: Yes.

13 CHAIRMAN ZIEMER: Now at a  
14 specific site, you may or may not, or would  
15 you?

16 MR. ALLEN: Well, like John was  
17 pointing out, the assumptions in TBD-6000 were  
18 essentially a model gamma dose and they are  
19 the same dose for each of the jobs and it was  
20 intended to be a conservative model for the  
21 deep dose, and the beta dose is a ten times  
22 factor, which really did -- it's not an

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1 accident that I was trying to account for this  
2 effect, with kind of a 10 to 1 ratio you can  
3 see at another plant, like in Fernald, when  
4 you had this. You don't see that kind of  
5 ratio at, maybe, a chemical plant.

6 So essentially, yes, it was there.

7 I was attempting to account for this in a  
8 conservative manner. I think these numbers  
9 point out that it actually did manage that,  
10 and I don't think you can account for the  
11 worst-case dose and then raise it up more.

12 You're going to have to have a  
13 difference , and in the end you're going to  
14 end up with somebody working at a facility  
15 that did this and some other jobs. You're  
16 going to pick the highest number, and you're  
17 going to end up with the same number by the  
18 time you're done anyway.

19 CHAIRMAN ZIEMER: Okay. Bob has  
20 got some additional information here. What is  
21 --

22 DR. ANIGSTEIN: This is from the

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1 original SC&A review of Appendix BB, and what  
2 we modeled -- what we modeled here --

3 CHAIRMAN ZIEMER: Okay. For  
4 reference, for those on the line, it's Table  
5 14 in the original SC&A review, right?

6 DR. ANIGSTEIN: Yes.

7 CHAIRMAN ZIEMER: Of TBD-6000?

8 DR. ANIGSTEIN: No, Appendix BB.

9 CHAIRMAN ZIEMER: Oh. This is for  
10 Appendix BB specifically.

11 DR. ANIGSTEIN: Yes. But I mean  
12 the reason -- okay. So here, here we modeled  
13 what then we believed was the -- we still  
14 believe is the characteristic shape, which was  
15 an 18-inch cylindrical ingot with a four-inch  
16 thick slice from the middle.

17 So the Puzier effect would only  
18 effect the outer edges, because the cut  
19 surface would not have been exposed at the  
20 time of melting.

21 So if you look at the side, the  
22 contact dose is a 1,348 mrad per hour. Go to

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1       one foot, you're down to 58. So the film  
2 badge is not going to be any closer than one  
3 foot. More likely it will be further. You go  
4 to one meter, down to 8.7.

5               Now this falls off more rapidly  
6 than it would for a large piece of uranium,  
7 because you're looking at only -- what you're  
8 looking at is four inches wide and then 18  
9 inches in height, 18-inch diameter. So the  
10 fall-off is a little faster than it would be.

11               But the fall-off is certainly --  
12 so the film badge, if it's somewhere between  
13 one foot and one meter, I mean I'm holding a  
14 piece of metal and I'm wearing a film badge,  
15 I'm more than 12 inches away, or maybe 18  
16 inches away. So somewhere in between the two.

17               Even if the skin other than the  
18 hands and arms is covered, it's captured by  
19 the film badge non-penetrating radiation  
20 reading, the open-window reading. That still  
21 does not adequately account for the contact  
22 dose, and the assumption that it was 6.5.

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1                   MEMBER POSTON:     Stop, stop.     I  
2     don't understand what you mean when you say it  
3     doesn't count for the contact dose.

4                   DR. ANIGSTEIN:    It doesn't measure  
5     the contact dose, because the film badge is  
6     worn on --

7                   MEMBER POSTON:    But you don't care  
8     about the contact dose; you want to know the  
9     dose of the skin or the whole body.

10                  DR. ANIGSTEIN:    To the skin of the  
11     whole body I agree, but not to the skin of the  
12     person holding his hand and --

13                  MEMBER POSTON:    But you excluded  
14     that.    You said the film badge was measuring  
15     the dose --

16                  DR. ANIGSTEIN:    No, no.     I know.  
17     I know that.     But I'm saying that to  
18     extrapolate from the film badge readings to  
19     the contact dose, I don't think, is done  
20     correctly, because -- yes, the 3.65 simply  
21     doesn't do it.

22                  CHAIRMAN ZIEMER:    You want the

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1 contact dose from the skin of the trunk to the  
2 contact dose of the skin of the hand?

3 DR. ANIGSTEIN: The skin of the  
4 hand. The skin of the hand.

5 DR. NETON: But I thought we had  
6 different model values for hands --

7 DR. ANIGSTEIN: You do, you do,  
8 you do, and the difference is --

9 CHAIRMAN ZIEMER: But you can  
10 scale that from film badge data.

11 DR. ANIGSTEIN: Yes, but it's  
12 being scaled from film badge data, and the  
13 ratio, the median is a factor of about 11,  
14 from 21 to 230 and I would suggest that that's  
15 not enough, that if the film badge were at one  
16 foot, you would have a multiplier of 45 and  
17 not 21. If the film badge was at one meter,  
18 you'd have a multiplier of like 250.

19 MR. ALLEN: Now John just made the  
20 argument that 200 times 200 or what was your -  
21 -

22 DR. MAURO: In other words, yes.

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1 I came at the problem in a much simpler way.

2 DR. ANIGSTEIN: Now at the 95th  
3 percentile, we're okay.

4 DR. MAURO: We're okay, exactly.

5 DR. ANIGSTEIN: But if you don't  
6 use the 95th percentile, that's where we have  
7 the problem.

8 MR. ALLEN: And I'm trying to  
9 recall the median for the skin of the hand and  
10 --

11 DR. MAURO: I've got it right  
12 here.

13 DR. ANIGSTEIN: Two thirty.

14 DR. MAURO: The median is 230.  
15 The median is 230 rem per year to the hands,  
16 out of TBD-6000.

17 DR. ANIGSTEIN: So if you assume -  
18 -

19 MR. ALLEN: But I guess my point  
20 all along has been by the numbers you've got  
21 there, you've got 721 millirems per hour.

22 DR. ANIGSTEIN: No, no, that's --

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1       excuse me.       That's the cut.       That's the  
2       average of the cut slice, where you have one  
3       side that does not have the enhanced Puzier  
4       effect.       But it does have actually the  
5       betatron radiation, the radiation.       So don't  
6       look at the side.       Just look at the front.       I  
7       mean don't look at the front; look at the  
8       side.

9                       MR. ALLEN:       Okay.       The side is  
10       1,350 millirems per year.

11                      DR. ANIGSTEIN:   Per hour.

12                      MR. ALLEN:   Per hour, excuse me.

13                      DR. ANIGSTEIN:   Right.

14                      MR. ALLEN:       The value we're  
15       assigning as a median is 200 rem per year.       I  
16       forgot the number already.

17                      DR. ANIGSTEIN:   230 rem per year,  
18       and with the assumption of 1,000 hours.       So  
19       1,000 hours means you're talking about 230  
20       millirem per year, per hour, as opposed to  
21       what we model as 1,350.

22                      MR. THURBER:   But the 230 millirem

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1 per hour is an experimentally measured value  
2 presumably for uranium with a contamination  
3 distributed uniformly. It's an experimental  
4 measurement, 230.

5 MR. ALLEN: I'm getting my numbers  
6 mixed up. I need to actually look a few  
7 things up here, but --

8 DR. ANIGSTEIN: Yes. But Bill,  
9 that would be -- but that does not account --  
10 that would be old uranium and not new uranium.

11 MR. THURBER: That's what I said.  
12 It's with a contamination uniformly  
13 distributed.

14 DR. ANIGSTEIN: Exactly. If I can  
15 just be --

16 MR. THURBER: It doesn't have the  
17 surface effect contamination in it, is what  
18 I'm trying to say.

19 DR. ANIGSTEIN: If I may be  
20 pedantic, it's not only a contamination; it's  
21 the natural --

22 MR. THURBER: Yes, I understand.

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1                   CHAIRMAN ZIEMER:   Okay.  Let's see  
2                   where we are on this.  The issue boils down to  
3                   whether or not the original model is  
4                   sufficiently conservative to cover a  
5                   reasonable contribution of the Puzier effect  
6                   in these facilities.

7                   That's what it boils down to and  
8                   at some point, I don't know if we need any  
9                   additional information, but the Work Group  
10                  needs to make a recommendation on this  
11                  particular item to the Board.

12                  Mark, do you have any additional  
13                  comments on this one?  You've been kind of  
14                  quiet here.

15                  MEMBER GRIFFON:  No, no.  I think  
16                  I'm sort of digesting it all, Paul.  I mean  
17                  the one thing; I was trying to look for those  
18                  numbers and the difference on the extremity  
19                  doses.  But, no, I think it was a pretty good  
20                  overview.

21                  CHAIRMAN ZIEMER:  Now let me ask  
22                  you a practical question.  In terms of the use

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1 of this, David, you assign everybody the same  
2 dose; is that correct, with the distribution,  
3 but you have to look at their cancer?

4 MR. ALLEN: Yes. The dose that  
5 you're assigned here is essentially as if it  
6 were a film badge dose, and then you take DCF  
7 et cetera into account on a particular organ.

8 So deep doses, skin dose and then a whole  
9 body and then a hands-and-forearms.

10 CHAIRMAN ZIEMER: Right. So if  
11 the cancer's in this part of the body, you  
12 assign that hand dose. If it's skin cancer in  
13 the trunk, you assign the larger value in  
14 full, right?

15 DR. MAURO: And that would be --

16 CHAIRMAN ZIEMER: And the  
17 distribution.

18 DR. MAURO: With the distribution,  
19 and that would be whether the person was just  
20 new, only working. There was no Puzier going  
21 on, or there was Puzier going on. It wouldn't  
22 change it. I guess that's --

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1                   CHAIRMAN ZIEMER: Right now, as I  
2 understand it, they're saying that the uranium  
3 model originally used was so conservative that  
4 it covers that Puzier distribution.

5                   DR. MAURO: And it does, certainly  
6 at the value --

7                   CHAIRMAN ZIEMER: Which is well  
8 beyond the --

9                   DR. MAURO: Well beyond that I  
10 mean I would say -- I would go as far as to  
11 say that assigning the 95th percentile as a  
12 fixed value would be off the charts, okay.  
13 But at the same time I would say it's not  
14 apparent assigning the full distribution is in  
15 fact claimant-favorable.

16                   CHAIRMAN ZIEMER: Or not.

17                   DR. MAURO: Well, yes.

18                   CHAIRMAN ZIEMER: Well, I think as  
19 Jim pointed out, that could go either way,  
20 because the effect is not as if you assigned a  
21 fixed dose at the median. I mean you're still  
22 making the selection and the PoC is still

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1 selected way up at the tail, which is a very  
2 different -- yes, okay. Let me see if any of  
3 the other --

4 MEMBER BEACH: I guess I want to  
5 be clear. On our Issue 1, it said that we  
6 would address the matter, talk about it, and  
7 then we would leave it in abeyance until the  
8 TBD was revised. I just want to be really  
9 clear on it. Is the TBD going to be revised?

10 MR. ALLEN: She asked if the TBD  
11 is going to be revised. That's what I tried  
12 to bring up the last Work Group meeting we  
13 had, was my intent was to revise the language  
14 and point out how it's accounted for. But at  
15 the last Work Group meeting, I clarified  
16 whether we thought that really would have an  
17 effect on the numbers.

18 The answer was yes. Now we're  
19 discussing whether it actually could have an  
20 effect on numbers. The language definitely  
21 needs to be updated. It should be accounted  
22 for the TBD --

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1                   CHAIRMAN ZIEMER:    If you're only  
2                   talking about the change that clarifies the  
3                   discussion, I think you're asking, does the  
4                   applied model change.

5                   MEMBER BEACH:    Right.

6                   MR. ALLEN:           And that was the  
7                   question last time, and right now my opinion  
8                   is no.    I mean it's covered under there.  
9                   That's the discussion we're having now.

10                  CHAIRMAN ZIEMER:   Right.  Well, we  
11                  need to bring this to closure, though.  Are  
12                  you, David, from NIOSH's point of view, are  
13                  there any other issues?  Are you looking at  
14                  something else that would possibly change this  
15                  or --

16                  MR. ALLEN:    I have not.  I thought  
17                  this would be something that would definitely  
18                  do it.  Apparently, it's not.  But then the  
19                  question is what --

20                  CHAIRMAN ZIEMER:   Well, I'm not  
21                  sure that that characterizes it correctly.  I  
22                  think SC&A is suggesting that selection of the

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1 fixed value of the 95th may be more claimant-  
2 favorable than --

3 DR. MAURO: I would say it's --

4 CHAIRMAN ZIEMER: But we don't  
5 know that.

6 DR. MAURO: I know how I look at  
7 it, I look at it. I'm doing --

8 CHAIRMAN ZIEMER: Well wait. Are  
9 you asking whether it's the median and then  
10 the distribution, which I think you're saying  
11 you're using a five or five to five, or  
12 whether it's a mean or what was the other  
13 value that --

14 DR. MAURO: Well, there are a lot  
15 of metrics you could pull on. We know that --

16 CHAIRMAN ZIEMER: I mean, I've got  
17 to do a 95th plus a --

18 DR. MAURO: Right, no. In theory,  
19 the options are leave everything alone,  
20 because the arguments you're making to leave  
21 it geometrically and a very large  
22 distribution, you account for it. Now for all

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1       intents and purposes, that's basically what  
2       you're saying.

3                   Another argument could be made,  
4       no. You know, if you use the 95th percentile  
5       as a fixed value, it's certainly claimant-  
6       favorable under any circumstances to the point  
7       that maybe it's overly favorable, right.

8                   Then there's the arithmetic mean,  
9       which actually falls as a fixed value, which  
10      actually falls someplace between the two,  
11      which turns out to be a number that is a  
12      little bit more, what I would say, claimant-  
13      favorable but not over the top.

14                  Now so I mean, so really what we  
15      have is these alternative strategies, all of  
16      which I would say are not all that  
17      unreasonable. I mean they seem to be ways of  
18      coming after the problem. What I confront  
19      myself with, I say I'm doing a dose  
20      construction, and I've got a guy that worked  
21      that facility.

22                  I know that one of his jobs, and

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1 let's say I'm looking at his job description,  
2 and it turns out he spends a lot of time doing  
3 the reduction work, in other words, in other  
4 words, doing the reduction process where you  
5 make bombs and you drop out the dingot, and  
6 then maybe you go through that cycle many  
7 times. That's his job at this facility.

8 I would imagine there may very  
9 well have been people at Fernald, and maybe  
10 ElectroMet, certainly ElectroMet, where that  
11 was their job. They took the uranium nitrate,  
12 they mixed it up with a bunch of magnesium,  
13 they heated it up and out drops this uranium  
14 ingot and then you do it again. Maybe you do  
15 it again, until you get yourself a really nice  
16 ingot and each time that happens, you're going  
17 to have this Puzier thing going on.

18 Now here we have this guy and that  
19 is his job. Now I would say that we might get  
20 a little sign, and let's say they have a film  
21 badge -- and especially if there's one, you  
22 know, on his chest or a ring badge. Then

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1 we're done.

2 But let's say we don't have that,  
3 and we want to reconstruct this dose. I have  
4 to say right now I'm not too happy with the  
5 geometric mean and the standard deviation as  
6 used in TBD-6000 to apply to that guy. I  
7 guess that's really where it comes down.

8 MR. ALLEN: I guess the question  
9 on my part is why are you not happy with that?

10 DR. MAURO: Because I know that  
11 there's a very real possibility he's going to  
12 spend many, many hours per year in a radiation  
13 field that's 10 to 15 times higher than the  
14 one in --

15 MR. ALLEN: And what you described  
16 is essentially how it would work at Fernald if  
17 the guys were assigned to the bottom remelt,  
18 dropping this mold, you know, moving it around  
19 to the separation booth. That would actually  
20 take the mold --

21 DR. MAURO: Fine. Then you go to  
22 assign the highest value, all right. Let me

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1 ask you this question. Are you going to take  
2 the highest value out of Fernald and assign it  
3 to this guy?

4 MR. ALLEN: Like you said, if you  
5 have film badge data --

6 DR. MAURO: You don't have to.

7 (Simultaneous speakers.)

8 DR. MAURO: The question is what  
9 are you identifying for this guy?

10 MR. ALLEN: If I assigned a high  
11 value from Fernald for all year, then it would  
12 be at 52 rem. As Jim pointed out, I'm not so  
13 sure that's more favorable than --

14 DR. MAURO: Maybe that's for after  
15 the show. In other words, if you can show  
16 them that assigning the highest deterministic  
17 value that comes off Fernald to this guy is  
18 equivalent, maybe even more conservative, than  
19 assigning the geometric mean and standard  
20 deviation out of TBD-6000, then you've made  
21 your case.

22 MR. ALLEN: Is that the marching

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1 orders?

2 CHAIRMAN ZIEMER: I don't know, I  
3 don't know.

4 DR. ANIGSTEIN: Well, actually,  
5 I'm sorry.

6 CHAIRMAN ZIEMER: Well, while  
7 you're doing that, let me ask Dave, if you had  
8 a facility where you could delineate on job  
9 descriptions the folks that handle dingots  
10 versus those that didn't, then what happens,  
11 where you could -- now I'm just talking  
12 theoretically.

13 MR. ALLEN: If we had one where we  
14 knew the guy actually had a particular task  
15 where always, and you know, we could assign  
16 the particular doses from that particular task  
17 out of TBD-6000. I can't think of a specific  
18 example where that's ever -- where we would  
19 actually have that. Or where the facility  
20 only did want that.

21 DR. MAURO: But what if you all  
22 did, ElectroMet is a good example.

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1                   MR. THURBER:     The problem with  
2     ElectroMet is basically a TBD-6001 issue, not  
3     a TBD-6000 issue.

4                   DR. MAURO:       Well this issue  
5     applies to both, I mean whether they're 6000  
6     or 6001. In fact, I think it applies more to  
7     6001 than 6000. It's more likely you're going  
8     to be melting uranium in a TBD-6001 facility  
9     than in a TBD-6000, where most of the time you  
10    are doing a lot of grinding and rolling.

11                  CHAIRMAN ZIEMER:   Okay. Bob, you  
12    have a comment here?

13                  DR. ANIGSTEIN:    Yes. Here's a  
14    report that we put out, I believe it was in  
15    2005, on the effects, that would raise the  
16    issue that Jim Neton raised, about what's the  
17    difference between using the 95th percentile  
18    and the full distribution.

19                  Here, if you have a GSD -- well, I  
20    can just use this.

21                  DR. NETON:       Bob, I don't want to  
22    stop you in your tracks here, but we're not

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1 talking about using the 95th percentile versus  
2 a fixed distribution.

3 DR. ANIGSTEIN: Well, we were  
4 talking about -- you were saying that the  
5 distribution maybe actually more claimant-  
6 favorable.

7 DR. NETON: Than using a 51, which  
8 is only two times the median value. That's  
9 very different --

10 DR. ANIGSTEIN: Oh, okay.

11 (Simultaneous speakers.)

12 DR. MAURO: Let it go, let it go.

13 DR. NETON: Yes. I would agree  
14 with what you're going to present there, but  
15 what we're saying if you've double the median  
16 values, you can assign that.

17 DR. ANIGSTEIN: I got you. Okay.

18 DR. NETON: You're still five  
19 times lower than the 95th percentile.

20 DR. ANIGSTEIN: Basically, the  
21 difference is by a factor of two. If you were  
22 to use the 95th percentile, you would get

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1 about twice the cancer probability.

2 DR. NETON: I completely  
3 understand that, and okay.

4 CHAIRMAN ZIEMER: Okay. Any other  
5 questions on this? Work Group members, I  
6 don't know if you're prepared yet to close  
7 this out. And Mark, you're still pondering  
8 this, I guess.

9 But and I don't know if NIOSH --  
10 you're not necessarily suggesting that you're  
11 going to do any further analysis or that you  
12 believe further analysis, based on our  
13 discussion here. Are you guys satisfied that  
14 this is the way you want to proceed? SC&A has  
15 raised their issues, and there's --

16 MR. ALLEN: I'm not convinced  
17 assigning anything other than that  
18 distribution is -- I'm convinced that  
19 assigning a distribution is okay as it is, and  
20 John is certainly not convinced of that and I  
21 guess my question --

22 CHAIRMAN ZIEMER: Well, you've

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1 questioned it.

2 DR. MAURO: I questioned it.

3 CHAIRMAN ZIEMER: Yes.

4 MR. ALLEN: But you're not even  
5 saying it's wrong; you're not convinced it's  
6 correct.

7 DR. MAURO: Yes. I'm saying the  
8 median, the case has not been made that the  
9 median with this distribution is going to be  
10 appropriately claimant-favorable to a guy  
11 whose job it is to largely work with Puzier  
12 ingots. That's where I come out.

13 MR. ALLEN: But then my question would  
14 be for the Board, you know, is the Board, the  
15 Working Group satisfied and if not --

16 CHAIRMAN ZIEMER: That's what I'm  
17 asking now. Does the Work Group wish any  
18 further analysis be done?

19 MEMBER BEACH: Bob had brought up  
20 earlier about doing some hypothetical dose  
21 reconstructions. Is that something that would  
22 be helpful or --

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1 CHAIRMAN ZIEMER: Well, I ask --

2 MEMBER BEACH: That's what I'm  
3 asking. I'm asking John and Bob if that's  
4 something we need to do.

5 CHAIRMAN ZIEMER: You're talking  
6 about specific cases or hypothetical cases?

7 MEMBER BEACH: Hypothetical.

8 CHAIRMAN ZIEMER: Such as what you  
9 described versus --

10 MEMBER BEACH: Well --

11 DR. NETON: I would suggest that  
12 if we did the analysis and tried the 51 value  
13 versus the whole distribution and it was very  
14 clear, and it was only to be claimant-  
15 favorable to use the distribution, then maybe  
16 this issue goes away.

17 DR. ANIGSTEIN: But what about the  
18 issue -- but still the point I raised, the  
19 fact that the ratio between the dose to the  
20 hands and the general skin dose, I think, is  
21 not consistent with our MCMP analysis.

22 There's a much higher -- in other

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1 words, depending on whether you -- the film  
2 badge is at one foot or at one meter, you have  
3 a multiplier that goes between 43 and 250, as  
4 opposed to only 11.

5 CHAIRMAN ZIEMER: Is that specific  
6 to this TBD, or is that a system-wide question  
7 that's come up in other --

8 DR. ANIGSTEIN: That's just for  
9 dose on this -- it's from the uranium, from  
10 natural uranium, basically.

11 DR. NETON: It would be relevant  
12 to anybody who had skin dose, people with skin  
13 dose --

14 (Simultaneous speakers.)

15 CHAIRMAN ZIEMER: Are you saying  
16 that in all cases, the geometrical factor  
17 NIOSH is using for hands to body is --

18 DR. ANIGSTEIN: Yes.

19 CHAIRMAN ZIEMER: Not just here?

20 DR. ANIGSTEIN: Based on this one  
21 analysis that we did, and we can certainly do  
22 more; we did it for this --

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1                   CHAIRMAN ZIEMER:    Has it shown up  
2    in other cases?

3                   MR. ALLEN:    I don't recall.

4                   DR. NETON:    We did not have this  
5    issue come up.

6                   DR. ANIGSTEIN:   We haven't raised  
7    it before.

8                   CHAIRMAN ZIEMER:   Do you not have  
9    a standard correction factor for the various  
10   organ positions?  I mean if you go from --

11                                       (Simultaneous speakers.)

12                   CHAIRMAN ZIEMER:   -- from a whole  
13   body badge-extrapolated, or if you want a hand  
14   dose, if someone gets a skin cancer in their  
15   hand, and then you have film badge data, do  
16   you have a standard ratio that's used?

17                   MR. ALLEN:    I don't believe we do.  
18    We've got TBD-6000/6001.  Other than that, I  
19    think it's based on data from that facility,  
20    whatever data we would have.  But no, I don't  
21    think we have a standard.

22                   CHAIRMAN ZIEMER:   Well, how would

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1 you -- you're always calculating organ doses  
2 from the film badge?

3 DR. NETON: Well, we're talking  
4 about shallow dose here primarily, and then  
5 there's no organ doses other than the skin.  
6 Or for beta activity really.

7 CHAIRMAN ZIEMER: Now maybe we  
8 don't get that many skin doses.

9 DR. NETON: We don't get a lot of  
10 hand cancers.

11 MR. ALLEN: But I did want to  
12 plant that 11, the factor of 11 that's been  
13 mentioned is from skin of the whole body to  
14 skin of the hands. The factor from deep dose  
15 through skin of the hands is ten times that.  
16 It's 110, which is consistent with the two  
17 millirem photon on the surface versus, you  
18 know.

19 DR. ANIGSTEIN: Yes. But I was  
20 specifically talking about the beta dose to  
21 the film badge and the beta dose to the -- and  
22 the surface contact beta dose. That was the

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1       only point I was raising.

2                   MR. ALLEN:       Yes.       I'm    just  
3       pointing out that the measurements essentially  
4       on a side of uranium, the ratio seems to be  
5       reasonably consistent, about 110 to 1, when  
6       you're talking about two.    So you're talking  
7       about two millirems on the surface.

8                   DR. ANIGSTEIN:     But now we're  
9       talking about --

10                   (Simultaneous speakers.)

11                   DR. ANIGSTEIN:     Well, I'm only  
12       comparing it to the deep.    You're comparing it  
13       to the skin.

14                   MR. ALLEN:     But that would imply,  
15       if it is consistent as far as deep to surface  
16       beta gamma dose ratio, and you're saying that  
17       the ratio of whole body scan to hands, skin  
18       dose is not appropriate or too low, it implies  
19       that the skin of the whole body, again, is too  
20       high.    There's a measurement that basically  
21       says two and 200, that's a 101 ratio.

22                   DR. MAURO:       Sure.       The non-

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1 penetrating at one foot is two; the  
2 penetrating, the total at contact.

3 MR. ALLEN: At contact, not one  
4 part.

5 DR. MAURO: So yes. That's  
6 physics. That's not measurements. That's  
7 physics.

8 MR. ALLEN: And that's essentially  
9 what the ratio is in TBD-6000. It's actually  
10 a ratio of 110 to 1.

11 DR. ANIGSTEIN: But you're  
12 justifying it on the basis of the film badge  
13 reading of non-penetrating radiation, and I'm  
14 simply saying that the film badge data on non-  
15 penetrating radiation is not being correctly  
16 extrapolated to the contact dose to the hands  
17 in contact with the metal.

18 MR. THURBER: Bob? This is Bill  
19 Thurber. The dose to the hands is based  
20 directly on the experimental measurement of  
21 230 millirad per hour or whatever. But the  
22 dose to the skin other than the hands and arms

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1 that uses this tenfold factor of the photon  
2 dose at one foot to the dose to the skin on  
3 the neck or wherever.

4 DR. ANIGSTEIN: Fine. But the 230  
5 does not account for it. It does not take  
6 into account the Puzier effect.

7 MR. THURBER: Granted that, no.  
8 But I'm just saying that the hands-and-arms  
9 doses is -- in TBD-6000, the hands-and-arms  
10 dose is derived differently from the rest of  
11 the skin.

12 In one case for the hands and arms  
13 that uses experimental measurements of contact  
14 dose, if you will, and in the other case, it  
15 uses an empirical factor which says that the  
16 ratio of the photon dose to the other skin  
17 dose is tenfold, then I would note if anybody  
18 is ever going to revise TBD-6000, the source  
19 of that information is incorrectly referenced  
20 and untraceable.

21 CHAIRMAN ZIEMER: Bill, we're  
22 going to take -- the Chair wants a comfort

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1 break, so we're going to take a break for ten  
2 minutes right now. Thanks.

3 MR. KATZ: We'll start back up  
4 around quarter after. It's about five after  
5 right now

6 (Whereupon, the above-entitled  
7 matter went off the record at 11:03 a.m. and  
8 resumed at 11:16 a.m.)

9 MR. KATZ: Okay. We are  
10 reconvening after a short break. This is the  
11 TBD-6000 Work Group. Dr. Ziemer.

12 CHAIRMAN ZIEMER: Okay. Let me  
13 ask the Work Group members, do you need any  
14 further information on this issue? Are we  
15 ready to close it, or do you want to carry it  
16 over until the next meeting?

17 MEMBER GRIFFON: Paul, this is  
18 Mark.

19 CHAIRMAN ZIEMER: Go ahead, Mark.

20 MEMBER GRIFFON: You know, I think  
21 it may be -- I think we're very close to  
22 closing this, but I think it might be

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1 worthwhile to see that comparison that John  
2 was mentioning, the static 95th versus the  
3 full distribution and to see what effect that  
4 has on various organ and PoC calculations.

5 DR. NETON: Mark, this is Jim. It  
6 wasn't -- I don't think he's proposing the  
7 static 95th. I think he was talking about  
8 using the highest value that they found. I  
9 think it was at Fernald, and use that as a  
10 constant versus the full distribution.

11 In other words, they thought 51, I  
12 think 50-something rem, of the highs of a  
13 125,000 or whatever measurements he reviewed.

14 DR. MAURO: You know what might be  
15 worthwhile --

16 MEMBER GRIFFON: One question I  
17 had on that topic is going after the extremity  
18 question. I don't think the Fernald  
19 information is whole body values, I am  
20 assuming. So there's no extremity  
21 information. I'm not sure in TBD-6000 how the  
22 full-on hand doses were estimated. Was that

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1 data from extremity data or --

2 CHAIRMAN ZIEMER: Dave, could you  
3 clarify that for Mark?

4 MR. ALLEN: He just pointed out  
5 that --

6 MEMBER GRIFFON: The TBD-6000  
7 Table 6.4.

8 CHAIRMAN ZIEMER: The extremity  
9 dose. He's asking how they were --

10 MR. ALLEN: How they were  
11 calculated?

12 MEMBER GRIFFON: The basis.

13 MR. ALLEN: I'd have to look at --  
14 there was a model thing, I think John alluded  
15 to earlier, for all of them. The deep, the  
16 skin, the whole body and the extremity were a  
17 model dose, and I don't remember the exact  
18 assumptions in that one.

19 But to answer something you  
20 mentioned earlier, yes, the bulk of the data  
21 at Fernald is whole body film badge data.  
22 There is some ring and wrist data, but it's

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1 very limited and I don't have who it was on  
2 or, you know, where they were. So I didn't  
3 use any of that.

4 DR. MAURO: Bill Thurber, are you  
5 on the line?

6 MR. THURBER: Yes, I am.

7 DR. MAURO: Bill, I think they're  
8 talking about the 3.65 multiplier, on how they  
9 went from the annual dose external, annual  
10 dose to skin, not including the hands and  
11 arms, which were reported for Fernald, and  
12 then from there, which was -- you know, I've  
13 got a number here of 52 rem per year. Then  
14 they multiply that by 3.65 in order to get --

15 MR. THURBER: No, no, no.

16 DR. MAURO: Okay, good. Well,  
17 you're closer to this.

18 MR. THURBER: Okay. First of all,  
19 what was done in TBD-6000 for the dose to the  
20 skin, other than the hands and arms. They  
21 took this value of two millirem per hour that  
22 we've been talking about, and they said we

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1 have empirical data that says the dose to the  
2 skin, other than the hands and arms, is ten  
3 times the photon dose at one foot.

4 So that's how they got, and they  
5 assume that to then be the geometric mean.  
6 That's how they got the dose to other than  
7 hands and arms in Table 6.4 of TBD-6000.

8 MEMBER GRIFFON: Excuse me, Bill.

9 This is Mark Griffon. When you say "they" --

10 MR. THURBER: NIOSH.

11 MEMBER GRIFFON: NIOSH says they  
12 have empirical data, and most of that  
13 empirical data is from the Adley report, isn't  
14 it?

15 MR. THURBER: No, no. This is  
16 what I mentioned earlier that was confusing,  
17 and we just haven't had a chance to dig it  
18 out, because we've only been looking at this  
19 for a day or so. But in TBD-6000, they say  
20 this tenfold factor for the photon dose to the  
21 skin other than the hands and arms, came from  
22 ORAUT 2005.

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1                   Well unfortunately, there are five  
2           ORAUT 2005 references in TBD-6000. So that's  
3           what I meant. We hadn't been able to trace  
4           that number back the next step, because we  
5           don't know which reference is the correct one.  
6           Maybe somebody in the meeting does.

7                   CHAIRMAN ZIEMER: Well, apparently  
8           not off the top of our heads here.

9                   MR. THURBER: I would think not,  
10          but I'd just point out that our analysis has  
11          stopped at that point, because we didn't have  
12          time to go look at all those documents and see  
13          if we could find where this tenfold factor  
14          came from.

15                  DR. MAURO: But Bill, I was asking  
16          more how did they get to the skin direct  
17          contact handle dose, non-penetrating?

18                  MR. THURBER: The skin dose was  
19          measured. There was experimental work done,  
20          and they cite a reference, NIOSH cites a  
21          reference, and says that it's 230 rem per hour  
22          at contact.

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1 DR. MAURO: Okay. I see a  
2 footnote.

3 MR. THURBER: No, no. But that  
4 3.65, John --

5 DR. MAURO: Yes, that's my  
6 question.

7 MR. THURBER: No. That's  
8 something I invented. That's nothing to do  
9 with anything else. The 3.65 was -- I'm  
10 sorry. The NIOSH analysis that David Allen  
11 presented, as I mentioned at the beginning,  
12 related to the skin dose other than the hands  
13 and arms.

14 I tried to take it one more step  
15 and compare it to the hands and arms dose in  
16 Table 6.4 of TBD-6000, by making the  
17 assumption that the dose to the hands was  
18 3.65 times what a film badge reading was.

19 That 3.65 factor came from OCAS  
20 TIB-0013, where they had a body model and  
21 determined that the hands have got 3.65 times  
22 what was the film badge dose. So that's where

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1 that came from. That was my way to take the  
2 Fernald measurement, if you will, and make it  
3 kind of look like the hands and arms.

4 MEMBER GRIFFON: Can I back up,  
5 just to follow up on what you just said. You  
6 had the 230, and I believe you meant millirad  
7 per hour at contact.

8 MR. THURBER: 230 is the dose from  
9 the hands, the annual dose in rem. Now I'm  
10 sorry. What's confusing here is that the dose  
11 to the hands in millirem per hour works out to  
12 be the dose to the hands in rem per year,  
13 because there's 2,000 hours in a year and they  
14 assume the contact is 50 percent of the time.

15 So there's confusion, optical confusion here.

16 But 230 rem per year is the median  
17 dose to the hands and arms in TBD-6000, and  
18 it's based on 230 millirem per hour measured  
19 dose at contact.

20 DR. MAURO: For 1,000 hours.

21 MEMBER GRIFFON: For 1,000 hours a  
22 year.

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1                   MR. THURBER:       For a thousand  
2 hours, yes sir.

3                   MEMBER GRIFFON:   Now but I don't  
4 understand how in the first, looking at Table  
5 6.4, the operator hands and forearm, non-  
6 penetrating doses are about 750.   You're  
7 talking non-penetrating here, right?

8                   MR. THURBER:       Right.       We're  
9 talking non-penetrating.   Those doses are per  
10 calendar day.

11                   MEMBER GRIFFON:   Right.

12                   MR. THURBER:   And you need to look  
13 at the after 1956 or whatever number, because  
14 again, one of the secrets underlying Table 6.4  
15 is that there are three sets of numbers for  
16 each operator and each category, and the first  
17 set is really based on a 48 hour work week,  
18 the second on a 44 hour work week, and the  
19 third on a 40 hour work week, as David Allen  
20 kindly explained to me one time.

21                   MEMBER GRIFFON:   Right.

22                   DR. MAURO:       One of the

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1 frustrations is we're speaking right now, SC&A  
2 is speaking from a draft document that Bill  
3 Thurber prepared yesterday, which tries to  
4 sort out all these numbers, make all these  
5 comparisons and the numbers are all jumbled  
6 around now.

7           Why don't we deliver a White Paper  
8 in response to your paper, so everyone could  
9 look at it, the best we can, so everyone will  
10 have the same information in front of them?  
11 Maybe at that point, you know, NIOSH could say  
12 okay, we see SC&A's position as written, and  
13 then decide whether it has any virtue.

14           Because really right now, what  
15 we're really discussing is well, we're a  
16 little -- all we're really saying is, using  
17 the full distribution, based on the work we've  
18 done, which you haven't seen, using the full  
19 distribution of TBD-6000 seems to be a little,  
20 somewhat non-claimant-favorable when, in fact,  
21 the claimant is a person that had a job up  
22 close and personal to an ingot. That's it. I

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1 mean that's all we're really saying.

2 CHAIRMAN ZIEMER: Well, John, yes.

3 You have a document you're working from that  
4 we haven't seen, and that would be helpful. I  
5 think Mark was suggesting we not close this  
6 today, so that will give you a chance to  
7 provide that.

8 (Simultaneous speakers.)

9 MEMBER GRIFFON: I have one --  
10 that you should point out to me for my  
11 understanding. If I take 230, I understand  
12 the 40, 44 and 48 hour rates, and I see the  
13 operator post '56, it says 630 millirem. I'm  
14 just trying to make the numbers work, very  
15 simplistic thing for me here.

16 CHAIRMAN ZIEMER: Yes.

17 MEMBER GRIFFON: 630 millirem per  
18 day, per calendar day. You just said 230. If  
19 I assume half time exposure, I still get 920,  
20 not 630. Am I doing something wrong here?  
21 230 times four. Shouldn't that equal the  
22 number in this table?

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1                   MR. THURBER:    The 630 millirem per  
2   calendar day comes from the 230 millirem per  
3   hour experimental data, times an eight hour  
4   day, times 250 over 365 to convert the  
5   calendar days, times .5 to account for the  
6   fact that the contact is half the time. That  
7   should give you 630.

8                   MEMBER GRIFFON:   Per calendar day.  
9   So you're dividing this over a --

10                  MR.    THURBER:            Millirem    per  
11   calendar day, yes.

12                  MEMBER GRIFFON:   Okay.  That might  
13   be the difference.  Thank you.

14                  CHAIRMAN ZIEMER:        So we'll ask  
15   SC&A to put that paper in final form and  
16   provide it to us.  Also, I don't know if this  
17   is something SC&A could add readily, or if  
18   NIOSH would be the one to do this, but would  
19   be it be of help to have a couple of sample  
20   cases, recognizing that that's not the real  
21   answer, because every case is different.  But  
22   just to sort of demonstrate the impact of

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1 using the distribution, as Dave has described  
2 it, versus using the value. Could you add  
3 that readily to your paper --

4 MR. THURBER: Sure.

5 CHAIRMAN ZIEMER: Again, I think  
6 these are cases where you'd have to be very  
7 careful in selecting the parameters, because  
8 as Jim has suggested, you know, it may depend  
9 on the work. Some other issues may impact  
10 that.

11 DR. MAURO: But you're talking a  
12 hypothetical case.

13 CHAIRMAN ZIEMER: Yes, but use  
14 hypothetical cases.

15 DR. MAURO: Yes, because I don't  
16 know how many real cases we have on skin  
17 cancer of the hand.

18 CHAIRMAN ZIEMER: Probably very  
19 few.

20 MS. WOJCIK: Probably not many.

21 MEMBER BEACH: Then Paul, will the  
22 other issue that Bob brought up, the film

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1 badge data at the source versus the one foot,  
2 is that going to be covered in some way? I  
3 didn't really hear any closure on that.

4 CHAIRMAN ZIEMER: Well, I think  
5 what they're saying is that the distribution  
6 should more than cover anything that they've  
7 ever seen in the film badges. If I were using  
8 the worse Fernald case, you're sort of --  
9 you're pointing out the worse Fernald case is  
10 higher than the median.

11 DR. MAURO: Oh yes. Probably the  
12 worse Fernald case is lower than the 95th  
13 percentile.

14 MR. THURBER: Oh yes, right.

15 DR. MAURO: And that's very  
16 compelling.

17 CHAIRMAN ZIEMER: Right, right.  
18 Okay.

19 MEMBER BEACH: So we won't lose  
20 that.

21 DR. MAURO: Oh no.

22 CHAIRMAN ZIEMER: No. Mark, is

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1 that agreeable with you?

2 MEMBER GRIFFON: Yes, that's fine  
3 Paul. Thank you.

4 CHAIRMAN ZIEMER: Okay. So that's  
5 where we'll go on this one. So --

6 DR. ANIGSTEIN: If I can clarify  
7 on Josie's question. My point was simply that  
8 to use film badge data at confirmation of the  
9 exposure to the hands handling the metal, you  
10 have to use a different multiplier than was  
11 used.

12 MEMBER BEACH: I understand.

13 DR. ANIGSTEIN: That's my only  
14 point.

15 MEMBER BEACH: Right.

16 MEMBER BEACH: They weren't using  
17 -- they're not proposing to use film badge  
18 data to actually calculate those to an  
19 individual during dose reconstruction.

20 MEMBER BEACH: Okay, thank you.

21 CHAIRMAN ZIEMER: Okay. Now let's  
22 move on to -- we had one, Issue 5. We were

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1 talking about closing that, but Mark wanted to  
2 --

3 MR. ALLEN: Doctor, could I --

4 CHAIRMAN ZIEMER: Oh yes, I'm  
5 sorry. David?

6 MR. ALLEN: One point of  
7 clarification. You said something about some  
8 sample cases on that last one?

9 CHAIRMAN ZIEMER: They will show  
10 us a couple, to try to make their point, I  
11 think is what they're saying.

12 DR. MAURO: Okay. The ball's in  
13 our court right now.

14 MR. ALLEN: That was the part I  
15 wasn't clear on.

16 CHAIRMAN ZIEMER: Yes. We have  
17 the Adley report, a White Paper from NIOSH on  
18 the use of the Adley report. Mark hadn't had  
19 a chance to see that prior to our October  
20 meeting, and asked that we not close that  
21 issue until he had a chance to look at that.

22 Mark, I don't know where you are

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1 on that issue. That was Issue 5 of the TBD-  
2 6000 matrix.

3 MEMBER GRIFFON: I mean I did look  
4 it over. I guess the biggest question I would  
5 have is the representativeness of this. If  
6 most people are comfortable with the  
7 representativeness of this data from -- I  
8 mean, this experiment was apparently carried  
9 out at the Hanford facility; correct?

10 DR. MAURO: Yes.

11 MEMBER GRIFFON: And if we believe  
12 that that, those conditions. I mean I'm not -  
13 - I didn't dig down far enough to, you know,  
14 sort of look into whether I felt that that was  
15 representative of the smaller AAC facilities.

16 But I guess that would be the  
17 question. It seems like it's in the same time  
18 frame. The data was done in the early 50's at  
19 Hanford.

20 DR. MAURO: Yes. The Hanford, the  
21 Adley report was early 50's.

22 MEMBER GRIFFON: Yes. So I mean,

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1 I guess -- I think my questions are addressed  
2 in that regard, you know, that it seems like  
3 it was from the right time period and you  
4 know, I guess the assumption would be is the  
5 practices were very similar. In other words,  
6 it wasn't --

7 I guess the environmental  
8 conditions, etcetera, could be assumed to be  
9 fairly similar. That would make, that would  
10 -- then the NIOSH response addresses my  
11 concerns.

12 CHAIRMAN ZIEMER: Okay. Were  
13 there -- SC&A, did you have any other issues  
14 on that?

15 DR. MAURO: No. In fact, this was  
16 an important discussion we had the last time.

17 CHAIRMAN ZIEMER: That was a large  
18 discussion last time.

19 DR. MAURO: We were --

20 CHAIRMAN ZIEMER: I thought we  
21 were in agreement that --

22 DR. MAURO: We were, yes, yes. In

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1 a nutshell, this deposition coming out of the  
2 air, the particles. For the longest time, we  
3 were concerned that that way of predicting  
4 what might be on surfaces, mainly assuming  
5 that whatever the dust loading is, it's  
6 falling at a rate of .0075 meters per second.

7 That's how you're going to predict what's on  
8 surfaces.

9 And I from the very beginning had  
10 a problem with that, because I had -- I said,  
11 but that's not how the uranium at these  
12 facilities gets on surfaces. It gets there  
13 because of a lot of other things going on. Lo  
14 and behold, we looked at the incredible piece  
15 of work called the Adley report, and son of a  
16 gun -- That model works.

17 So we made a reversal. We made a  
18 complete reversal. We're saying you know, and  
19 we have comments on that on 50 separate dose  
20 reconstruction audit reports. They're all  
21 going to go away and that's good news, because  
22 every time we saw that, we said we don't like

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1 that model.

2 Right now, SC&A's position is, no,  
3 that model in our mind has been vindicated,  
4 based on the Adley data, and I think Mark, you  
5 just wanted to make sure you took a look at  
6 that Adley data, to feel if in fact that, you  
7 know, it was powerful enough to sort of end  
8 this issue.

9 MEMBER GRIFFON: That's right,  
10 yes.

11 CHAIRMAN ZIEMER: Okay. So if  
12 there's no further concern on that particular  
13 one, then I would ask the other Work Group  
14 members are we prepared to recommend that this  
15 issue be closed.

16 MEMBER POSTON: Yes.

17 MEMBER BEACH: Yes.

18 CHAIRMAN ZIEMER: I see agreement  
19 in there, with the Work Group members here --

20 MEMBER GRIFFON: Yes.

21 CHAIRMAN ZIEMER: And Mark, okay.

22 So we agree to close that issue. Next we

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1 have the status of Issue 6, and this is just a  
2 report from me. Issue 6 was the one where  
3 NIOSH used a -- well, it has to do with the  
4 resuspension factors and the discussion  
5 between NIOSH and SC&A. NIOSH had  
6 recommended, I think, a 10 to the minus 6 and  
7 SC&A recommended 10 to the minus 5 on those  
8 things.

9 It turns out that this issue on  
10 resuspension comes up not only here but in a  
11 lot of different cases. So the agreement last  
12 time was to transfer this issue to the  
13 Procedures Work Group. So it goes off of our  
14 plate. I just wanted to report that I have  
15 formally sent Wanda that item.

16 So the Procedures Work Group now  
17 will be addressing this. Now realize that  
18 this issue remains, I think, in our  
19 terminology in abeyance for us. We do not  
20 close it. So it would get closed eventually  
21 by the Procedures Work Group. They would  
22 report back.

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1                   Now depending on the outcome of  
2                   that, if there were a change, it would affect  
3                   not only this but many other things, and that  
4                   might impact on what was done on previous dose  
5                   reconstructions. But that's something that  
6                   would go back, and in fact this does not  
7                   affect, generally doesn't affect SEC  
8                   petitions, because it's not an issue of  
9                   whether you can reconstruct dose in that case,  
10                  but it's how you reconstruct dose.

11                  So I don't think it will impact  
12                  specifically on the answer to the SEC  
13                  petition. But just realize that, in a sense,  
14                  this remains unclosed, but it's off of our  
15                  plate right now. Okay. Any questions on that  
16                  one?

17                  MEMBER MUNN: It will be addressed  
18                  on the agenda for the January meeting.

19                  CHAIRMAN ZIEMER: Of the  
20                  Procedures Work Group.

21                  MEMBER MUNN: Work Group.

22                  CHAIRMAN ZIEMER: Thank you. Now

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1 let's move on to the Appendix BB, which is the  
2 General Steel Industries Issue Matrix, and  
3 there are a number of issues there, but in  
4 these issues, 3 to 11 all are sort of lumped  
5 together.

6 But let's look at Issue 1, where  
7 and as I indicated, "Clarify the outcome of  
8 the NIOSH comparison of film badge results  
9 with models." We had a very lengthy  
10 discussion on this last time, but I note that  
11 there may be additional film badge results,  
12 and there's two things here to call attention  
13 to.

14 One is, and we had indicated last  
15 time that there's an indication that there may  
16 be Picker Film Badge Company data present in  
17 the Landauer files. My understanding is that  
18 NIOSH has actually given Landauer a contract  
19 to search and examine those files.

20 I wonder, either Dave or Jim, can  
21 you give us a status report on where we are on  
22 the Picker information?

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1                   MR. ALLEN:    Not much, but I can  
2    tell you what I know.    We did give them a  
3    contract, and the first step was for them to  
4    itemize everything.    It's not just for GSI but  
5    everything in those files.

6                   CHAIRMAN ZIEMER:    Everything in  
7    the files, all the Picker files.

8                   MR. ALLEN:    And we have not  
9    received it yet after several phone calls.  
10   But they're still working on it, but we have  
11   not received it.

12                  CHAIRMAN ZIEMER:    So no outcome  
13   yet from that.

14                  MR. ALLEN:    Yes, yes.

15                  CHAIRMAN ZIEMER:    Okay.    Now,  
16   also, we received information very recently  
17   within the last week from the petitioner, that  
18   there may be some additional film badge  
19   information available, and I think you all got  
20   a copy.    It was a copy of Dr. McKeel's  
21   summary.

22                  We do not have the actual

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1 information, but there was another company  
2 identified in that, and I don't believe  
3 anybody has that information. But, and Dr.  
4 McKeel, maybe you can confirm to us. You only  
5 have the name of the company, as I understand  
6 it, that may have supplied additional  
7 dosimetry; is that correct?

8 DR. McKEEL: Dr. Ziemer, this is  
9 Dan McKeel. Yes, you're correct. I obtained  
10 1,016 pages of FOIA information from the  
11 Nuclear Regulatory Commission, dealing with  
12 byproduct material, seal source licenses at  
13 GSI from 1962 to '74.

14 In those license applications, it  
15 was clearly documented that the Nuclear  
16 Consultants Corporation -- Nuclear Consultants  
17 Corporation, which had offices in St. Louis,  
18 Ohio, California, did administer an active  
19 film badge program. It was at least in the  
20 1962-63 time frame.

21 That company, NCC let's call it,  
22 was later acquired and became a division of

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1 the Mallinckrodt Chemical Works in 1966. So  
2 that information confirmed what I told the  
3 Work Group last October -- not October 2009  
4 but before the -- I'm sorry, before the  
5 November 14th Work Group, the November 10th  
6 Work Group meeting in 2008.

7 At that time, I sent Dr. Anigstein  
8 in SC&A and he shared it with the Work Group  
9 and NIOSH, some reports from one isotope  
10 worker at GSI that was headed -- and this was  
11 four quarters of film badge data in 1963, and  
12 there was one report also from '62 -- those  
13 reports were headed "AEC," and at the bottom  
14 was this Nuclear Consultants Corporation.

15 I mentioned at the time of the  
16 November the 10th '08 Work Group meeting that  
17 Nuclear Consultants Corporation should be  
18 looked for as a source of these -- a second  
19 source of film badges at GSI.

20 So it's very clear from the FOIA  
21 material that that film badge program did in  
22 fact operate, and you know, I have no idea --

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1 NCC, I presume, went out of business when it  
2 was acquired by Mallinckrodt, but it  
3 definitely continued as a named division  
4 called Nuclear Consultants Corporation  
5 Division of Mallinckrodt Chemical Works.

6 So presumably, many of its records  
7 could still be at Mallinckrodt. One  
8 suggestion that flows from that is that that  
9 data should be aggressively sought.

10 That's, you know, so we have that  
11 information, and that should be plenty to  
12 follow up with Mallinckrodt and see what they  
13 can tell us about where those badge data and  
14 everything went.

15 It's in the license applications.

16 NCC plays a very important part, because it  
17 calibrated the survey instruments for GSI; it  
18 designed and administered their radiation  
19 safety program. It conducted a film badge  
20 program; it did a radiologic survey in 1962 of  
21 the Building 6 cobalt-60 radiography facility.

22 So you know, it played a huge

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1 part, and there is ample documentation in  
2 those licenses, documents that they listed  
3 seven types of data that GSI kept, and most of  
4 this data, at least in the early '62 to '67 or  
5 '68 time frame sounds like it was collected by  
6 and overseen and supervised by this NCC  
7 company.

8 Later on, some of those functions  
9 were taken over by St. Louis Testing. But for  
10 instance, it lists in the license that they  
11 kept radiation survey instrument calibration  
12 records, leak test certificates, quarterly  
13 inventory records, utilization logs, film  
14 badge reports in particular, which was an AEC  
15 requirement under the U.S. Code Section  
16 31.203.

17 There were pocket dosimetry  
18 reports and radiation survey records. So I  
19 think those records should be aggressively  
20 sought.

21 CHAIRMAN ZIEMER: Thank you for  
22 that additional information. One of the

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1 questions on the issues matrix was -- also had  
2 to do with the source terms, and of course,  
3 we're well aware of the two large betatrons.

4 We've talked a lot about the 80  
5 millicurie cobalt source and the smaller  
6 iridium source. It appears that there may  
7 have been some other sources also now, based  
8 on the latest information that Dr. McKeel  
9 provided.

10 But let me ask the NIOSH folks.  
11 In terms of the source terms and the modeling  
12 of doses, can you give us a general feel for  
13 the impact that additional source terms would  
14 have on the way the doses are modeled?

15 For example, and there's some  
16 indication perhaps of the source sizes in the  
17 information we have, although I don't think we  
18 have that really confirmed at this point.

19 But based on the preliminary  
20 information we have, can you describe, Dave,  
21 how that would -- if it would at all impact on  
22 the way doses are reconstructed?

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1                   MR. ALLEN:     Well, I think the  
2     information -- I mean, I guess you need to  
3     start from scratch.  When we put together the  
4     Appendix, we had some information and  
5     considerable additional information to come  
6     out since then.

7                   CHAIRMAN ZIEMER:  Right.

8                   MR. ALLEN:     We've had discussions  
9     in here that they had, I think, quarter curie  
10    cobalt sources in the 6 Building that they  
11    were using.  There's been workers who told us.

12     I think what Dr. McKeel sent us the other day  
13    was saying .28 instead of .25.  Or it seemed  
14    to be fairly consistent.

15                   The radium source, as he mentioned  
16    in his email, were not something that I had  
17    heard before from any of the workers or  
18    anything like that.  We had heard of other  
19    sources and it was limited as to the size of  
20    the sources or how much information we had.

21                   In general, I think we generally  
22    were going to have to do some more robust

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1 analysis of radiography in the 6 Building with  
2 the smaller cobalt sources.

3 If this information had some  
4 source sizes or other sources that could be  
5 included in that analysis, my general thinking  
6 right now is that if you're going to do  
7 radiography and get a clear picture, you can't  
8 have too many sources in the vicinity, exposed  
9 sources.

10 CHAIRMAN ZIEMER: All at the same  
11 time.

12 MR. ALLEN: At the same time.

13 CHAIRMAN ZIEMER: Well, one of the  
14 things I was sort of getting at was, for  
15 example, how much difference would it make in  
16 the dose reconstruction if you had one source  
17 of a certain size versus two or four or ten,  
18 because they're not all going to be used at  
19 the same time.

20 MR. ALLEN: That's exactly what I  
21 was getting ready to say. You can't use them  
22 and expose them at the same time in the same

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1 vicinity, or you're defeating the purpose of  
2 them.

3 So I'm thinking we can try to take  
4 an inventory of what we have, develop the  
5 exposure scenario, you know, what a person  
6 could receive from those X-ray shots, and  
7 essentially pick the highest, is what it would  
8 amount to.

9 Because like I said, it's very  
10 counterproductive to -- it's not even  
11 counterproductive. It would be stupid to  
12 expose more than one source in the same area  
13 and expect to get a clear picture.

14 CHAIRMAN ZIEMER: Right, right.  
15 But is it your -- is it NIOSH's intent now to  
16 update this Appendix BB with this new  
17 information, and do you expect there to be  
18 some difference in the dose reconstruction  
19 approach? Or maybe not the approach, but the  
20 outcome.

21 MR. ALLEN: There's been an  
22 attempt to -- there's been a -- I believe that

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1 we're going to be revising that ever since  
2 essentially found the film badge data became  
3 available.

4 I think now with some additional  
5 storage from workers, as far as what was  
6 really occurring various areas, additional  
7 source information and the film badge data, I  
8 think it can all be put together to get a much  
9 clearer picture.

10 I'm not sure the doses are going  
11 to increase with that.

12 CHAIRMAN ZIEMER: Right, but we  
13 don't know for sure that they won't. So it  
14 appears that it will be important as a minimum  
15 to pull all this new information together and  
16 make a determination as to whether it impacts  
17 on how doses are reconstructed and any of the  
18 assumptions made.

19 Now I think we recognize that  
20 NIOSH does not yet have all of this  
21 information, and of course the Work Group does  
22 not either. But the first step would be for

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1 NIOSH to get the information and analyze it,  
2 and then we can evaluate it. We may need SC&A  
3 to take an additional look at things.

4 And we need to find a way, and I  
5 know NIOSH is looking into this, a way to  
6 obtain this information that's useful both to  
7 NIOSH, and which is also we can utilize what  
8 the petitioner has seen, that's fair to the  
9 petitioner in terms of perhaps personal  
10 expenses.

11 But it would also seem to me that  
12 it might be important procedurally for NIOSH  
13 to independently get that information. I'm  
14 not sure how appropriate it is to simply have  
15 a petitioner feed information to NIOSH, just  
16 in general terms, although those are -- the  
17 intention is good, but NIOSH has a certain  
18 responsibility here to having uncovered,  
19 through the petitioner, the source of this  
20 information.

21 NIOSH should obtain that  
22 information, however you do it. But I assume

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1 that can --

2 DR. McKEEL: Dr. Ziemer, this is  
3 Dan McKeel. May I add just one thing to that?

4 One of the other very important bits of  
5 information that was contained in these  
6 licenses was that all during this time, from  
7 1962 to '64, there was a named liaison person  
8 at GSI named [identifying information  
9 redacted], and it was his job to maintain  
10 constant contact with the Illinois State Board  
11 of Health and the Illinois Department of  
12 Public --

13 CHAIRMAN ZIEMER: Of Nuclear  
14 Safety.

15 DR. McKEEL: Well, no. It said  
16 the Illinois Department of Public Health, and  
17 --

18 CHAIRMAN ZIEMER: Oh right. I  
19 think you're exactly right. It later became  
20 the Illinois Department of Nuclear Safety.

21 DR. McKEEL: Right. But the  
22 Illinois Department, IEMA now, the Illinois

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1       Emergency Management and its Nuclear Safety  
2       Division, they have been queried by NIOSH and  
3       by Congressman Shimkus and actually Senator  
4       Obama when he was still a senator, and IEMA  
5       says they have none of those really early  
6       records like that.

7                       But it's quite clear from these  
8       documents that both of those state agencies  
9       came to GSI, participated in joint AEC  
10      inspections, including the Building 6  
11      Radiology facility, and also there's a  
12      reference in those documents to their own  
13      requirements.

14                      So it seems like there were other  
15      things that the state agencies administered,  
16      and again, I think it's extremely important  
17      for NIOSH to pull out all the stops, to get  
18      those early tracing records. I mentioned to  
19      John Ramspott that we supplied the Board with  
20      the fact that there is an Illinois Radiation  
21      Devices Registration Act that was enacted in  
22      1957.

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1           So you know, whether those records  
2           are still at the state health agencies, I'm  
3           not sure. But they clearly were the people  
4           who would have them, and they should be sought  
5           right now.

6           I just want to add for the record  
7           that this time, NIOSH tried to get the  
8           licenses information that I got. SC&A tried  
9           to get the licenses that I got. Department of  
10          Energy was encouraged to try to get them and  
11          didn't get them.

12          So this time, I think there have  
13          got to be written requests and really an  
14          intensive effort, and I would urge that the  
15          appropriate thing to do would be to send a  
16          data capture team to both state agencies, and  
17          to go through their records and see if we  
18          can't find those registration records that are  
19          probably at those agencies.

20          I can -- we will be happy to  
21          supply you with the documentation that the  
22          Board of Health and the Board of Public Health

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1 later on, that those two Illinois agencies had  
2 a direct part in GSI safety programs and so  
3 forth.

4 CHAIRMAN ZIEMER: Yes, okay.  
5 Thank you, Dan.

6 DR. McKEEL: All right.

7 CHAIRMAN ZIEMER: Now, so I guess  
8 the task here on this one will be for NIOSH to  
9 gather that information and determine the  
10 extent, if any, that it will change their  
11 approach to dose reconstruction in terms of  
12 Appendix BB. Comment, Bob?

13 DR. ANIGSTEIN: Yes. I have two  
14 comments, one is we recently, SC&A recently,  
15 through our associate who is very intimately  
16 involved with Illinois issues, because he  
17 worked for Landauer for a long time in  
18 Chicago, and he specifically asked IEMA for  
19 records, first for licensing records for  
20 General Steel Industries or General Steel  
21 Casting, the previous name.

22 Then later, when Dr. McKeel

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1 brought up the certification issue, he called  
2 them again and said, by any chance, if there  
3 was any separate set of records for  
4 certification. Maybe they were too narrow in  
5 looking for licensing and not certification,  
6 source certification, and the answer was the  
7 same.

8           There were no records of any kind  
9 that they could find pertaining to General  
10 Steel Industries or General Steel Casting for  
11 the time period in question.

12           As far as the NRC is concerned,  
13 all I can say is -- I won't repeat what we  
14 said before, I was -- after a number of  
15 injuries from different NRC employees and  
16 officials, I was directed to the NRC Public  
17 Documents Room, which is staffed by an NRC  
18 contractor, who simply said, oh, General Steel  
19 -- I specifically asked for General Steel  
20 Industries. I didn't say GSI. I said General  
21 Steel Industries, General Steel Castings, and  
22 they said we already performed a FOIA request

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1 in 2006 with Dr. Daniel McKeel, and there were  
2 no records whatsoever.

3 So I saw no point in sending  
4 another request at that time. Why there was  
5 that confusion, I agree, there was an error.

6 CHAIRMAN ZIEMER: In any event,  
7 Dr. McKeel now has --

8 (Simultaneous speakers.)

9 CHAIRMAN ZIEMER: -- records, and  
10 so lots of follow-up is needed.

11 DR. McKEEL: Dan McKeel. There  
12 was no error. I did in fact file a FOIA  
13 request through the NRC in 2006. They said  
14 there were no such records, but I knew there  
15 must those records.

16 And really, the only logical  
17 place, having gotten the same answer that Dr.  
18 Anigstein got from IEMA on several occasions,  
19 was to go back to NRC and all I did was write  
20 a straightforward simple FOIA request, asking  
21 for those license documents, and they came  
22 back and first and said there were 600 pages,

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1 and eventually they delivered more than 1,000  
2 pages.

3 Every single record -- this is one  
4 of the few FOIAs I've ever gotten directly  
5 related to those seal source licenses. So  
6 maybe the lesson to be learned here is don't  
7 give up, it's always worth asking.

8 And as far as IEMA and records  
9 currently, I do need to point out that the  
10 Illinois State Board of Health and the  
11 Illinois Department of Public Health are two  
12 different agencies that are still in  
13 operation, and they really are not the same as  
14 IEMA and its Nuclear Safety Division.

15 So I don't really think it  
16 probably is worthwhile to go back to IEMA.  
17 But it could be if you're going to send a data  
18 capture team. But it's the other state  
19 agencies in Illinois that I think would have  
20 the registration records for radiation  
21 devices. So that would be my suggestion, to  
22 go to them.

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1                   CHAIRMAN ZIEMER:       Okay, thanks  
2       Dan. We appreciate that input. Let me also  
3       mention, I think you talked about, also, leak  
4       test records and things like that, and I think  
5       I would certainly be interested myself in what  
6       they found there, particularly since they  
7       apparently had radium sources. And radium  
8       sources, historically, have been notorious for  
9       leaking, and that would be very interesting to  
10      learn what they found on those radium sources.

11                  DR. MCKEEL:     Dr. Ziemer, I also  
12      urge again that you all go to Mallinckrodt or  
13      Tyco and see if they don't have some of those  
14      records from the Nuclear Consulting  
15      Corporation, because there's a [identifying  
16      information redacted], who headed that group,  
17      a very famous alumni of the University of  
18      Ohio.

19                  You know, I think Mallinckrodt  
20      should be able to shed some light on those old  
21      records.

22                  CHAIRMAN ZIEMER:   Okay. Well, we

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1 have that information, and NIOSH is prepared  
2 to move ahead on that. Let's move -- so that,  
3 what I've jotted down here, and sort of the  
4 task, as it were, that one's in NIOSH's hands  
5 to follow up and gather all of this  
6 information, as it may pertain to source terms  
7 and related matters.

8 The second issue that, and the  
9 agenda indicated this with a question. Do we  
10 have a final response from DOL on the issue of  
11 a start date for the covered period?

12 That was a question that was  
13 raised previously. It was kind of left up in  
14 the air that -- and I don't know if there has  
15 been an actual inquiry made.

16 Dave, can you report on that?

17 MR. ALLEN: Yes. That was brought  
18 up because of the date on one memo, you know.

19 It's debatable whether it's a stray mark or  
20 1953 changed to 1952. It's not the clearest  
21 thing in the world. As a result of a Work  
22 Group meeting, we sent a letter to the

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1 Department of Labor with that form on it, and  
2 asked them if this would change your opinion  
3 as far as the start date, and we never heard  
4 back. I don't know if we will hear back.

5 If they did have that data or that  
6 document, you know, prior to us sending it to  
7 them. We just brought it to their attention  
8 again.

9 CHAIRMAN ZIEMER: Do we expect a  
10 response or was it the type of letter where  
11 you're simply pointing it out and the ball's  
12 in their court?

13 Are we awaiting a response?

14 MR. ALLEN: We're not really  
15 awaiting a response. We can't do anything  
16 with 1952 unless DOL --

17 CHAIRMAN ZIEMER: So you've raised  
18 the issue with them?

19 MR. ALLEN: We raised the issue  
20 with them, pointed it out, handed them another  
21 copy of that document. But yes, it's in their  
22 ball court.

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1                   CHAIRMAN    ZIEMER:            Did they  
2                   acknowledge at all that they received that  
3                   information?

4                   MR. ALLEN:     That I couldn't tell  
5                   you for sure.

6                   CHAIRMAN ZIEMER:   This went to, it  
7                   would have gone to Jeff's office?

8                   MR. ALLEN:     No.     It would have  
9                   gone to -- I'm trying to think of the time  
10                  frame.    I'm not sure if it went to Rachel  
11                  Leiton or if it went to Pete Turcic, whoever  
12                  was the --

13                  DR.    NETON:            What about the  
14                  director of the program over there?    Okay.  
15                  It's typically their practice to respond to  
16                  any letter like that.    So they don't think of  
17                  something, you usually get sort of a written  
18                  response, what the results of their evaluation  
19                  was.

20                  MR. ALLEN:     Well, if we sent them  
21                  a letter that says that we say we think what  
22                  you have currently is incorrect and here's

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1       why, we will normally get a response one way  
2       or another. In this case, I think we sent  
3       them one saying here, this may be additional  
4       information. I'm not sure we really said that  
5       we believe it's '52 or '53. We just said we  
6       wanted to make sure you have this.

7                       CHAIRMAN ZIEMER: Bob, question.

8                       DR. ANIGSTEIN: I'd make an  
9       observation on that. This change, this ink  
10      mark on it just gave me the idea that maybe it  
11      was changed. But irrespective of that, we  
12      have -- there is no documentation prior to  
13      '58, except for that one cover sheet  
14      summarizing the information.

15                      So even if -- forget the ink mark  
16      -- even if that memo was written in December  
17      of '53, it does not preclude that there would  
18      -- that it doesn't tell you how long this was  
19      going on. Had it just started? Or my point  
20      was that given that the betatron was  
21      installed in early 1952, I think in January,  
22      by the Army; given that Mallinckrodt was

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1 producing in this; given that they must have  
2 been easily aware of the fact that the  
3 betatron facility existed or was used for --  
4 GSI you know, had planted the story in the  
5 local newspaper, for their publicity purposes,  
6 it is logical that it's not unlikely that they  
7 would have got the idea, hey, here's somebody  
8 30 miles away. The government owns a  
9 betatron. Why don't we take advantage of it  
10 and start using it?

11 So one thing is to be claimant-  
12 favorable. It's a strong possibility. That's  
13 all I'm saying. I'm not saying that it's  
14 true, but it is a strong possibility, and  
15 therefore they should give them that extra  
16 year, in my personal opinion.

17 CHAIRMAN ZIEMER: But that's not -  
18 -

19 (Simultaneous speakers.)

20 DR. ANIGSTEIN: I mean it could be  
21 recommended. I mean, it could have been more  
22 strong if you -- to say that when there's a

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1 recommendation. They answer more, you know,  
2 they do answer.

3 MR. ALLEN: They already took that  
4 piece of information and started the date  
5 there, because like you said, without that  
6 piece of paper, the start date would be 1953,  
7 I think.

8 (Simultaneous speakers.)

9 DR. ANIGSTEIN: But even in '58,  
10 there was an indication in the correspondence  
11 that it had been -- there had been a previous  
12 contract, and there was that one case where  
13 there is a payment, albeit a small payment.

14 They said we don't have a  
15 contract. We don't have a purchase order at  
16 the moment, but the administrative purchasing  
17 manager at Mallinckrodt said, I recommend that  
18 we pay this, because this is consistent with  
19 the previous contract. That's all we know, is  
20 that there was a previous contract.

21 MR. ALLEN: Yes, I agree. I mean  
22 the information is very limited there --

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1 DR. ANIGSTEIN: It is, it is.

2 MR. ALLEN: I think DOL certainly,  
3 you know, in my opinion, they were -- they  
4 didn't require documentation in '54, '55, '56,  
5 even though it looks like it was like  
6 restarting in '58-ish.

7 DR. ANIGSTEIN: Yes. But the '53  
8 simply said -- the '53 or '52 memo, depending  
9 on the date, simply said "Regarding the  
10 radiography, betatron radiography" or  
11 something like that, of Mallinckrodt, Inc. by  
12 General Steel Casting, right.

13 MR. ALLEN: Yes, something to that  
14 effect. It's everyday, and they apparently  
15 took that information and that's what they  
16 used to create the start date.

17 DR. ANIGSTEIN: Well, actually DOE  
18 took that information, a gentleman by the name  
19 of [identifying information redacted],  
20 [identifying information redacted]. I believe  
21 that was his name. No, that was California.

22 I forget his name, but -- I even

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1 met him. Anyway, and he simply took that and  
2 said "Well, it's been going on since '53," and  
3 DOL picked up on that. But the idea at that  
4 time, his point was simply to get the survey  
5 date.

6 CHAIRMAN ZIEMER: Well, okay. We  
7 can't do anything more about that. I guess I  
8 don't know if there's any point in going back  
9 to Labor. You've sent them the information.  
10 I guess I'd be more comfortable if we knew  
11 that they actually received it.

12 MR. ALLEN: I'll look. I don't  
13 know the administrative process on that.

14 CHAIRMAN ZIEMER: I don't either.  
15 I don't know if it's something that can be  
16 checked out.

17 MR. KATZ: It certainly can't hurt  
18 to send them an email and ask them --

19 DR. NETON: Well, we have biweekly  
20 phone calls with them.

21 (Simultaneous speakers.)

22 CHAIRMAN ZIEMER: Okay. So that

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1 will be simple. I'll just make a note, "NIOSH  
2 to confirm that they received it." Now Issues  
3 3 to 11, if you look at the matrix, you'll see  
4 basically the same answer from NIOSH for every  
5 one of those issues.

6 It has to do with the film badge  
7 data and the modeling. I guess that now, and  
8 also sort of the source terms are part of  
9 that. But I -- just for these issues, it's  
10 sort of going to be somewhat like Issue 1.  
11 It's going to be impacted or not by what you  
12 find as you pursue the other information.

13 So in my mind, we have to keep  
14 these issues open until we get the results of  
15 the new film badge and new source term data,  
16 to see if that will impact on the model.

17 MR. ALLEN: I agree.

18 CHAIRMAN ZIEMER: Any other  
19 comments on that, Issues 3 to 11?

20 MEMBER MUNN: No, but I do have  
21 one general comment that has to do with the  
22 matrix itself. Would it be possible for us to

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1 begin to date these responses and --

2 CHAIRMAN ZIEMER: Exactly. In  
3 fact, I had exactly the same notation for  
4 myself to bring up. When a response is made,  
5 and it's sort of like what you're doing in the  
6 matrix for the procedures, to indicate the  
7 dates that the response was made, so that we  
8 have an idea as we progress through this -- is  
9 this something really current?

10 I mean when you start to look at  
11 all the different facilities in the matrices,  
12 it's very easy to lose track of, is this an  
13 old reply that's been sitting on the table for  
14 a long time? The only way you find that out,  
15 you keep going back to earlier versions and  
16 see when it appeared.

17 But it would be very convenient  
18 just to have that on the matrix, where it says  
19 "NIOSH response" as of a certain date. SC&A  
20 reply of a certain date and so on. In some  
21 cases we have that, but like on our current  
22 matrix -- yes.

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1 DR. ANIGSTEIN: The one that I  
2 sort of took it on myself to send out a  
3 revised version of the matrix, the issues  
4 matrix and SBD, and on the cover page, the  
5 main reason for it was the cover page gives a  
6 history.

7 We have the original date, May  
8 2nd, 2008. NIOSH response is June 19th, 2008  
9 and reissued, because that's when I sent it  
10 out, December 8th, 2009, but there were no  
11 substantive changes to it.

12 CHAIRMAN ZIEMER: Okay. But what  
13 happens is that you end up with the matrix --

14 DR. ANIGSTEIN: I think you're  
15 looking at the SEC petition matrix. I'm  
16 talking about the Appendix BB matrix.

17 CHAIRMAN ZIEMER: Okay. But you -  
18 - yes, that's one where you have done that.

19 DR. ANIGSTEIN: Just now. We just  
20 now did that.

21 CHAIRMAN ZIEMER: Yes. But here  
22 on the appendix, or on the petition matrix, we

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1 don't have those dates. We just need to be  
2 consistent.

3 DR. ANIGSTEIN: What I would  
4 suggest though, and if John agrees, is that we  
5 change the format of the matrix and simply  
6 have a little box.

7 CHAIRMAN ZIEMER: Yes, whatever.

8 DR. ANIGSTEIN: When NIOSH adds a  
9 response, they put, they type in the date.  
10 When SC&A replies to the NIOSH response, we  
11 type in the date.

12 CHAIRMAN ZIEMER: I think that's  
13 all you're asking for.

14 MEMBER MUNN: That's the simplest  
15 way.

16 (Simultaneous speakers.)

17 CHAIRMAN ZIEMER: Right, right.

18 MEMBER MUNN: Exactly, yes. Right  
19 after NIOSH --

20 CHAIRMAN ZIEMER: It would be very  
21 helpful. It would be very helpful. So Issues  
22 3 through 11 we'll await input. Issue 12.

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1 That is -- I just put a comment here. It  
2 appear to me to be the same as Issue 6 of TBD-  
3 6000. That's the resuspension issue.

4 So, and that item's been  
5 transferred to the Procedures Group. I don't  
6 know if we need to specifically transfer this  
7 item as well, or if we just put it in abeyance  
8 awaiting the outcome.

9 MEMBER MUNN: Regulation of Issue  
10 6, as it refers back to 6, then just in  
11 abeyance for that reason.

12 CHAIRMAN ZIEMER: Is that  
13 agreeable, or do we need to formally transfer  
14 this as well?

15 MEMBER MUNN: The same issue.  
16 It's going to be worked the same time period  
17 or the same --

18 CHAIRMAN ZIEMER: Right. Well,  
19 I'm asking do we need to formally transfer  
20 this one or do we just let it sit, with the  
21 understanding that whatever the outcome of the  
22 other, we'll make this outcome.

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1                   MEMBER MUNN:     In my opinion, a  
2                   notation needs to be made that it's in  
3                   abeyance awaiting the closure of Issue 6.

4                   CHAIRMAN ZIEMER:   Okay.  Is that  
5                   agreeable?  Any objections?

6                   MEMBER BEACH:           Awaiting the  
7                   closure of Issue 6 or Issue 1?

8                   CHAIRMAN ZIEMER:   Issue 6 of the  
9                   other matrix.  That's the overriding -- it's  
10                  the TBD-6000 matrix, and that was on the other  
11                  matrix.  It was Issue 6.

12                  (Pause.)

13                  CHAIRMAN ZIEMER:   Okay.  Then the  
14                  last one here, the last -- well, a couple more  
15                  items.  I had here follow-up on new  
16                  information provided by the petitioner.  We  
17                  actually have already discussed that.

18                  MR. KATZ:         Can I just ask a  
19                  question?  Going back to the 12 and 6, which  
20                  are identical but two different matrices, and  
21                  have been transferred to the Procedures, is  
22                  there any work that needs to be undertaken,

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1 for that Subcommittee to be able to address  
2 and close that issue?

3 CHAIRMAN ZIEMER: Well, I have  
4 formally transmitted by email using the  
5 format.

6 MR. KATZ: No, I understand that.

7 CHAIRMAN ZIEMER: So it's  
8 transmitted. So the answer is what?

9 MEMBER MUNN: It will be covered  
10 under DID-70.

11 (Simultaneous speakers.)

12 CHAIRMAN ZIEMER: And that's in  
13 process.

14 MR. KATZ: Okay. Okay, good. I  
15 just wanted to -- didn't want time to go by if  
16 something could be done towards --

17 (Simultaneous speakers.)

18 CHAIRMAN ZIEMER: It's system-  
19 wide. So you have this one, which is the same  
20 as the 6000 one, which is the same as the  
21 other TBD. It's all the same issue.

22 MR. KATZ: Thanks.

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1                   CHAIRMAN ZIEMER:   And it comes up  
2                   repeatedly, and SC&A has been consistent when  
3                   they find this issue of raising it basically  
4                   for us in an identical way, yes.

5                   A final one here, and then we'll  
6                   break for lunch, a preliminary report on  
7                   interview of a site expert.   At our last  
8                   meeting, we talked about the possibility of  
9                   sort of independently reconfirming the size of  
10                  some of those sources, particularly the 80  
11                  curie, by knowing something about the rope-off  
12                  distance that was used to achieve the two mR  
13                  per hour.

14                  Dr.       McKeel       and       Mr.       Dutko  
15                  subsequently came up with the name of an  
16                  individual that they thought might be able to  
17                  help with that.   I have contacted that  
18                  individual and conducted a phone interview,  
19                  and I've committed to that individual that I  
20                  would send back the written report to him, so  
21                  that he can confirm that I've characterized  
22                  the interview correctly before I distribute it

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1 to anybody.

2 So I just want to confirm to you  
3 that I have conducted that interview. I've  
4 written up a report, and it will await the  
5 approval of the individual, that I have  
6 correctly characterized our discussion.

7 Then at that point, I will share  
8 that with the group or with the Work Group and  
9 with the petitioners. But basically, that  
10 will be an added piece of information that we  
11 can put in the mix with the other new  
12 information that we're talking about.

13 I think with that, we will recess  
14 for lunch, and then immediately after lunch,  
15 we will begin our discussion on the GSI  
16 petition and the petition matrix that you all  
17 have. We had an initial discussion on that  
18 last time, and we will get into a little more  
19 depth on that now. So we'll reconvene at  
20 1:30.

21 MR. KATZ: Can you try to get back  
22 earlier?

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1                   CHAIRMAN ZIEMER:    Yes.    Maybe we  
2    can get back by 1:15.    Let's try for 1:15.  
3    That will give us just under an hour, but I  
4    think we can do that, yes.    So and for those  
5    folks on the phone then, we'll recess until  
6    1:15 local time here, which I guess is 12:15  
7    out in the -- for folks out in the Midwest.

8                   MR. KATZ:    Thank you everyone on  
9    the phone, and we'll rejoin you this  
10   afternoon.

11                   (Whereupon,    the    above-entitled  
12   matter went off the record at 12:20 p.m. and  
13   resumed at 1:20 p.m.)

14  
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1 the last couple of days some concerns about  
2 the matrix issues.

3 Some of those overlap into items  
4 we discussed with regard to the main matrix as  
5 well. Then we want to identify what the path  
6 forward is on each of these items. That is,  
7 whether additional work needs to be done, or  
8 whether we are in a position to close any of  
9 them out.

10 There's ten issues in the matrix  
11 for the Special Exposure Cohort Evaluation  
12 Report review. So let's step through each of  
13 those and see where we are. On the first  
14 issue was the issue entitled Lack of Radiation  
15 Monitoring Data, and there were issues raised  
16 about some incidents on the site.

17 We also obtained some additional  
18 incident information, I believe, which was  
19 supplied by Dr. McKeel or Mr. Ramspott. But  
20 we had some additional information there as  
21 well.

22 SC&A -- or NIOSH indicated that

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1 they accommodate the known incidents because  
2 they can specifically deal with those, and, in  
3 fact, have already, I think, incorporated  
4 specifics of one case where a dose  
5 reconstruction was done.

6 So in general, if they know about  
7 specific instances, I think the general  
8 question being raised was was there a plethora  
9 of incidents that perhaps weren't recorded and  
10 might impact on how one goes about a general  
11 dose reconstruction, although that is sort of  
12 a generic question that one could raise  
13 anyway, I suppose.

14 I mean the general approach for  
15 reconstructing dose, where you use a model  
16 typically doesn't assign general incidents  
17 outside of known parameters, as far as I am  
18 aware. But nonetheless that's an issue that  
19 can be discussed, and I don't know if I fully  
20 characterized those.

21 But I think the SC&A concern was  
22 what do you do about -- how do you capture

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1 this in the overall scheme of things.

2 DR. ANIGSTEIN: I mean the problem  
3 with this is two-fold. One is the years, well  
4 the Issue 1. There's another issue -- go in  
5 order -- Issue 1 is -- to '63, where there is  
6 no monitoring -- we have no film badge data.

7 CHAIRMAN ZIEMER: Although we may  
8 end up getting it.

9 DR. ANIGSTEIN: We may end up.  
10 But I mean at the moment, there is no film  
11 badge data, and therefore we can certainly  
12 make estimates based on knowledge of the  
13 application of the process knowledge. We can  
14 make some estimates of the exposures from  
15 routine operations. But they cannot encompass  
16 the incidents.

17 The recurring theme, which is  
18 mentioned -- I'll mention it here because it's  
19 relevant to our discussion later, is the  
20 dichotomy of the two classes of workers, the  
21 workers who -- the betatron operators and  
22 other, and I guess by extension other isotope

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1 operators, even though Appendix BB does not  
2 even refer to them.

3 And put into that category would  
4 be the workers who worked on the casting  
5 immediately after radiography, that they will  
6 be getting some exposure to the short-lived  
7 activation product in the castings.

8 So they are assigned one category,  
9 and then everyone else in the plant is  
10 assigned a different category, as far as dose  
11 assignment. And here are examples of  
12 incidents which involved non-radiation workers  
13 and non-steel repair workers, shall we call  
14 them.

15 So they would not have been  
16 covered by even the routine high elevated  
17 exposures as the betatron -- the radiation  
18 workers, put them in that category, were  
19 assigned. So that's one concern.

20 CHAIRMAN ZIEMER: But it seems to  
21 me you have that kind of concern on any site  
22 where you're doing this kind of dose

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1 reconstruction. Number one, unless you  
2 operate under the assumption that incidents  
3 were, like, a daily occurrence, which I  
4 suppose you couldn't rule out --

5 DR. ANIGSTEIN: No.

6 CHAIRMAN ZIEMER: But an incident  
7 by its very nature generally calls attention  
8 to itself in some way or another. I mean the  
9 very nature of what do you mean by an  
10 incident.

11 It's something that occurs that's  
12 out of the ordinary. The cases that we know  
13 of were always cases where something occurred  
14 that caused people to make note of it.

15 DR. ANIGSTEIN: Yes.

16 CHAIRMAN ZIEMER: So otherwise, I  
17 don't think we're generally trying to assign  
18 doses based on well, so let's assume so many  
19 incidents a week or something like that. I  
20 don't think we ever do that. And it's  
21 certainly true that any of the dose  
22 reconstruction approaches, there's always an

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1 outside chance that someone could have been  
2 missed.

3 But what you're trying to do here  
4 is minimize that by the claimant-favorable and  
5 other assumptions that say okay, maybe we  
6 didn't account for every possible thing,  
7 because any time you mention something's  
8 possible, I can think of something else that's  
9 worse.

10 DR. ANIGSTEIN: Yes, sure.

11 CHAIRMAN ZIEMER: So I don't know  
12 how you handle that. But I think the first  
13 thing you have to do is say -- and the issue  
14 of dividing people up, I think, is a separate  
15 thing from incidents.

16 I mean it's -- well, regardless of  
17 what you say about incidents, if there are  
18 two classes of workers that you clearly can  
19 identify, then it's reasonable to assign  
20 those.

21 We've done that in other places,  
22 and that's not an unreasonable thing to do.

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1 Now and then if incidents occur, you can do  
2 special mock-ups, dose reconstructions,  
3 whatever, for those cases. But otherwise,  
4 what do you do?

5 DR. MAURO: See, when I look at  
6 all the sophistication that was brought to  
7 bear on this problem, especially the way the  
8 betatron was modeled, the MCMP --

9 COURT REPORTER: Mr. Mauro,  
10 please.

11 DR. MAURO: Sorry, I'm sorry. I  
12 know a lot of attention, a lot of discussion  
13 was directed toward how do you deal with some  
14 of these more complex physics problems. When  
15 I looked at this thing, I said wait a minute,  
16 I have a site here, where I -- and I said this  
17 before -- where people are using radioactive  
18 sources of various sizes to do non-destructive  
19 testing, and that went on for ten years, from  
20 '53 to '64 without any film badges, and we  
21 don't have a record of incident reports.

22 We don't have anything. We have

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1 nothing. That's what I'm hearing. We have  
2 nothing. What we do know, for ten years  
3 people are working out there in a setting  
4 where non-destructive testing of radioactive  
5 source is going on.

6 I have to tell you something. I  
7 don't need to hear any more. You can't  
8 reconstruct doses. I mean I'm sorry to say it  
9 so blatantly, but I've never seen a situation  
10 like this.

11 Could you imagine working for ten  
12 years in a place that's handling these large  
13 sources, doing non-destructive testing, which  
14 is historically known to be a place where it's  
15 not uncommon for a source to be stuck in an  
16 open position, where people, where you may put  
17 up a boundary and people cross the boundary?  
18 It could be done under highly controlled  
19 conditions or in less than controlled  
20 conditions.

21 The whole business of non-  
22 destructive testing using sources is filled

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1 with these stories, and not to even have film  
2 badges on the workers, that's where the  
3 problem lies. So I mean we'll work out our  
4 differences on the betatron. I have no doubt  
5 about that.

6 But I don't know. What do you do  
7 when you have ten years of people working in  
8 non-destructive testing and then you don't  
9 have any film badge record?

10 DR. ANIGSTEIN: And even if they  
11 get -- even if they dig up the film badge  
12 records, I mean I'm just speculating here, the  
13 very first set of film badge records that we  
14 do have are the first few weeks of 1964, and  
15 it goes back to the last six weeks of '63. We  
16 don't have the records, but we know it starts  
17 out with Badge No. 7 in the first week of  
18 January.

19 That's a handful of people.  
20 That's 18 people. So it seems unlikely -- or  
21 maybe 17. But it seems unlikely that the  
22 earlier years, there would have been more. So

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1 we're, again, talking about plants with  
2 thousands of workers, and a minuscule  
3 fraction, true, those that are considered to  
4 be at highest risk.

5 But here, we have, again,  
6 incidents to people who even if we dig up the  
7 film badge records from those days, to -- film  
8 badge records from those people because they  
9 were not badged. They were not considered  
10 radiation workers, and -- as John pointed out.

11 Then the idea that this: .72 mR  
12 per hour is assigned based on that the only  
13 radiation -- I mean, the model -- in Appendix  
14 BB the only radiation source is the betatron,  
15 and the only exposure to the non-radiation  
16 workers is the highest skyshine dose from the  
17 betatron, which is calculated at .72 mR per  
18 hour.

19 That simply does not apply when  
20 you have these sources out in the open, with  
21 perhaps the tape, you know, a rope around  
22 them, a roped off area, where we have now,

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1 again, anecdotal reports of a building that --  
2 a cinder block structure in Building 6, and as  
3 I said, the workers would actually -- we don't  
4 know exactly how high that wall is, but --  
5 they would stand on tiptoe or jump up because  
6 they were curious to see what was going on  
7 inside.

8           Again, these were non-radiation  
9 workers. Radiation workers probably would  
10 have known better. So that particular dose  
11 assignment just, to my mind just does not seem  
12 that it's -- sure, you can assign the same  
13 thing to the manager's secretary that never  
14 sets foot inside the plant, and that's  
15 probably overkill.

16           But on the other hand, that -- I  
17 mean I saw a dose reconstruction of one of the  
18 cases I reviewed, where because he was  
19 considered a maintenance man, I mean, again,  
20 the deceased worker, his daughter, I think,  
21 filed a claim, and it says well, he was a  
22 maintenance man. He worked all over the

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1 plant.

2 So therefore, he was not assigned  
3 the radiation workers' dose, but the  
4 maintenance man could have been repairing the  
5 machinery on top of the betatron building; he  
6 could have been repairing cranes or working or  
7 operating cranes.

8 It's a very, very nebulous  
9 situation. So that's -- I'm just elaborating  
10 on what John said.

11 CHAIRMAN ZIEMER: You know, you've  
12 got to think about some reasonableness, too.  
13 For example, there's nobody that's going to be  
14 jumping up ten hours a day for a year looking  
15 over a fence. They might do that for a couple  
16 of minutes out of their whole work year. But  
17 I can't get too excited about that.

18 Now if they're working up on the  
19 rooftop every time that source is out, that's  
20 another thing. Even that's probably an  
21 extreme. So I think we have to look at the  
22 reasonableness.

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1                   But one of my questions at this  
2 point is that in light of the fact that there  
3 may be now more film badge data, which would  
4 enrich our ability to look at those years, as  
5 well as some other source issues, can we even  
6 close this at this point? Or does that need  
7 further input?

8                   And in the cases you're talking  
9 about, Bob, I don't regard those as incidents.  
10 An incident is something like the guy takes  
11 the source home in his pocket. That's an  
12 incident.

13                   Or somebody has breached some kind  
14 of lead boundary, and, I mean, these cases  
15 that people have found and the folks haven't  
16 been badged, but they know it occurred because  
17 there was a specific -- I mean it's not like  
18 somebody got up to the edge and said I wonder  
19 what's going on and stepped up and looked in  
20 and that's an incident. There's no way that  
21 that's going to contribute anything, even in a  
22 high beam, of significance where they're

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1 working.

2                   So we're talking about cases where  
3 something significant, and generally, and I  
4 don't know that you can go beyond this.  
5 Generally you know though, that -- Dave, you  
6 had a comment first, right?

7                   MR. ALLEN: I forgot where I was  
8 now. It was a while back.

9                   CHAIRMAN ZIEMER: But I'm  
10 wondering on this particular -- the finding is  
11 lack of monitoring data. We don't know that  
12 that's going to be the case anymore. So I'm  
13 wondering if we should keep this open until we  
14 -- I mean we can sit here and discuss how you  
15 model this vacuum of information, and it may  
16 not be fruitful to even talk about it yet  
17 until we see what else is out there.

18                   DR. ANIGSTEIN: I tend -- again,  
19 to repeat the comment. Lack of monitoring  
20 data, even if more data occurs, it will be for  
21 a very tiny fraction of the workers, and the  
22 large number that could have had some

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1 incidents of exposure, there's still no  
2 monitoring data. So we have to go with the  
3 model --

4 CHAIRMAN ZIEMER: Understood,  
5 understood.

6 DR. ANIGSTEIN: But it's not a  
7 question --

8 (Simultaneous speakers.)

9 CHAIRMAN ZIEMER: -- there's a  
10 reasonableness to -- still have the monitored  
11 workers, even if somebody wandered through an  
12 area at one time, you know, you get my point.

13 DR. ANIGSTEIN: Yes.

14 CHAIRMAN ZIEMER: I think a  
15 reasonableness. Now, true, you have to say  
16 okay, is this both reasonable and is it  
17 claimant-favorable that maybe, maybe this guy  
18 or somebody would have done this on a regular  
19 basis. I don't know. But what's reasonable  
20 to assume on those kinds of things? Jim, you  
21 have a comment?

22 DR. NETON: No. I was just going

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1 to point out that, you know, I was just  
2 looking through the index of documents that  
3 Dr. McKeel provided us. There's a good amount  
4 of information in the 1962 time frame about  
5 their license with these sources, inspections,  
6 some non-compliances that were identified, and  
7 General Steel's response to those non-  
8 compliance issues.

9 So I think we need to take a look  
10 at that to see, you know, how that might  
11 affect our opinion on doing the reconstruct  
12 doses in this era. There's inspection reports  
13 and surveys taken.

14 CHAIRMAN ZIEMER: Well, it  
15 certainly might inform us on this first issue.

16 So if it's agreeable, let's just hold this  
17 open and see. I don't see any way to close  
18 this at this point with that other information  
19 hanging out there, and maybe it will inform  
20 us, maybe not.

21 But it certainly looks like it has  
22 the potential, particularly if there's some

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1 independent inspections, which it appears  
2 there might have been. And incidentally, I  
3 will tell you without going into detail that I  
4 did ask the individual I talked to about  
5 inspections, and he acknowledged to me that  
6 there were.

7 That individual told me he wasn't  
8 privy to the outcomes. That is, they didn't  
9 -- he didn't get the reports. But he  
10 acknowledged that there were inspections. So  
11 we know that somebody was in there looking at  
12 that operation. That would be very helpful to  
13 --

14 DR. ANIGSTEIN: Oh, extremely.

15 DR. McKEEL: Dr. Ziemer, this is  
16 Dan McKeel.

17 CHAIRMAN ZIEMER: Yes, Dan?

18 DR. McKEEL: There is a lot of  
19 information, letters back and forth between  
20 the AEC officials who did the inspections and  
21 GSI about what they found and the responses  
22 that GSI made to indicate that they either had

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1 or were going to correct those deficiencies.

2 The other thing about monitoring  
3 data is there is a Nuclear Consultants  
4 Corporation radiologic survey of both inside  
5 and the area around the Building 6 radiography  
6 facility including the roof by [identifying  
7 information redacted], and that's used --  
8 actually, that report is included in every  
9 license up until the renewal in 1972 that  
10 actually extended to '77 and then was  
11 terminated when the plant closed in January of  
12 '74.

13 So that radiologic survey, there  
14 are two tables that give -- so that should be  
15 very helpful. That's direct information.  
16 There are more drawings of that building and  
17 distances from various work areas, and even  
18 some estimates of how many workers were in  
19 those work areas.

20 So that's a very useful report.  
21 It gives the dimensions of the facility, which  
22 differs from the dimensions that the workers

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1 indicated in their testimony. But I do think  
2 it's important to look at all that information  
3 and see if any of the Picker badges or the NCC  
4 badge data can be retrieved.

5 CHAIRMAN ZIEMER: Okay. Good  
6 comment, Dan, and I certainly agree with that.

7 So we'll keep this issue open until we have a  
8 chance to dig into that new information. Just  
9 looking on the matrix, it occurs to me that  
10 Issue 2 may be somewhat similar. It's  
11 incomplete monitoring of workers from '64 to  
12 '66.

13 So it's sort of the same question  
14 in a different time frame. So if it's agreed,  
15 we'll keep Issue 2 open as well until we get  
16 this new information. Did we confirm that  
17 Mark was back on the line after lunch?

18 MR. KATZ: We did not confirm, but  
19 we have --

20 MEMBER GRIFFON: I am. I've been  
21 on the call.

22 MR. KATZ: Okay. The numbers were

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1 right, so I --

2 CHAIRMAN ZIEMER: Thank you, Mark.

3 Just wanted to make sure. Let's go on to  
4 Issue 3. Issue 3 had to do with lack of  
5 documentation. Part of this was whether or  
6 not there was radiography done prior to, was  
7 it '58? Then let's see what -- NIOSH said  
8 there was no indication of radiography prior  
9 to '58.

10 I think, SC&A, you ask about  
11 uranium work prior to '58. Again, this one  
12 has to do though with -- let me --

13 MR. ALLEN: I might be able to  
14 help you clarify --

15 CHAIRMAN ZIEMER: I'm refreshing  
16 my memory here on what this one covered.  
17 Exposure from '53 to '58 is the focus, I  
18 guess, right?

19 MR. ALLEN: We had the documents.  
20 We had the purchase orders starting in '58  
21 on, if I remember right, it was essentially  
22 man hours.

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1 DR. ANIGSTEIN: Yes, they were man  
2 hours.

3 MR. ALLEN: Of X-ray and uranium.

4 DR. ANIGSTEIN: Not man hours;  
5 hours. So that would be like they rented the  
6 facility for so many hours.

7 MR. ALLEN: So we had the purchase  
8 orders from Mallinckrodt to GSI for starting  
9 in '58 through the end of June '66, and in the  
10 Appendix, we reviewed what those hours were,  
11 and they tapered off after, I think, '64-ish.  
12 I don't remember the exact date.

13 DR. ANIGSTEIN: Yes.

14 MR. ALLEN: They started tapering  
15 down towards the end, and in the appendix we  
16 used the, I don't know if it was the '58 or --  
17 we used one of those earlier higher numbers on  
18 hours, and just extended that back through the  
19 earlier years.

20 DR. ANIGSTEIN: You used the first  
21 one, the first '58 report.

22 MR. ALLEN: All the way, and

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1 assumed they were X-raying uranium at that  
2 pace from '53 on.

3 DR. MAURO: This is a betatron  
4 issue. In other words, when do you start?  
5 What do you assume --

6 MR. ALLEN: How much uranium was  
7 worked.

8 DR. ANIGSTEIN: Well, it's a  
9 uranium exposure issue, actually, because the  
10 betatron, they got exposed whether they were  
11 doing uranium or not.

12 MR. ALLEN: Right, and part of the  
13 justification for that was it looks like the  
14 documentation, there's some from February of  
15 '58, but the purchase orders actually start  
16 March of '58, and it looks like they're  
17 restarting some process at that point.

18 How intensive the earlier process  
19 was is not sure. But it looks like it was  
20 high and tapered off. That's why, part of why  
21 we made that assumption that it was consistent  
22 at that higher level. So to put words in your

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1 mouth, the SC&A comment was they had no  
2 documentation to back that up essentially.

3 DR. ANIGSTEIN: No. I mean the  
4 basic point is, you know, I agree completely  
5 with what Dave said, is the period we know we  
6 have data, have the purchase orders, '58 to  
7 '66. Fifty whatever, '52 or '53, as it may  
8 turn out to be, just my opinion -- it's a  
9 black hole. I mean it's a dark age. There  
10 could have been very little; there could have  
11 been very much, and there is just no  
12 knowledge.

13 So it's a -- so I'm saying to  
14 simply take the very first purchase order  
15 covered I think a three-month period, and  
16 simply say this is sufficiently conservative  
17 and claimant-favorable to extend it all the  
18 way back to the beginning, and if I was asked  
19 my opinion, I don't know.

20 DR. McKEEL: Dr. Ziemer, may I  
21 make a comment?

22 CHAIRMAN ZIEMER: Yes, Dr. McKeel.

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1 DR. McKEEL: In the NRC FOIA  
2 information, starting with the first license  
3 for the small cobalt-60 sources in 1962, one  
4 of the things they do is give a biography, a  
5 little biosketch of the work history and  
6 training of each of the radiographers by name.

7 The two longest or two of the most  
8 experienced, it says in 1962 that their work  
9 experience with the 24 MeV betatron and the  
10 radium sources -- ten years.

11 That would take that back to  
12 around 1952. There are other comments in the  
13 narrative that accompanies the licenses, where  
14 actually they say that radiography has been  
15 going on at GSI, and this is written in 1962,  
16 for the past 20 years.

17 When I saw that, I did a triple-  
18 take, and that statement recurs several times,  
19 and that would put it back to 1942. In  
20 addition to that, there are two documents that  
21 actually do indicate that betatron work was  
22 going on at GSI as early as 1953.

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1           One of those is the original  
2 Mallinckrodt Chemical Works matrix, the NIOSH  
3 report that describes betatron slices being  
4 made at Mallinckrodt in 1953. Then there is a  
5 Mallinckrodt AEC technical report, NYO-1358,  
6 where they're describing examination of some  
7 early ingots or ingots, and they mention that  
8 three of them were examined with the Betatron.

9           Now interestingly, they don't say  
10 with a GSI betatron. But the only way I can  
11 interpret that statement is either there was a  
12 betatron at Mallinckrodt, which nobody has  
13 heretofore identified, or they were talking  
14 about sending it over to GSI and examining it  
15 with the GSI betatron.

16           So there are those references and  
17 allusions to radiography work at GSI from '53  
18 forward, and there are a couple of comments,  
19 not fleshed out, that radiography work was  
20 going on there for 20 years. So that record  
21 is much richer by these new documents, and I  
22 really think that they should be looked at and

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1 examined before concluding this issue.

2 CHAIRMAN ZIEMER: So this appears  
3 then to be another case where we should hold  
4 this issue open and have the opportunity to  
5 look at that new information to see what it  
6 informs us of, in terms of those earlier  
7 years.

8 I was little surprised about the  
9 20 year thing because if you go back to '42,  
10 I'm not sure there were radiography sources  
11 available for public use in the 40s.

12 MEMBER MUNN: Not very many, and  
13 if there were, they probably were not being  
14 used in a betatron.

15 CHAIRMAN ZIEMER: Well, yes. I  
16 think he was talking about general  
17 radiography. But betatrons is --

18 DR. ANIGSTEIN: The betatron was  
19 installed in '52. That we know.

20 DR. McKEEL: No, no. I'm talking  
21 about --

22 CHAIRMAN ZIEMER: He's talking

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1 about '42.

2 DR. McKEEL: I'm talking about  
3 radium sources.

4 DR. ANIGSTEIN: And if they had  
5 radiography --

6 CHAIRMAN ZIEMER: They could have  
7 had radium sources.

8 DR. McKEEL: There are no radium  
9 source licenses with the material I got.

10 CHAIRMAN ZIEMER: Well, radium was  
11 not a licensed material.

12 DR. McKEEL: Okay.

13 CHAIRMAN ZIEMER: NRC did not  
14 exercise jurisdiction over radium until within  
15 the last few years actually. It was always  
16 unlicensed because it's not byproduct  
17 material, it's naturally occurring. Some  
18 states, such as Illinois, at some point  
19 exercised jurisdiction over radium. But  
20 certainly not in '42.

21 DR. McKEEL: Dr. Ziemer, the  
22 reason I think that somebody exercised control

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1 over it was because part of the rationale in  
2 the 1962 GSI byproduct materials license  
3 application was that they had been using the  
4 radium-226 sources with the fishbowl  
5 technique, and that that had been deemed too  
6 dangerous.

7 So either NRC, you know, AEC then,  
8 or the Illinois state agencies who were  
9 overseeing them with [identifying information  
10 redacted], must have told them to stop using  
11 those radium sources.

12 CHAIRMAN ZIEMER: Yes, one other  
13 thing that occurs. If a licensee, an NRC or  
14 AEC licensee, had radium in their mix, the NRC  
15 or the AEC's limits and requirements for  
16 byproduct material were extended to the  
17 radium. That is, dose limits for workers and  
18 so on would include both.

19 But as far as licensing, the  
20 licenses themselves never covered the radium.

21 But in the 60s, certainly the state would.  
22 I'm just saying, if -- you referred to early

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1 radiography in the 40s -- If that was done  
2 with radium, probably it was just done,  
3 because I don't think even the state exercised  
4 jurisdiction in those days on radium. It  
5 would be very rare.

6 But no. The bottom line is here  
7 we, this is another one where we need to see  
8 this new documentation to inform this issue.

9 DR. MAURO: I'd just like to add  
10 though, it's my understanding that what makes  
11 this an AWE facility is that it received a  
12 contract to do radiography on uranium, and --  
13 now there may have been commercial radiography  
14 going on at the facility before 1953.

15 DR. McKEEL: Right.

16 DR. MAURO: So let's make sure we  
17 don't lose sight of that. It has nothing to  
18 do with this.

19 CHAIRMAN ZIEMER: Nothing to do  
20 with this.

21 MEMBER MUNN: With the AWE status.

22 CHAIRMAN ZIEMER: That's correct.

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1 DR. ANIGSTEIN: You could not do  
2 radium radiography of uranium slices.

3 CHAIRMAN ZIEMER: Right.

4 MR. RAMSPOTT: Dr. Ziemer, this is  
5 John Ramspott, if I may?

6 CHAIRMAN ZIEMER: Yes, John.

7 MR. RAMSPOTT: All this new source  
8 information, which is now confirmed black and  
9 white AEC documents, also adds a lot more  
10 importance into the badge information, where  
11 there's no badge information during this now-  
12 proven early period, where there were a lot of  
13 sources there.

14 CHAIRMAN ZIEMER: Right. Thank  
15 you, John.

16 MR. RAMSPOTT: I wanted to call  
17 that -- and then the other thing that's pretty  
18 important about the sources, primary work at  
19 GSI in some of those earlier years was Army  
20 work, as documented by who owned the betatron,  
21 who owned, you know, the work they did for the  
22 Navy with the, I guess, Electric Boatworks.

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1           Those sources, they may have been  
2           limited, but I would think the Navy and the  
3           Army could probably get them if they wanted  
4           to. Thank you.

5           CHAIRMAN ZIEMER:     Okay, thanks.  
6           So we'll keep Issue 3 open, pending the look  
7           at the new information. Issue 4 is film badge  
8           dosimetry dependence on photon energies and  
9           exposure geometry. This is a more generic  
10          issue. I do want to ask, is this issue one  
11          that is also appearing in other evaluations,  
12          John? This is not specific to GSI.

13          DR. MAURO:     A recurring theme is  
14          the adjusting factors that need to be applied,  
15          and I believe that's what this comes into,  
16          which is it's a tractable problem.

17          CHAIRMAN ZIEMER:     Yes, but I'm  
18          asking whether or not this general issue is  
19          being reviewed in other procedures or TBDs?  
20          Did it come up in the Procedures Review Group?

21          MEMBER MUNN:     I believe it's one  
22          of our overarching issues, is it not?

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1 DR. NETON: Well, it's an  
2 overarching issue, but we've been dealing with  
3 it on a case-specific basis. For example, we  
4 have a TIB now to account for the response of  
5 film badges to glove box operations.

6 MEMBER MUNN: Glove boxes, yes.

7 DR. NETON: And I recall a dose  
8 calculation we did for a spill of a source at  
9 Mallinckrodt, and the relation of that source  
10 term to the film badge on the torso. But it's  
11 not possible to come up with a generic  
12 solution to all these issues.

13 If you have a unique exposure  
14 geometry that can be identified, then we will  
15 accommodate it or deal with it in some way.  
16 So that's where we're at with this particular  
17 situation.

18 DR. ANIGSTEIN: Now the aspect of  
19 it that is unique to GSI, the reason it comes  
20 up here, is the particular scenario or  
21 particular exposure source where the operator  
22 primarily has his back to the betatron

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1 apparatus after it's been shut off.

2           Incidentally, we have come up,  
3 well my colleague, Joseph Zlotnicki, came up  
4 with the first plausible explanation I got of  
5 the source of this residual radiation. With  
6 the MCMP work, we have pretty much established  
7 that it's not activation, that it's not the  
8 activation of the aluminum cone because the  
9 MCMP-X specifically models that, and it finds  
10 very little activity in the aluminum.

11           However, Joe Zlotnicki came up  
12 with the most plausible thing, and that is in  
13 the betatron, you have a 70 kV accelerating  
14 potential.

15           The first thing that happens is  
16 the beam, the electron beam gets accelerated  
17 to 70 kV. Then the magnetic field bends it  
18 into a circle, and you have then the magnetic  
19 induction, which then continues to accelerate.  
20 So it keeps going around in a circle; the  
21 field gets stronger and stronger to exactly  
22 keep it in the center and at the same time

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1 continue accelerating.

2           Once the beam, once the power is  
3 cut off, the magnetic field is gone, if  
4 anything it's decreasing, so it can't  
5 accelerate the electrons any more. But that  
6 70 kV potential remains due to the  
7 capacitance. That there can be, I mean this  
8 is a hypothesis, that there can still be --  
9 you still have your glowing filament. Again,  
10 that does not cool off instantly.

11           So it continues and the analogy or  
12 even the parallel situation is all black and  
13 white TVs, when you turn it off, you had a  
14 glowing spot in the center that persisted for  
15 a little while. That was due to electrons  
16 continuing to be accelerated by the  
17 capacitance.

18           So if that explanation is correct,  
19 then that explains why Jack Schuetz, who  
20 reported the measurement, and I interviewed  
21 him on the telephone, and he said there was a  
22 15 mR per hour -- and it persisted, but he

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1 didn't say how long it persisted. He simply  
2 said in 15 minutes it was gone. So he didn't,  
3 you know, I don't have a time curve on it.

4 But I asked him, well, what about  
5 the shape? I assumed that it was a  
6 radioactive, short-lived radioactive source,  
7 in which case the radiation would be  
8 isotropic. He said no, it followed the same  
9 contour as the original beam.

10 So I said well, did you have the  
11 collimators in place, which of course wouldn't  
12 give you a narrow beam. He said no, the door  
13 -- when he made that measurement, the doors,  
14 as he called them, were open. Well, this  
15 would confirm it.

16 This was still not, you know,  
17 basically an X-ray beam, not a radioactive  
18 source, and furthermore, in terms of the  
19 energy -- it's a 70 kV, not keV, but a 70 kV  
20 source, which would put most of the electron  
21 energies in the tens of -- I mean most of the  
22 photon energies in the tens of keV, and the

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1 observation I made by simply inspecting a  
2 relevant table in ICRP 74, is that when you  
3 get down to 50 keV, the attenuation is such  
4 that it's only one percent. In other words,  
5 that there would be ratio between the PA and  
6 the AP exposure is .01. No, point -- yes,  
7 .01.

8 So it would explain why the film  
9 badge readings were low and there could still  
10 be exposure from the source. Now I don't mean  
11 that it's happened, but it just indicates the  
12 possibility.

13 DR. NETON: Well, the attenuation  
14 of 10 keV your photons is pretty severe in the  
15 body.

16 DR. ANIGSTEIN: I said 50. I said  
17 50 and below.

18 DR. NETON: I thought you said 10  
19 to 20.

20 DR. ANIGSTEIN: No, no.

21 DR. NETON: At 70 keV potential,  
22 it's going to be less than -- well, a third of

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1 that probably.

2 DR. ANIGSTEIN: Well, the  
3 majority, but there's -- you still, you know,  
4 you get a curve.

5 DR. NETON: My point is when you  
6 get down to 20 keV, the half value thickness  
7 in the body, the attenuation is about five  
8 millimeters.

9 DR. ANIGSTEIN: I know.

10 DR. NETON: But you're not going  
11 to get much internal organ. The worst case  
12 would be skin dose calculations.

13 DR. ANIGSTEIN: Yes, you would get  
14 a skin dose.

15 (Simultaneous speakers.)

16 DR. ANIGSTEIN: 30, 40, 50 kV,  
17 keV, you would get some dose because a typical  
18 metal -- I mean 70 kVp is a medical X-ray  
19 machine. You certainly get dose from that.

20 DR. NETON: Yes, it's more 120.

21 DR. ANIGSTEIN: Well, I remember  
22 there being --

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1                   MEMBER POSTON:       Mammography is  
2       down in 20 to 30 range.

3                   DR. ANIGSTEIN:    Pardon?

4                   MEMBER POSTON:       Mammography is  
5       down in the 20 to 30 range, and I don't know  
6       that there's many machines that run at 70.

7                   DR. ANIGSTEIN:    Today?    I think  
8       there were at one time.

9                   CHAIRMAN ZIEMER:   Well, look.   In  
10      an X-ray machine, you still have to take that  
11      beam out a window.

12                  DR. ANIGSTEIN:    Sure.

13                  CHAIRMAN ZIEMER:    You're talking  
14      about beams coming out that are hitting the  
15      sides of the generating device, I assume.

16                  DR. ANIGSTEIN:    No, no.    I'm  
17      talking about a beam that follows the same --

18                  CHAIRMAN ZIEMER:    It's only on the  
19      straightaway.

20                  DR. ANIGSTEIN:    Yes.    It passes --  
21      the only thing it passes through is the --  
22      yes.    There will be the cone there.    It will

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1 pass through the ceramic, you know, the  
2 fraction, I forget how many millimeters is the  
3 thickness of the ceramic. But the point is,  
4 the beam was measured. I mean, he made the  
5 measurement of 15 mR per hour.

6 CHAIRMAN ZIEMER: At?

7 DR. ANIGSTEIN: Six feet.

8 CHAIRMAN ZIEMER: At six feet.

9 DR. ANIGSTEIN: Right. That's the  
10 measurement he made. He ran out about five  
11 seconds -- he was deliberately doing it. He  
12 did the experiment for his own protection. He  
13 wanted to --

14 CHAIRMAN ZIEMER: Well see, I'm  
15 thinking it's a highly-filtered beam that's  
16 coming out of the sides, which means it's  
17 closer to 70 than it is to a regular X-ray  
18 beam. You're down about a third of the peak  
19 value.

20 DR. ANIGSTEIN: Yes, sure.

21 CHAIRMAN ZIEMER: But on leakage  
22 radiation, which is out the side of the tube,

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1 which this would be like you're very close,  
2 the soft stuff all gets filtered out. This  
3 should be more like a -- beam, which if you  
4 took a 70 kilovolt beam straight through,  
5 you're not going to have that 100 to 1. In  
6 fact, the front end detection would be much  
7 closer to the back. I don't think you're  
8 going to get a 100 to 1 difference.

9 DR. ANIGSTEIN: Yes. No the 100  
10 to 1 is for 50 keV.

11 CHAIRMAN ZIEMER: The 50 keV  
12 spectrum. I'm saying --

13 DR. ANIGSTEIN: No, no. 50 keV  
14 monochromatic. This is the ICRP or the --

15 CHAIRMAN ZIEMER: Monochromatic?

16 DR. ANIGSTEIN: In ICRP 74, 50 keV  
17 monochromatic gives you .01 for 180 degrees.

18 CHAIRMAN ZIEMER: Okay. What does  
19 it give you for 70?

20 DR. ANIGSTEIN: I don't have the  
21 table in front of me.

22 CHAIRMAN ZIEMER: All I'm saying

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1 is --

2 DR. ANIGSTEIN: Not much more in  
3 percent.

4 CHAIRMAN ZIEMER: Well, I don't  
5 know.

6 DR. ANIGSTEIN: Below 50 is  
7 essentially zero because it's rounded off to  
8 two decimal places. All I'm saying is it  
9 would explain why there could still be some  
10 significant exposure that did not show up on  
11 the film badge because there's no question  
12 that the betatron workers did go out there.

13 Maybe they didn't exactly break  
14 their ankle running, but I mean they certainly  
15 went out there at a fast clip because they  
16 were under pressure to get it going and start  
17 the next run. So it's simply --

18 CHAIRMAN ZIEMER: Well, what do we  
19 need to do with this?

20 DR. NETON: Well, so we -- our  
21 model doses are very high compared to what --

22 DR. ANIGSTEIN: That's okay. Not

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1 to use the -- I was -- you can't use the film  
2 badge doses to model the whole body dose  
3 exposure of this particular configuration.

4 DR. NETON: Well, they could  
5 certainly model it, use the model component --  
6 as the dose, and then you have this residual  
7 15 mR per hour issue to deal with. I guess we  
8 will take that under consideration when we  
9 model the film badges, when we use the film  
10 badge data to model exposures.

11 MR. RAMSPOTT: Dr. Ziemer?

12 CHAIRMAN ZIEMER: Yes.

13 MR. RAMSPOTT: This is John  
14 Ramspott again.

15 CHAIRMAN ZIEMER: Yes, John.

16 MR. RAMSPOTT: Dr. Anigstein makes  
17 a really actually it's a pretty incredible  
18 acknowledgment of a fact I don't think any of  
19 us have heard. But I think the crux of this  
20 conversation originally was headed towards the  
21 geometry, and I hope that doesn't get lost  
22 because this betatron is to the workers' back.

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1       The activated casting or the uranium is to  
2       his front. The difference between this and a  
3       lot of other geometry issues is there are two  
4       sources of radiation at the same time.

5                   CHAIRMAN ZIEMER: Right.

6                   MR. RAMSPOTT: And that really, I  
7       would think that would cause a problem for  
8       film badge reading. The badge is on the  
9       front, not on the back. So you really do have  
10      two sources. Not one, not somebody just  
11      spinning, you get part of the time. He's  
12      getting hit all the time by two sources.

13                  CHAIRMAN ZIEMER: Well, it sounds  
14      like the one source attenuates away pretty  
15      rapidly, unless they're only in there briefly.

16                  DR. MAURO: Well --

17                  MR. RAMSPOTT: Well, they are only  
18      in there briefly. They say the set-up time  
19      was 15 minutes, I think is what the workers  
20      said, and I think that's in Dr. Anigstein's  
21      report. I think they were at the casting in  
22      five seconds, if I read the report right.

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1           So if they're in there 15 minutes,  
2           and that beam or that betatron is only  
3           activated or that new beam that we're hearing  
4           about now is there for 15 minutes, it's there  
5           the whole time the guys are in the --

6           CHAIRMAN ZIEMER:       I would be  
7           surprised if it's more than even a minute,  
8           just like the spot on your TV.

9           DR. ANIGSTEIN:       We assumed, John,  
10          we assumed that based on Jack Schuetz's  
11          information --

12          MR. RAMSPOTT:       That's what I was  
13          listening to.

14          DR. ANIGSTEIN:       -- 15 mR, you  
15          know, at five seconds, and then it's  
16          essentially nothing at 15 minutes. So I  
17          assume the nothing is like background, which  
18          is a few microwatts -- thousandths of an mR.  
19          So it goes away with a half life of about a  
20          minute.

21                 So by 15 minutes, it's all gone.  
22          It's not a 15 minute steady exposure. This is

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1 completely modeled, we integrated under the  
2 curve. But actually, in terms of the exposure  
3 during radiography of steel, not uranium but  
4 steel, the, what I call here mistakenly, or  
5 maybe not mistakenly or at least possibly  
6 mistakenly, the exposure to the doughnut, that  
7 accounts for over half the total exposure.

8 MR. RAMSPOTT: Yes, because --

9 DR. ANIGSTEIN: Because the  
10 control room doesn't get that much, and the  
11 metal doesn't get that much.

12 MR. DUTKO: Dr. Ziemer?

13 CHAIRMAN ZIEMER: Yes.

14 MR. DUTKO: One comment please?

15 CHAIRMAN ZIEMER: Yes. John  
16 Dutco, I believe. Dutko rather.

17 MR. DUTKO: When we showed up a  
18 six foot shot with either betatron, I'd like  
19 to point out that the six foot was from the  
20 cone to the film, minus the thickness of the  
21 casting. Now if you had a casting that was 16  
22 inches thick, look how close that cone was to

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1 us.

2 CHAIRMAN ZIEMER: Okay, thank you.

3 MEMBER MUNN: And one cannot make  
4 the assumption that the reduction in radiation  
5 is linear from that five second to 15 --

6 DR. ANIGSTEIN: No, I said it was  
7 exponential. That's what I assumed, yes.

8 DR. MAURO: The reason I find this  
9 is important is for the longest time, when we  
10 were running -- both of us were running our  
11 MCMP, we're saying, but we're not getting this  
12 15 millirem per hour number. Where's that  
13 coming from? So we believed it, because  
14 someone went out there and measured it. You  
15 couldn't ignore them.

16 But it sure wasn't coming out of  
17 our runs. But now, this at least what this  
18 does is it says, hmm, I think we've got an  
19 answer to why, you know, this was experienced.

20 Now I see -- and then now the  
21 issue, now so that's step one. That's very  
22 satisfying, that we think we have a reason why

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1 that was observed. The other part has to do  
2 with this geometry issue.

3 Now you know, I know that NIOSH is  
4 depending heavily on the post-64 film badge  
5 record as being confirmatory, that gee, look  
6 at the records we do have; the numbers are  
7 really low, nowhere near the six rem that you  
8 were ready to assign to these folks that were  
9 doing the work.

10 The only point being made here is  
11 that yes, what was observed was low, but that  
12 doesn't -- but it could very well, as many of  
13 them at zero. But that's the point being  
14 made. It's very possible that the 15 millirem  
15 per hour dose rate really never made it to the  
16 film badge, you know. It might have been  
17 attenuated by a body.

18 So what I'm getting at is that I  
19 consider all these to be tractable issues. In  
20 other words, these are issues where the  
21 physicists could sit down and come to some  
22 consensus on what's a reasonable set of

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1 assumptions to model distances, attenuation,  
2 energy distributions, et cetera, et cetera.

3           These in my opinion, in my opinion  
4 are not SEC issues. These are tractable. And  
5 so I mean I think it's so important that we  
6 could spend a lot of concern over what I  
7 consider Site Profile issues. It's the film,  
8 lack of film badge data in those ten years  
9 that really is the place that gets my  
10 attention.

11           Everything else we can talk about,  
12 and we'll work that out.

13           CHAIRMAN ZIEMER: But this is not  
14 in your SEC findings. Let me point out, just  
15 a quick calculation. So a 15 mR per hour  
16 beam, if it lasted a minute, you've got a  
17 quarter of an mRper run.

18           DR. ANIGSTEIN: Well, the actual  
19 calculation integrating under the curve is  
20 that I got -- okay. If there were entirely  
21 short exposures, which are five. I think  
22 they're defined as five-minute exposures, they

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1 got 34-1/2 mR per shift, going in and out.

2 CHAIRMAN ZIEMER: From this?

3 DR. ANIGSTEIN: Just from that  
4 component.

5 CHAIRMAN ZIEMER: You're assuming  
6 exponential --

7 DR. ANIGSTEIN: Yes, I'm assuming  
8 exponential.

9 CHAIRMAN ZIEMER: But you have no  
10 evidence for that.

11 DR. MAURO: We don't know that  
12 yet.

13 DR. ANIGSTEIN: Oh, I'm just  
14 saying --

15 CHAIRMAN ZIEMER: You don't know  
16 whether it's 15 minutes or one minute. He's  
17 got one point here, one point there.

18 DR. ANIGSTEIN: That's correct,  
19 and I'm thinking the claimant-favorable  
20 assumption --

21 CHAIRMAN ZIEMER: Is that a  
22 reasonable --

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1 DR. ANIGSTEIN: That it was  
2 background, that after 15 minutes it was down  
3 to background.

4 CHAIRMAN ZIEMER: Well, you know,  
5 when you turn off, you made the analogy with  
6 the TV set. When you turn it off, that spot's  
7 not there 15 minutes. It's not there one  
8 minute. You see it for a few seconds. I mean  
9 --

10 (Simultaneous speakers.)

11 DR. MAURO: It may turn out that  
12 those are overestimates. We'll debate on that  
13 --

14 CHAIRMAN ZIEMER: All right.

15 DR. ANIGSTEIN: But I mean, we  
16 don't know what the -- is. As a matter of  
17 fact --

18 CHAIRMAN ZIEMER: Well even that's  
19 a tractable issue.

20 DR. MAURO: Yes, it is tractable.

21 DR. ANIGSTEIN: If you can find  
22 the --

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1                   CHAIRMAN ZIEMER:    If we can find  
2    how fast those things bled off, that would  
3    tell you right there.

4                   (Simultaneous speakers.)

5                   DR. ANIGSTEIN:    Yes, okay.

6                   CHAIRMAN ZIEMER:    Well, in any  
7    event, I guess I need to know where we're  
8    going to go with this.

9                   DR. NETON:    Well, we've seen this  
10   analysis that was done on the hypothesis of  
11   the source of this 15 mRper hour field?

12                  DR. ANIGSTEIN:   No, this just came  
13   up.

14                  DR. NETON:    I think we'd like to -  
15   - I assume you're going to put together a  
16   document on this --

17                  DR. ANIGSTEIN:   Well, we really  
18   can't until we've done, unless we've actually  
19   studied the wiring diagram, to see --

20                  CHAIRMAN ZIEMER:    I guess we're  
21   going to take the worse case, and say okay, we  
22   have a 15-minute point that we have the

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1 initial, all right. If you want to assume  
2 exponential, what's worse case?

3 DR. NETON: Well, but by my  
4 calculation that comes out to like 6 rem per  
5 year or something, which I think is probably  
6 pretty high. It was 33 millirem per shift.

7 DR. ANIGSTEIN: But that's just  
8 for the short run. It's a mixture of the --

9 (Simultaneous speakers.)

10 DR. ANIGSTEIN: Well, it probably  
11 will be about, eyeballing, it may be about 25  
12 per shift, 25 millirem per shift.

13 DR. NETON: Well, you can  
14 extrapolate upwards of a five-rem-per-year  
15 exposure.

16 DR. ANIGSTEIN: Yes. Well, we got  
17 -- we ended up with 13.6 rems per year, and  
18 this was a major component of that dose.

19 DR. NETON: Well, we're almost  
20 back to square one. If we came up with six  
21 and you took that component out, because  
22 you've got the film badge data to demonstrate

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1 --

2 DR. ANIGSTEIN: But your six is  
3 based almost entirely on exposure to the  
4 uranium, where there was an error of 20 in  
5 calculating the dose rates from the uranium.  
6 So if you took that out, you're down to about  
7 one or two.

8 DR. NETON: Well my point is, if  
9 you have film badge data that shows it's zero,  
10 the component from the betatron itself that  
11 we've modeled -- well, you have real data  
12 showing that the betatron dose is very low.  
13 Then you're left with this residual component  
14 that needs to be modeled somehow, and you've  
15 taken a shot at it. We'd like to see your  
16 analysis of the source of that.

17 DR. ANIGSTEIN: The analysis is  
18 right in here.

19 DR. NETON: No, no, no. I  
20 understand the arithmetic. I'm talking about  
21 the mechanism.

22 DR. ANIGSTEIN: The mechanism is

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1 just a hypothesis.

2 DR. NETON: Right.

3 (Simultaneous speakers.)

4 DR. MAURO: Remember though, this  
5 is a measurement someone made, and we're  
6 taking that -- correct. All that really  
7 happened here is ahh, this might be the reason  
8 for that.

9 DR. NETON: But I mean we've heard  
10 it verbally here, not in writing and you know,  
11 string it together so we can look at it and  
12 think about it.

13 DR. ANIGSTEIN: I can write a memo  
14 on it, but it won't be an analysis, because  
15 there's no more analysis than I've already  
16 done.

17 MEMBER MUNN: Well yes, but for  
18 all of our sakes, if we don't have the  
19 information that you have in written form  
20 somewhere, then we're never going to think  
21 about --

22 (Simultaneous speakers.)

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1                   CHAIRMAN ZIEMER:     Well, but at  
2     least it's a final number.

3                   DR. ANIGSTEIN:     But those are in  
4     here.    The number won't change.    We've just  
5     postulated a new explanation for this.   This  
6     was -- the calculation we did was purely  
7     phenomenological.   This is what was reported.

8     This is what was measured, and we just took  
9     it and did a time integration and a distance  
10    integration, because this was at six feet, but  
11    the worker is not necessarily at six feet  
12    because the casting is at six feet.   But the  
13    worker moves back and forth between that.

14                  CHAIRMAN ZIEMER:     And this is  
15    depicted as a skin dose or a deep dose?

16                  DR. ANIGSTEIN:     No, a deep dose.  
17    The 15 mR per hour was measured with a  
18    Victoreen chamber, heavily with a big plastic  
19    shield around it to get equilibrium, and it  
20    was meant for that -- that Victoreen chamber  
21    was used to measure the 25 MeV, the exposure  
22    rate from the 25 MeV for a beta run.   They

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1 didn't set up a special one for this.

2           So I believe he used the same one,  
3 the Victoreen chamber, and then they had added  
4 a very big plexiglass shield to it, to get --  
5 so you can get electronic equilibrium, because  
6 you wouldn't get it otherwise. So they  
7 measured it at six feet, and we said the  
8 worker may be going back and forth.

9           But for the short shots, where  
10 they measure the heavy casting, the casting  
11 itself is at six feet so the worker can't be  
12 at six feet. So I'd say the worker is maybe  
13 at three feet, or the casting for the lighter,  
14 thinner casting, for the casting it at nine  
15 feet, we said well, the guy goes back and  
16 forth between three and six feet.

17           CHAIRMAN ZIEMER:       This is a  
18 Victoreen R-meter here?

19           DR. ANIGSTEIN: Pardon?

20           CHAIRMAN ZIEMER:       Was it a  
21 Victoreen R-meter here that was used? Or what  
22 was used?

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1 DR. ANIGSTEIN: Yes. No, a  
2 Victoreen ionization chamber.

3 CHAIRMAN ZIEMER: Oh, okay.  
4 That's what they call it in -- the R-meter.

5 They're using a fixed equilibrium.

6 I mean you don't use the same equilibrium  
7 chamber for kilovolts as you would for cobalt.

8 DR. ANIGSTEIN: That is entirely  
9 correct, and I'm just assuming that this  
10 person used the same set-up that they normally  
11 use to calibrate the beam and to calibrate the  
12 tubes. And the -- it was just a simple  
13 experiment he did to convince him, because he  
14 was told, you have to -- you can't go out  
15 there. You have to wait so many minutes  
16 before you're allowed to go in there, and he  
17 said, I don't want to waste the time. I want  
18 to get out there sooner.

19 So he went in and took this  
20 measurement, purely for his own protection,  
21 and he convinced himself that that's low  
22 enough, he's not going to worry about it.

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1 MR. RAMSPOTT: Dr. Ziemer?

2 CHAIRMAN ZIEMER: Yes.

3 MR. RAMSPOTT: This is John  
4 Ramspott. Dr. Anigstein, the gentleman you're  
5 talking about, Jack Schuetz, he was the  
6 technical manager for Allis-Chalmers' Company,  
7 was he not?

8 DR. ANIGSTEIN: I believe he was  
9 the service -- he was simply the service  
10 manager.

11 MR. RAMSPOTT: Yes, John was that.  
12 He definitely was not just the ordinary Joe.  
13 He was the man, and I think NIOSH contracted  
14 him for some information.

15 DR. ANIGSTEIN: That is correct.

16 MR. RAMSPOTT: Okay.

17 DR. ANIGSTEIN: He's the only  
18 person they had that was left.

19 MR. RAMSPOTT: Okay. He was  
20 definitely an expert.

21 DR. ANIGSTEIN: Yes. Well, okay.

22 MEMBER POSTON: But I would like

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1 to see something in writing, because we've had  
2 a lot of hand-waving and back and forth, and I  
3 think in order to understand this, we're going  
4 to have to look at it --

5 (Simultaneous speakers.)

6 DR. MAURO: It's part of the  
7 record.

8 DR. ANIGSTEIN: It's in our review  
9 of Appendix BB.

10 DR. MAURO: There's an explanation  
11 on now we think we have a reason why.

12 DR. ANIGSTEIN: Well now we have  
13 an explanation, I can --

14 DR. MAURO: Sure.

15 CHAIRMAN ZIEMER: If you wouldn't  
16 mind taking a look at the 15 number.

17 I'm just wondering and, Jim, you  
18 can give me your opinion on this, but if it  
19 really was like a 70 kilovolt spectrum with a  
20 heavy equilibrium chamber, I'm wondering how  
21 that would perturb the beam. It seems to me  
22 they may be underestimating that number.

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1 DR. NETON: That's a very good  
2 point.

3 CHAIRMAN ZIEMER: You could look  
4 at that. I think you could probably look --

5 DR. ANIGSTEIN: And we could model  
6 that. We could model that.

7 CHAIRMAN ZIEMER: -- to find out  
8 how far you're off if you use the wrong  
9 equilibrium chamber. Because if he's using  
10 what one used for the beam --

11 DR. ANIGSTEIN: Yes.

12 CHAIRMAN ZIEMER: You're talking  
13 about a very normal situation.

14 MEMBER POSTON: Yes, yes. Well,  
15 there are tables that tell you which to use  
16 with which detector, which equilibrium field  
17 to use.

18 DR. NETON: I also think it would  
19 be good to have a discussion, because the  
20 energy spectrum is sort of critical here, and  
21 your mechanism that you've come up with sort  
22 of postulates why this is a very low-energy

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1 spectrum. So I think we need to think about  
2 that.

3 (Simultaneous speakers.)

4 CHAIRMAN ZIEMER: If this is  
5 scattered off the sides of the chamber and not  
6 coming out a window --

7 DR. ANIGSTEIN: No, it wouldn't be  
8 scattered off the sides, because it's --

9 CHAIRMAN ZIEMER: Well, that's  
10 straightforward, but then you have the whole  
11 rest of the thing. It must be --

12 DR. ANIGSTEIN: No, no. I mean  
13 you will have your -- you have your source.  
14 You have your filament and you have your  
15 anode, and they're in the direction, I  
16 believe, from what I recall, they're in -- I  
17 don't have my entire notebook here, but --

18 CHAIRMAN ZIEMER: But when the  
19 thing's operating, your magnetic field --

20 DR. ANIGSTEIN: But that's a  
21 normal operation.

22 CHAIRMAN ZIEMER: --keeping the

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1 beam from hitting the sides. So when that  
2 comes off --

3 DR. ANIGSTEIN: Not entirely. If  
4 the beam never hit the side, it would never  
5 get out. So you have a deflecting voltage.

6 CHAIRMAN ZIEMER: Well, at some  
7 point.

8 DR. ANIGSTEIN: Yes, at this  
9 point, that allows that --

10 CHAIRMAN ZIEMER: But I think at  
11 this point --

12 DR. ANIGSTEIN: No, I'm sorry.  
13 I'm sorry. Forgive me, that was stupid. The  
14 electron beam keeps going in a circle. It  
15 hits the platinum target and you have a very  
16 strong forward -- x-ray have a very -- that  
17 energy has a very, very strong forward peak.

18 CHAIRMAN ZIEMER: But what's the  
19 70 kilovolt?

20 DR. ANIGSTEIN: The 70 kilovolts  
21 is the initial accelerating voltage.

22 CHAIRMAN ZIEMER: Right.

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1 DR. ANIGSTEIN: Which is linear.

2 CHAIRMAN ZIEMER: But the magnetic  
3 field's been turned off, right?

4 DR. ANIGSTEIN: The other field's  
5 been turned off at this point.

6 CHAIRMAN ZIEMER: Then you can't  
7 have anything going in the --

8 DR. ANIGSTEIN: We don't have  
9 anything going around. I'm just saying --

10 CHAIRMAN ZIEMER: Well then it  
11 can't go out the exit.

12 DR. ANIGSTEIN: Yes, it can, the  
13 x-ray beam, not the electron. The x-ray beam  
14 is still hitting, can still be hitting the  
15 platinum target. I mean the electron beam is  
16 accelerated to 70 kilovolts. It's hitting  
17 something.

18 CHAIRMAN ZIEMER: That's what I'm  
19 saying. I'm wondering if it's hitting --  
20 well, you know what I'm saying, John.

21 DR. MAURO: Yes, I do.

22 (Simultaneous speakers.)

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1                   CHAIRMAN ZIEMER:    If it's hitting  
2   the side and coming out, it will produce  
3   bremsstrahlung.

4                   (Simultaneous speakers.)

5                   CHAIRMAN ZIEMER:    -- which would  
6   look more like leakage radiation in a regular  
7   x-ray, which is a very hard beam, very highly  
8   filtered.

9                   DR. ANIGSTEIN:    Except that Jack  
10   Schuetz again, because I questioned him on  
11   that. He said it has the same profile as the  
12   initial, as the full beam.

13                  CHAIRMAN ZIEMER:    Okay.

14                  (Simultaneous speakers.)

15                  CHAIRMAN ZIEMER:    Okay.    SC&A is  
16   going to provide an analysis. Thank you. Dr.  
17   Poston has to leave, I think. I'm not  
18   encouraging you to, but I know you have to  
19   catch a plane. But --

20                  MEMBER    POSTON:            You    would  
21   encourage me to have a nice Christmas,  
22   wouldn't you?

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1 DR. MAURO: Absolutely.

2 MEMBER POSTON: Everybody have a  
3 happy holidays.

4 CHAIRMAN ZIEMER: Happy holidays.  
5 Issue 5, lack of validation of models. The  
6 initial finding says that neither the film  
7 badge data nor the modeled exposures can be  
8 used to establish an upper bound of the  
9 external exposures that is claimant-favorable.

10 DR. ANIGSTEIN: And scientifically  
11 correct.

12 CHAIRMAN ZIEMER: But this refers  
13 again to the incidents. The incidents in  
14 themselves call into question the exposure  
15 condition. But my sort of reaction at this  
16 point is similar to before. Part of that  
17 grows out of the uncertainty in the early  
18 period when there was no monitoring, I think.

19 DR. ANIGSTEIN: No.

20 CHAIRMAN ZIEMER: No?

21 DR. ANIGSTEIN: No. This simply  
22 says that the -- it argues in the opposite

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1 direction in a way that's saying that there  
2 seems to be no correlation between the film  
3 badge data and the models. I mean that's  
4 basically -- lack of validation. Validation  
5 means you have -- you perform a field test and  
6 see whether your model is correct.

7 And the field test, if you want to  
8 call the film badge data, the film as a field  
9 test does not validate the model. Then on the  
10 other hand, the model does not account for  
11 this exposure of 24, 70 millirem during the  
12 covered period. Nor does 75, 90 millirems in  
13 one week after the covered period, and now  
14 that we've seen the --

15 CHAIRMAN ZIEMER: Well, let me ask  
16 this question. Let's suppose you have a model  
17 for this facility, and you have a worker who's  
18 film badge showed a number that's higher than  
19 the model. What happens in dose  
20 reconstruction?

21 MR. ALLEN: We can, just as we  
22 said we did with Issue 1, we mentioned about

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1 the individual case.

2 CHAIRMAN ZIEMER: About that  
3 individual case. So in that case, you would  
4 assign the higher dose.

5 DR. ANIGSTEIN: Yes, to that one  
6 individual. But I guess the philosophical  
7 point that I'm raising, and may not even be  
8 appropriate in this context, I'm not sure, is  
9 if we had a -- if the model was realistic. If  
10 we had a realistic model, you wouldn't expect  
11 exactly a one-to-one correspondence.

12 But you would expect some  
13 similarity between the model exposures and the  
14 measured exposures, and there really isn't  
15 any. I have to say personally I was surprised  
16 when I saw --

17 CHAIRMAN ZIEMER: Well first of  
18 all, you would agree these two are outliers  
19 from the rest of the film badge data.

20 DR. ANIGSTEIN: Yes, they are.  
21 They are outliers.

22 CHAIRMAN ZIEMER: So --

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1 DR. MAURO: Everything else is  
2 zero. I mean there's all these zeroes, and  
3 then an occasional big one. And it --

4 (Simultaneous speakers.)

5 DR. ANIGSTEIN: And very few low  
6 in the tenth, you know, in the tens. So you  
7 get maybe a 300, and a few low ones. Most,  
8 the vast majority is M: minimal.

9 CHAIRMAN ZIEMER: Well first of  
10 all, I sort of feel like I'm defending the  
11 NIOSH thing, but I'm doing devil advocacy  
12 thing here.

13 DR. MAURO: So forget the  
14 outliers, because you only put them aside.

15 CHAIRMAN ZIEMER: Put them aside.  
16 If you have all these zeroes in the first  
17 place, even if we didn't use a model, we  
18 wouldn't accept that anyway. But you've got -  
19 -

20 DR. MAURO: Missing dose.

21 CHAIRMAN ZIEMER: So the model,  
22 though, if your model says, well we know that

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1 we weren't measuring these anyway, certain  
2 things with the film badges, whatever it might  
3 be, then you would expect that our model  
4 should be somewhere higher than whatever you  
5 would assign as a difference. The film badge  
6 data plus the missed dose, you know, all that.

7 COURT REPORTER: Gentlemen, can  
8 you come closer to the table?

9 CHAIRMAN ZIEMER: So I'm not sure  
10 you want one to one correspondence. These  
11 models generally are much more liberal. I  
12 would argue to people that the less we know  
13 about you, the better off you are, because  
14 we're going to really overestimate.

15 If we know your film badge is  
16 really correct, if somebody -- if you made the  
17 argument that we know that these film badges  
18 in this case, the energy is correct and the  
19 angularity is correct and there's no question  
20 of usage and so on, then that's the number.

21 DR. MAURO: And the regulations  
22 require that.

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1                   CHAIRMAN ZIEMER: Yes. So one to  
2 one -- that doesn't surprise me so much, and  
3 to say that they don't cover a couple of  
4 outliers where we know that there's something  
5 off-normal about those, that doesn't bother me  
6 so much either.

7                   So I'm trying to get a feel for  
8 where we say, you know, how close should the  
9 model be to reality. Most of these models, I  
10 think, really overestimate things  
11 considerably.

12                  DR. ANIGSTEIN: One big issue we  
13 have with the film badges, and it was brought  
14 up at a Work Group meeting oh, maybe a year  
15 and a half ago, and that is the proposed use  
16 of the film badge.

17                  I don't know if NIOSH really  
18 proposes to use it that way, is to derive a  
19 log-normal distribution and use the, you know,  
20 and talk about the mean and the 95th  
21 percentile, because that is mentioned in the  
22 White Paper and is also mentioned in the SEC

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1 Evaluation Report.

2 We did a statistical analysis of  
3 this, and showed that it simply is not valid.

4 I mean it's something, I don't know if I  
5 should -- can people just see if I hold this  
6 up, as a -- you don't have to read.

7 Obviously, you have to read it,  
8 but to see the shape of the curve. A log-  
9 normal would follow this line, and it's just -  
10 -

11 MEMBER MUNN: Not much of a curve.

12 DR. ANIGSTEIN: Right. It's  
13 simply not a log-normal curve. This is only  
14 in the restricted version. It's not in the PA  
15 version because it gives away too much  
16 personal dose information.

17 So the -- it's not that the film  
18 badge data is irrelevant, but there was a  
19 proposed use of it, decide to create a  
20 distribution with a mean and a standard  
21 deviation.

22 That is only valid, such an

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1 analysis can only be done for normal or log-  
2 normal data. I don't know. It's never a  
3 perfectly normal or perfectly log-normal, but  
4 at least -- this is, you know, we had our  
5 statistician. Dr. Chmelynski, you know, study  
6 this.

7 It simply did not pass the test.  
8 So it's not saying it's irrelevant, but the  
9 way the proposed use of it is something we  
10 can't agree with.

11 MR. ALLEN: Well, I would agree.  
12 I mean that graph basically shows that these  
13 are outliers, which is usually what he's  
14 saying here. They don't follow that curve.

15 I thought about it when I was  
16 putting that together, of separating this into  
17 essentially incident versus off-normal versus  
18 typical, and if you do that, you can get a  
19 frequency for how often somebody -- you get  
20 these off-normal type of events, and you can  
21 apply that frequency to everybody.

22 I mean it's only a handful --

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1 well, this is to the minor occurrence.  
2 There's only like a handful of, you know, it  
3 depends where you make the cutoffs. Say a 100  
4 millirem on a badge read. There's about seven  
5 readings, about 100 millirem through 64 to 73.

6 But -- and they are relatively  
7 evenly spaced through the years, indicating  
8 it's not, you know, you get these kind of  
9 exposures, say once a year essentially.

10 MEMBER MUNN: When they're doing  
11 something.

12 MR. ALLEN: When they're doing  
13 something, and I mean taking that kind of a  
14 frequency and the average dose, and applying  
15 that, then removing those outliers essentially  
16 from the rest of it, you can get a better  
17 distribution. The answer ends up being pretty  
18 close to the same thing.

19 DR. ANIGSTEIN: I don't think you  
20 have any distributions, because you have  
21 something like, what was the total number?  
22 During the covered period, you have, I forget

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1       how many thousands badge readings there were,  
2       something like 5,000.       During the covered  
3       period.

4                       MR. ALLEN:   Almost 7,000.

5                       DR. ANIGSTEIN:   In the thousands.

6       Okay.   There are only 23 readings where there  
7       are numbers.   There are only 20 -- of all of  
8       those two and a half years of data, covering  
9       anything from 18 to a peak of maybe 70  
10      workers, there are 23 numbers.   Everything  
11      else is an M.   You can create any kind of a  
12      number you want around that M for that 23  
13      number.

14                      I don't, you know, leave it to  
15      question, and those 23 numbers do not follow  
16      the normal distribution.   So the question is  
17      how can you construct a distribution when you  
18      only have 23 numerical values?   That includes  
19      this outlier of 24, 70.   It includes values of  
20      about 380, 40, 20.

21                      Oh, and of those 23, ten of them  
22      are ten, and ten is the threshold.

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1 MR. ALLEN: That is not contended.

2 DR. ANIGSTEIN: Well, but there  
3 was some --

4 (Simultaneous speakers.)

5 DR. ANIGSTEIN: Okay. And then so  
6 to take out those, you're left with ten  
7 readings. Now how can you construct -- out of  
8 ten readings, how can you construct the model  
9 and the distribution?

10 MEMBER MUNN: Now that poses an  
11 interesting philosophical and mathematic  
12 question, but in terms of reality and common  
13 sense, that would lead you to believe that you  
14 are simply dealing with an operation which had  
15 very low exposure, and in which the  
16 individuals who were exposed were extremely  
17 safe --

18 (Simultaneous speakers.)

19 DR. MAURO: And every once in a  
20 while, something happens where someone got a  
21 dose. Very rare, but it happens. What do you  
22 do with that for that ten-year period?

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1                   MEMBER   MUNN:           And they were  
2                   badged, so that you knew when those pop up.

3                   DR. MAURO:    Right, right.    So to  
4                   me, you've got -- you see, to me, I go  
5                   backward again.   You have ten years, nobody's  
6                   wearing a badge, and you know what?  Probably  
7                   if your plan is to assign six rems per year --  
8                   , or maybe 13, whatever the number is to  
9                   everybody, there's no doubt that is going to  
10                  overestimate the dose to everybody.

11                  MEMBER    MUNN:           Overestimate  
12                  everybody.

13                  DR. MAURO:    Right, right.    But the  
14                  idea is there's no mechanistic relationship.  
15                  There's no reasonable -- in other words,  
16                  there's no reason why six makes, applies  
17                  there.  I mean you could --

18                  DR. ANIGSTEIN:    You said last  
19                  meeting, pick 100.

20                  DR. MAURO:    Really, you could pick  
21                  100.  Want to pick 100 --

22                  DR. NETON:    Let me ask a question.

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1 Of all these diagrams, is it possible to  
2 segregate betatron operators from general  
3 radiography operators or not?

4 DR. ANIGSTEIN: No, no. The  
5 policy was the reason they put in the badge  
6 program in the first place was to satisfy the  
7 AEC. The AEC was not concerned with the  
8 betatron, right. So they put it in. But as  
9 long as they were doing it, they gave it to  
10 the betatron operators, at least in '64. What  
11 they did before then, we don't know.

12 DR. NETON: That's my question.  
13 So you have a lot of doses are almost all non-  
14 detects except for 20-something?

15 DR. ANIGSTEIN: Yes.

16 DR. NETON: Do we know where these  
17 20-something -- have you done a correlation  
18 with betatron operators? Do you know where,  
19 who are betatron operators to some extent,  
20 based on our --

21 DR. ANIGSTEIN: I think we know --

22 MR. ALLEN: Some people were

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1       betatron operators.  Some people were isotope  
2       operators.  Many of them, we don't know.  I  
3       mean what we know came primarily from the --

4                   DR. NETON:  Right.  But I guess my  
5       question is, is there a cross-correlation we  
6       can do to show that the zeroes or the non-  
7       detects mostly came from betatron operation,  
8       and the high values were more likely related  
9       to radiography.

10                  MR. ALLEN:  Not unless we could --  
11       not unless the workers could identify these  
12       people, which is always a problem with the PII  
13       stuff.

14                  DR. ANIGSTEIN:  What about the  
15       records, these NRC records, because they  
16       apparently mentioned names.

17                  DR. NETON:  That's my question.  
18       If somehow one can segregate this and  
19       demonstrate that indeed, the betatron  
20       operators, at least the badges, that what was  
21       measured on their badges was very low.

22                  DR. ANIGSTEIN:  Well, we know that

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1 two -- again, there was a dispute about -- you  
2 know, some people say that's not what really  
3 happened. But the two cases where there were  
4 over-exposures and the doses were subtracted,  
5 and there was documentation furnished by the  
6 workers, one by a worker, one by the worker's  
7 colleague, those exposures involved the  
8 betatron.

9 Now there was question whether  
10 maybe, you know, there is secondhand  
11 information saying no, it really wasn't the  
12 betatron. But that worker is deceased, so we  
13 didn't get anything except, you know, a  
14 secondhand account.

15 But and there were many that did  
16 both, and for instance, if I maybe I'll take  
17 the liberty of quoting John Dutko, who relayed  
18 this to me. He was a betatron operator. He  
19 was also an assistant isotope operator.

20 CHAIRMAN ZIEMER: Well, in any  
21 event, we have a little dilemma here, but it  
22 may be another case where the additional

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1 information will inform this to some extent.

2 DR. ANIGSTEIN: Yes.

3 CHAIRMAN ZIEMER: I would also  
4 point out that it's highly likely that the  
5 zeroes or the minimals themselves have a  
6 distribution, but it's unknown to us.

7 DR. ANIGSTEIN: Exactly.

8 CHAIRMAN ZIEMER: Between zero and  
9 ten, there's probably a distribution.

10 DR. ANIGSTEIN: Sure.

11 CHAIRMAN ZIEMER: Now you may have  
12 that distribution, and then you have these  
13 others, which are a different distribution,  
14 and in trying to combine them, you run into  
15 the -- you can't analyze them together.

16 DR. ANIGSTEIN: Yes. My point is,  
17 again, if I'm not being --

18 CHAIRMAN ZIEMER: No, no.

19 DR. ANIGSTEIN: Is not that it's  
20 are you protecting the workers, but also the  
21 mandate is to be scientifically correct.

22 CHAIRMAN ZIEMER: Okay.

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1 MR. RAMSPOTT: Dr. Ziemer?

2 CHAIRMAN ZIEMER: Yes, sir.

3 MR. RAMSPOTT: There's another  
4 issue with this whole thing, that really needs  
5 to be brought to the forefront, that the  
6 workers did not wear their badges all the  
7 time, even they were a noted radiation badge  
8 person. As an example, managers who were  
9 badged who went in the betatron an hour a day  
10 maybe at the most, had a badge. It stayed at  
11 the office.

12 So their reading, let's say if you  
13 look at their reading for a week or for a  
14 month, and the man's only been in there one  
15 hour or four hours out of a whole month, his  
16 badge is going to look real low, but in fact  
17 he wasn't in the betatron area, yet he might  
18 have been in other areas without his badge  
19 that were hot.

20 CHAIRMAN ZIEMER: Yes, understood.

21 And this is not unlike what we face at many  
22 sites, where workers indicate that they may

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1 not have worn their badges all the time. If  
2 we are successful in the modeling attempt, we  
3 try to account for that in terms of these  
4 overestimates, which you can't always  
5 guarantee across the board that they will  
6 cover everybody.

7 But certainly if we're  
8 conservative in that regard, that the model  
9 will try to account for that. But we  
10 recognize that that often is the case.

11 MR. RAMSPOTT: That's why the  
12 modeling doesn't match the badges.

13 CHAIRMAN ZIEMER: Well, that's one  
14 reason the modeling tends to be much higher in  
15 the model.

16 MR. RAMSPOTT: And the badges just  
17 weren't worn.

18 CHAIRMAN ZIEMER: Now are we to  
19 assume a fairly large number of hours of  
20 exposure for years with these workers?

21 MR. ALLEN: Depends on which model  
22 you're talking about.

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1                   CHAIRMAN ZIEMER:     Yes, and in  
2     general that's the case.     We assume a lot  
3     more.

4                   MR. ALLEN:     A lot more hours of  
5     operation actually occurred.

6                   CHAIRMAN ZIEMER:     Again, I think  
7     this, we're going to have to keep this one  
8     open and see if it's informed further by the  
9     new data.     Let me see where we are.

10                  Issue 6, underestimate of external  
11     exposure of unmonitored workers.     Is this very  
12     much different than the other one?     It's the  
13     same issue, isn't it?

14                  DR. ANIGSTEIN:     No, no.     These are  
15     the ones -- the other one was the issue for  
16     the period.     But there was -- where we don't  
17     have data, and this is for the monitored  
18     period, but for the workers who were not given  
19     film badges.

20                  CHAIRMAN ZIEMER:     Right.

21                  DR. ANIGSTEIN:     In other words,  
22     deliberately not given film badges.     Not

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1 people who didn't wear their film badges, but  
2 we think they were never issued film badges.

3 CHAIRMAN ZIEMER: But I think in  
4 terms of the new information on source terms  
5 and so on, that could change too right, Dave?

6 DR. ANIGSTEIN: Yes.

7 MR. ALLEN: Yes, that's possible.

8 I took this one as meaning we didn't think it  
9 was a wise idea to have two separate models,  
10 two groups of people, radiographers and those  
11 that were associated with that, versus others  
12 like the secretaries, et cetera.

13 DR. ANIGSTEIN: Yes, and our point  
14 is that some of the people, the office  
15 personnel obviously would be a separate  
16 category, but they could be workers whose  
17 duties brought them in the vicinity, like  
18 again the use of the restroom, the use of the  
19 -- they brought them into contact with  
20 radiation sources, who were not monitored.

21 MR. ALLEN: And like Dr. Ziemer  
22 said with the new model, modeling some other

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1 exposures we didn't know about at that time,  
2 that will obviously change the criteria for  
3 when that model applies or what groups of  
4 people that model applies to.

5 DR. NETON: We need to look at  
6 these documents that Dr. McKeel found.  
7 They're license documents, diagrams,  
8 compliance inspection reports, surveys. I  
9 mean, those kind of things we'll get something  
10 particular about the radiography operations.

11 MEMBER BEACH: Is the time period  
12 on that 53 to 63, or does it go through to 66  
13 on number six?

14 DR. ANIGSTEIN: Well, for the  
15 people who were never issued film badges, it  
16 doesn't matter which year.

17 MEMBER BEACH: It doesn't matter.

18 CHAIRMAN ZIEMER: The basis for  
19 this, there is an unmonitored group and a  
20 monitored group.

21 MEMBER BEACH: It's the same time  
22 period, though.

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1                   CHAIRMAN ZIEMER:     That was the  
2     same, initially, at least.

3                   DR. ANIGSTEIN:    Yes.

4                   DR. MAURO:     There's a group of  
5     workers that were not wearing their film  
6     badges.    Whether they didn't wear them on  
7     purpose or they just weren't issued them,  
8     we've got workers without film badges, working  
9     around an area where you know that there are  
10    certain locations outside the betatron  
11    building, outside the ribbon doors, in the  
12    bathroom, on the roof.

13                  There were places where people  
14    could physically be located, where the  
15    radiation fields and mR per hour could have  
16    been pretty high.    Now how much time they  
17    spent there, maybe negligible.

18                  Now we also have information there  
19    were certain locations, I think it was outside  
20    the ribbon door, where people would  
21    congregate, that they may have spent some time  
22    there, and the radiation field there is pretty

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1 high, depending on how the betatron was being  
2 operated.

3 So I mean we have locations that -  
4 - where people could have been spending some  
5 period of time, where they could have gotten a  
6 substantial exposure, but they weren't wearing  
7 the film badge.

8 MEMBER BEACH: They were not  
9 issued.

10 DR. MAURO: Or weren't issued a  
11 film badge. This all goes -- now this is  
12 within the context of the betatron. This also  
13 was in the context of the non-destructive  
14 testing of radioisotopes, which is going on  
15 also. So it applies there, too.

16 Maybe, you know, now in theory, if  
17 you have a really good health physics program,  
18 where you are controlling your radiation  
19 fields, you're making sure you're meeting your  
20 stated limits, and that's well-documented, you  
21 know, one could argue that you know no one got  
22 more than the radiation protection limits.

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1                   You know, I mean if you say, okay,  
2     let's --

3                   DR. ANIGSTEIN:    Except when I was  
4     given information by the worker who maintained  
5     the fan on top of the building, and I  
6     specifically said, and when you had to go up  
7     there, did you communicate with the betatron  
8     operator like don't shoot, I'm up there, and  
9     he said no.

10                  He went in.    He didn't go through  
11     the control room.    He accessed it from the  
12     outside and there was no communication.  
13     That's firsthand testimony.

14                  CHAIRMAN ZIEMER:    I want to ask  
15     this question.    How much is he like a betatron  
16     operator?    In other words --

17                  DR. ANIGSTEIN:    But he's not --  
18     but according to NIOSH, he's not assigned the  
19     betatron operator's dose.

20                  CHAIRMAN ZIEMER:    And that's why I  
21     asked the question.    How much is he like a  
22     betatron operator?    To argue that he was up

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1 there every time the betatron was going --

2 DR. ANIGSTEIN: No, no.

3 CHAIRMAN ZIEMER: That's one  
4 thing. If he's up there once a year --

5 MEMBER BEACH: Which we don't  
6 know.

7 (Simultaneous speakers.)

8 MR. DUTKO: Dr. Ziemer?

9 CHAIRMAN ZIEMER: One comment.

10 MR. DUTKO: One comment on the  
11 film badge.

12 (Simultaneous speakers.)

13 CHAIRMAN ZIEMER: Hold up. Yes,  
14 go ahead.

15 MR. DUTKO: Sir, we were ordered  
16 not to wear our film badges. Probably we had  
17 100 at the peak of our department in its  
18 prime, maybe 70 percent of those people were  
19 film-badged. Magnaflux was the remaining part  
20 of the department. Magnaflux was a starting  
21 job. Those people were not issued film badges  
22 at all.

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1           I might work eight hours in a  
2   betatron on the a.m. I was ordered to take my  
3   film badge off any time I left the betatrons,  
4   and I would work in 10 Building right outside  
5   the ribbon door, maybe on a tank hold, on the  
6   second -- on overtime on the second shift.  
7   But the reason they did not want us to wear  
8   our film badges was burning, welding, hot  
9   sparks flying all over in those areas. They  
10  were afraid of badge damages, sir.

11           CHAIRMAN    ZIEMER:           Yes, I  
12  understand that, and actually you would still  
13  be classified as a betatron operator.

14           MR. DUTKO:   Yes, sir.

15           CHAIRMAN    ZIEMER:    In this model.  
16  Now we're talking about people who never were  
17  classified as betatron operators, and I'm kind  
18  of asking the question, even if there were  
19  occasional exposures to them outside the  
20  facility, do those rise to the level of saying  
21  that they deserve the same assigned dose.

22           That's a good rhetorical question

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1 right now, but that's --

2 DR. ANIGSTEIN: But they were  
3 given the skyshine dose, which does not  
4 account for any of the exposures in the SC&A  
5 model.

6 CHAIRMAN ZIEMER: Well, I don't  
7 know if it does.

8 DR. ANIGSTEIN: Pardon?

9 CHAIRMAN ZIEMER: The only way you  
10 can answer that would be to say how often were  
11 they up there, see. You can't simply say  
12 because of the dose rate. I don't think you  
13 can argue because of a dose rate, that they  
14 ever got an annual dose.

15 We don't know. So I say if you're  
16 modeling, then you have to make some kind of  
17 assumption that this is either pretty regular  
18 or it's once a month or something. How do you  
19 distinguish?

20 DR. MAURO: I have a problem with  
21 this. You have people that were, let's say,  
22 betatron operators, and mechanistically, we

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1 all agree here's how we're going to predict  
2 their exposures. We don't -- let's say we're  
3 pre-1964. Okay, we want to assign some dose,  
4 and we know he's a betatron operator.

5 I'm saying right now that we could  
6 come up with a model that would say, I think  
7 that this mechanistically would place a  
8 plausible upper bound on the exposures this  
9 man might have experienced as a betatron  
10 operator, and there's a scientific basis for  
11 it.

12 But now what I'm hearing you say,  
13 Paul, though, is that well, there were other  
14 people that were out there that weren't  
15 betatron operators. But they were sort of in  
16 the vicinity where the radiation field may  
17 have been elevated, certainly above the .72 mr  
18 per hour.

19 MEMBER BEACH: Sometimes.

20 DR. MAURO: Sometimes. So you  
21 know what we can do? We can sort of cure all  
22 things by saying well, let's give them the six

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1 rem per year, too. But there's no mechanistic  
2 relationship there. You see, I see that as  
3 being --

4 CHAIRMAN ZIEMER: No, I'm not  
5 saying we should. I'm arguing for the fact  
6 that that maybe a different distribution  
7 should be used.

8 DR. MAURO: Yes. Oh, okay, okay.  
9 I misunderstood that. So are you saying  
10 let's just throw those in the basket?

11 CHAIRMAN ZIEMER: Oh no, no. I'm  
12 saying on that basis, would you argue that  
13 they should get the same assigned dose?

14 DR. MAURO: You couldn't, and you  
15 wouldn't know what to assign them.

16 CHAIRMAN ZIEMER: Well, you might.  
17 I mean if you could construct a reasonable --  
18 (Simultaneous speakers.)

19 DR. ANIGSTEIN: It could be done,  
20 but again, my point is .72 mR per hour, it  
21 does not account for a lot of other exposure  
22 conditions. It only accounts for --

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1                   CHAIRMAN ZIEMER:   Maybe it depends  
2                   on how long you're assigning that for.  I mean  
3                   I don't think you can argue that a .72 mR per  
4                   hour doesn't cover a 20 mR per hour.  If the  
5                   .72 is, you know, a thousand hours a year and  
6                   the other one was one hour.

7                   DR. MAURO:    So 2,400, 2,400 hours  
8                   a year.

9                   CHAIRMAN ZIEMER:   You have to  
10                  state the parameters of your model.  
11                  Otherwise, dose rate is not as important as  
12                  total dose.

13                  DR. MAURO:    I agree.

14                  CHAIRMAN ZIEMER:   Anyway.  We're  
15                  going to, on Issue 5 and 6 sir, again we'll  
16                  keep those open pending further informing  
17                  them.  I'm wondering if Issue 7, dose  
18                  reconstruction not based on the best available  
19                  science, that this had to do with the  
20                  irradiated uranium and the model, let's see.

21                  Twenty-fold error in calculating  
22                  dose rate from irradiated uranium, which they

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1 found in the computer program. Is that, NIOSH  
2 says the comment appears to be assessing the  
3 accuracy of the dose estimate, rather than the  
4 ability to do it?

5 DR. MAURO: Right.

6 CHAIRMAN ZIEMER: So it's not --

7 DR. MAURO: It's an SEC issue.

8 CHAIRMAN ZIEMER: But it is in  
9 error. Is that being checked on, that --

10 MR. ALLEN: Yes. Santa hasn't  
11 actually found the exact place where the error  
12 is, but I don't necessarily doubt it. I kind  
13 of balked when I first saw those numbers  
14 originally, and then the rate that it decayed  
15 off.

16 I realized well, it's possible for  
17 them to x-ray something, get that kind of dose  
18 rate, get it back and Mallinckrodt could get a  
19 more technical dose rate when it got back  
20 there. So I suppose it's possible it could  
21 happen without being caught.

22 DR. ANIGSTEIN: If he wants to get

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1 in touch with me or with the -- we can  
2 certainly point that out to her. But she's  
3 using the files.

4 MR. ALLEN: So I mean I'm assuming  
5 that this is correct. We haven't zeroed in on  
6 --

7 (Simultaneous speakers.)

8 DR. MAURO: It's a calculation  
9 error. We can show where we think it is.

10 DR. NETON: But if we agree that  
11 this is not an SEC issue, can we take it off  
12 of this matrix? I mean this has been on here  
13 for --

14 CHAIRMAN ZIEMER: Well, I just  
15 want to agree that you'll just confirm it, and  
16 then we can close it, even if it's on the  
17 matrix.

18 DR. NETON: Yes. It should remain  
19 on the profile matrix for sure.

20 CHAIRMAN ZIEMER: Right.

21 MEMBER MUNN: You're not going to  
22 close it.

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1 DR. ANIGSTEIN: I mean, this is  
2 only one of the errors that is most notable.

3 CHAIRMAN ZIEMER: Let's just ask  
4 that it be closed. I mean, confirm that and  
5 we'll close it next time.

6 (Simultaneous speakers.)

7 DR. MAURO: I think there were a  
8 lot of places in our report that we point out  
9 differences of opinion, places where I think  
10 maybe an error was made. But these are all  
11 tractable.

12 So I've been thinking about we,  
13 you know, the day will come when we'll deal  
14 with those. I'm more concerned about this CD  
15 we're going to get, to see what kind of -- and  
16 whether there's full badge data. Now we're  
17 where we should be. That's where the SEC is.

18 CHAIRMAN ZIEMER: Right. Is this  
19 next one in a similar category, the  
20 underestimate of beta dose, Issue 9?

21 DR. ANIGSTEIN: This is the  
22 Puzier. This is the Puzier effect, where I

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1 will -- I think we will -- let's just say at  
2 this point that --

3 (Simultaneous speakers.)

4 CHAIRMAN ZIEMER: Well, it's being  
5 covered under TBD-6000.

6 DR. MAURO: Right, yes. Then as  
7 it applies specifically here, it has to do  
8 with the geometry of exposure and duration of  
9 exposure. So again, this is a tractable  
10 issue. What assumptions do you want to make  
11 regarding how much time were these folks up  
12 close and personal, to a Puzier, and get core  
13 slice? This is a tractable problem.

14 DR. ANIGSTEIN: I think, based on  
15 the offline discussion I had earlier, I don't  
16 think it applies to the Mallinckrodt data.

17 DR. MAURO: Yes, the same thing,  
18 and maybe it's not even -- maybe it's a non-  
19 issue, if it's a fresh ingot that doesn't have  
20 any --

21 (Simultaneous speakers.)

22 DR. MAURO: That's true, too. All

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1 of this is --

2 DR. ANIGSTEIN: I would say I  
3 think we will consider withdrawing this  
4 comment.

5 DR. MAURO: You want to withdraw?

6 MR. KATZ: You might want to  
7 explain that a little bit. I think you should  
8 explain it for the record.

9 DR. MAURO: Put that in a write-  
10 up?

11 (Simultaneous speakers.)

12 MR. KATZ: Okay, or the write-up,  
13 whatever.

14 DR. MAURO: We have to write a  
15 second report.

16 DR. ANIGSTEIN: Oh, you mean a  
17 write-up?

18 MR. KATZ: Yes, because you didn't  
19 discuss, you know, you were discussing that in  
20 the hallway or whatever, but you didn't discuss  
21 it on the record.

22 DR. ANIGSTEIN: Yes, right. Okay.

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1 Yes.

2 CHAIRMAN ZIEMER: So SC&A is going  
3 to give us an additional response on that.

4 DR. MAURO: We have two action  
5 items on this account. One is this 15  
6 millirem per hour issue, and the reasons we  
7 think it happened, and the second is, has to  
8 do with maybe the Puzier effect really is not  
9 in play here.

10 MR. KATZ: But there are some  
11 other issues from the TBD Site Profile review  
12 that kind of combine with that. I mean if the  
13 Puzier effect is real at certain sites, you  
14 were going to publish some new numbers.

15 DR. MAURO: The numbers go up.

16 MR. KATZ: I forget what you were  
17 going to do. But early on, I think there was  
18 a commitment on your part to provide some  
19 documentation about the Puzier.

20 DR. MAURO: Well, we can actually  
21 make that a part. In other words --

22 MR. KATZ: That's what I'm saying.

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1 Put it in a report.

2 DR. MAURO: The doses go up and if  
3 the Puzier is real here, there are some  
4 reasons why maybe it's not, and then the  
5 Puzier goes away.

6 CHAIRMAN ZIEMER: As I understand  
7 it now, if it's fresh uranium that has been  
8 separated, it has no thorium to start with --

9 (Simultaneous speakers.)

10 DR. ANIGSTEIN: And as a matter of  
11 fact, there is justification.

12 CHAIRMAN ZIEMER: I think John or  
13 somebody asked about virgin uranium or  
14 somebody --

15 (Simultaneous speakers.)

16 DR. ANIGSTEIN: And asked about  
17 the different uraniums --

18 (Simultaneous speakers.)

19 CHAIRMAN ZIEMER: -- you may not  
20 have gotten the right answer there. Virgin,  
21 fresh uranium, freshly-separated uranium  
22 without the thorium there, you don't have the

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1 effect.

2 DR. ANIGSTEIN: Yes, and as a  
3 matter of fact, I know --

4 CHAIRMAN ZIEMER: And anything  
5 that goes in is evenly distributed.

6 DR. ANIGSTEIN: As a matter of  
7 fact or, I now recall there was something in  
8 the Mallinckrodt TBD which said the opposite,  
9 that the dose rates are actually lower than  
10 they would be expected because the thorium  
11 wasn't there.

12 CHAIRMAN ZIEMER: Okay. We're up  
13 to Issue 10. Lack of consistency in assigning  
14 external exposures. It says, due to a  
15 calculational error, Allen and Glover assigned  
16 a disproportionately high exposure rate to  
17 workers handling uranium following  
18 radiography.

19 NIOSH said the comment appears to  
20 be discussing the accuracy of the dose  
21 estimate rather than the ability to estimate  
22 dose. So it's more appropriate to discuss it

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1 as part of the Appendix BB. But this has to  
2 go -- do with, let's see --

3 MR. ALLEN: It's the factor of 20  
4 issue on the uranium that --

5 DR. ANIGSTEIN: That's right, one  
6 case. Then on the other hand, we disagree  
7 with steel, and we find that there is -- with  
8 the steel, there is some significant  
9 activation of the steel, because it's not pure  
10 iron. The other alloys give you longer-lived  
11 isotopes than just pure iron. So the alloys  
12 have other elements.

13 MEMBER MUNN: The alloys.

14 CHAIRMAN ZIEMER: You're talking  
15 about nickel and what else is typically in  
16 steel?

17 DR. ANIGSTEIN: Molybdenum.

18 CHAIRMAN ZIEMER: Molybdenum,  
19 that's fine.

20 DR. ANIGSTEIN: Yes.

21 CHAIRMAN ZIEMER: Is the point  
22 here those weren't considered in the

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1 activation?

2 DR. ANIGSTEIN: They were not. I  
3 simply said well, the worst you -- in other  
4 words, they just said iron 57 is the main  
5 product. If you have less than 100 percent  
6 iron, then you'll get less iron 57, and then  
7 iron 57 does not -- is an insignificant dose,  
8 so the whole thing goes away.

9 We took the actual alloy H180,  
10 that we were told was most commonly used, and  
11 did the details MCMP-X.

12 CHAIRMAN ZIEMER: With the  
13 activation calculation, you came up with a  
14 different dose rate.

15 DR. ANIGSTEIN: Yes.

16 MEMBER MUNN: Much higher, I would  
17 think.

18 CHAIRMAN ZIEMER: And how much  
19 higher was it?

20 DR. ANIGSTEIN: Well, we got  
21 essentially, let's see. Depending on whether  
22 -- for instance, we got about 5.9, oh, I'm

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1       sorry.   Those are hours.   Not terribly high.  
2       It's a small contribution to the overall dose  
3       to the betatron operators.

4                   CHAIRMAN ZIEMER:    Okay.    So in  
5       part, this deals with simply the accuracy of  
6       the calculation.

7                   DR. ANIGSTEIN:    Yes, it does, it  
8       does.

9                   CHAIRMAN ZIEMER:    But the actual  
10      contribution    may    not    be    significant,  
11      particularly with respect to the model itself,  
12      but --

13                  MEMBER MUNN:    Well, the finding  
14      itself doesn't say anything about incorrect  
15      selection of materials.    We're now looking at  
16      Issue 10, right?

17                  CHAIRMAN ZIEMER:    Yes.

18                  DR. ANIGSTEIN:    Yes.    Not here.  
19      We did in the main, in the review, but it was  
20      not a --

21                                       (Simultaneous speakers.)

22                  CHAIRMAN ZIEMER:    This seems to

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1 focus on the -- well, it says exposure to the  
2 betatron --

3 (Simultaneous speakers.)

4 CHAIRMAN ZIEMER: Well, I guess on  
5 this, two things have to happen. One is, was  
6 this -- this was discussed, I guess, in the  
7 SEC Petition Evaluation Report apparently: the  
8 steel. It must have had part of bounding  
9 dose, without pulling it up to see. Do you  
10 recall, Dave?

11 MR. ALLEN: I honestly can't  
12 recall this.

13 DR. ANIGSTEIN: No, I don't  
14 believe it does. It's simply -- the SEC  
15 Evaluation Report essentially adopts the  
16 Appendix BB model.

17 CHAIRMAN ZIEMER: Okay. So this  
18 showed up in the Appendix BB model?

19 DR. ANIGSTEIN: Yes, yes.

20 CHAIRMAN ZIEMER: So but this is -  
21 -

22 DR. ANIGSTEIN: But the SEC

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1 Evaluation Report incorporates it by  
2 reference, shall we say.

3 CHAIRMAN ZIEMER: So this is kind  
4 of an Appendix BB issue.

5 DR. ANIGSTEIN: Yes, it is.

6 CHAIRMAN ZIEMER: Not a Site  
7 Profile issue.

8 (Simultaneous speakers.)

9 CHAIRMAN ZIEMER: Yes. It's not  
10 an SEC issue. So --

11 DR. ANIGSTEIN: Only in talking  
12 about the, I guess you might call it the  
13 fairness doctrine, where workers in one year  
14 get six rems and another year get one or two  
15 rems, and according to our analysis, they  
16 should be pretty much the same.

17 CHAIRMAN ZIEMER: Well, NIOSH, in  
18 their response, suggested that this be  
19 reviewed or removed from this matrix and put  
20 back into Appendix double B.

21 DR. ANIGSTEIN: Okay.

22 CHAIRMAN ZIEMER: Is there any

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1 objection to doing that? So we'll close the  
2 issue. So we'll agree to move that to  
3 Appendix BB.

4 MEMBER BEACH: And then are we  
5 doing the same thing with nine? Is that going  
6 to 6000?

7 DR. ANIGSTEIN: Well, the nine, I  
8 think we're going to withdraw that.

9 MEMBER BEACH: Oh nine, okay,  
10 okay.

11 CHAIRMAN ZIEMER: They're going to  
12 explain their reasoning and then withdraw the  
13 issue.

14 MEMBER BEACH: Okay. I guess I  
15 wrote that on eight instead of nine. Thank  
16 you.

17 CHAIRMAN ZIEMER: Okay. That's  
18 where we are on those issues. I'm looking  
19 back here on my agenda. We want to talk about  
20 Bliss & Laughlin and we want to talk about  
21 Electro-Metallurgical. Let's take a ten-  
22 minute break.

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1 MR. KATZ: A break, yes.

2 CHAIRMAN ZIEMER: A ten-minute  
3 break, and then we'll return and talk about  
4 Bliss & Laughlin.

5 MR. KATZ: Okay. So about quarter  
6 of, we'll start back up.

7 CHAIRMAN ZIEMER: Quarter after.

8 MR. KATZ: Quarter past, right.  
9 Quarter past.

10 MS. COGGINS: This is Pat Coggins,  
11 the petitioner.

12 CHAIRMAN ZIEMER: Yes.

13 MS. COGGINS: I wanted to clear  
14 something up that was brought up earlier, and  
15 I'm going to have to get off the conference  
16 call.

17 CHAIRMAN ZIEMER: Okay, sure.

18 MS. COGGINS: The date of the --  
19 the beginning date --

20 MR. KATZ: Would you guys stop  
21 talking?

22 MS. COGGINS: --of the petition

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1 for the employees.

2 CHAIRMAN ZIEMER: The what? Say  
3 it again?

4 MS. COGGINS: The question about  
5 that being 52 or 53. This was before the  
6 lunch break?

7 CHAIRMAN ZIEMER: Right.

8 MS. COGGINS: Okay. I have a  
9 letter from Larry Elliott, acknowledging that  
10 he had received my petition. The original  
11 date was January 1, 1950 through January 31st,  
12 1973. This is dated February 28th, 2008 from  
13 the Department of Health and Human Services.

14 Then on the final, which is  
15 10/3/08, also signed by Larry Elliott, 39  
16 pages, and this is where the date says January  
17 1, 1953 through December 31, 1966, and the  
18 residual period from January 1, 67 through  
19 December 31st, 1992.

20 Then NIOSH changed that in this  
21 evaluation, and they put an actual date on it,  
22 you know, from January 1, 1953 through June

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1 30th, 1966. They had made a few changes there  
2 on it in the -- when they evaluated it.

3 So I did want to clear that up  
4 with you, and they should have -- I can give  
5 you the SEC number if anyone needs a copy of  
6 it.

7 CHAIRMAN ZIEMER: No, I think we  
8 have the SEC.

9 MS. COGGINS: Okay. Well those  
10 are all signed by Larry Elliott, so if you  
11 need any clarification, you should be able to  
12 find it there.

13 CHAIRMAN ZIEMER: I believe, and  
14 maybe Ted, I don't know if you can clarify  
15 this. I think the dates are the ones  
16 established by Labor for that site, are they  
17 not?

18 MR. KATZ: I believe so.

19 CHAIRMAN ZIEMER: So that those  
20 could differ from your original petition. Is  
21 that what you're asking, why they differ?

22 MS. COGGINS: Yes, and I thought

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1 that you just couldn't read my handwriting on  
2 the original one.

3 CHAIRMAN ZIEMER: No. If your  
4 petition covered a period that, under the law,  
5 is not part of the official period that has  
6 been designated by the Department of Labor as  
7 the covered period, then it would have had to  
8 have been changed. So we can only evaluate  
9 those periods that the Department of Labor has  
10 designated as covered periods.

11 MS. COGGINS: Okay, all right. I  
12 understand. Yes, you know, if you could hear  
13 your conversation, it does sound like it  
14 wasn't real legible. I thought well, that  
15 sounds like my handwriting.

16 CHAIRMAN ZIEMER: I'm sure that  
17 was not the case.

18 MS. COGGINS: Okay, all right.  
19 Thank you so much.

20 CHAIRMAN ZIEMER: Thank you.  
21 We're going to take a break.

22 (Whereupon, the above-entitled

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1 matter went off the record at 3:07 p.m. and  
2 resumed at 3:22 p.m.)

3 CHAIRMAN ZIEMER: We have on our  
4 agenda some initial look at Bliss & Laughlin  
5 Steel, and an initial look at Electro-  
6 Metallurgical. At our full face Board meeting  
7 in October -- is that when it was, October?

8 MR. KATZ: Yes.

9 CHAIRMAN ZIEMER: Board meeting,  
10 we asked SC&A to take an initial look at the  
11 evaluation reports on those two, and that is  
12 underway. We don't have information back from  
13 them yet, but I've asked John Mauro to give us  
14 a status report.

15 I should point out on the agenda,  
16 Item 6, where I said, determine if an SC&A  
17 review is needed to clarify SEC issues, I had  
18 made a notation in my notes that we hadn't yet  
19 asked them to do that, whereas in the review  
20 of the minutes and the clarification by Ted  
21 Katz to jog the Chair's memory, we actually  
22 had already tasked them.

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1           So they had in fact gotten  
2           underway on Bliss & Laughlin, as well as  
3           Electro-Metallurgical, which I had the correct  
4           notation on. So both of these should read  
5           status of the SC&A review and path forward.

6           So John, first on Bliss &  
7           Laughlin, if you'd kind of tell us where you  
8           are on that and then we obviously will have to  
9           deal with some documentation once we get that.

10          But where are you on that and can you give us  
11          any preliminary sort of heads up.

12                 DR. MAURO: Both those projects  
13                 have been assigned. Bill Thurber -- Bill, are  
14                 you on the line?

15                 MR. THURBER: I am.

16                 DR. MAURO: And was Chick able to  
17                 be on line? I know he might have been tied up  
18                 this afternoon.

19                 MR. THURBER: I don't believe he  
20                 is, John. But I can cover it.

21                 DR. MAURO: Right. Could you just  
22                 give us a summary of where we are on Bliss &

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1 Laughlin and then Electro-Metallurgical.

2 MR. THURBER: Okay.

3 DR. MAURO: Thanks.

4 MR. THURBER: As you -- probably  
5 everyone knows, NIOSH has indicated that they  
6 have enough information to do bounding dose  
7 calculations for both facilities. I'm sorry.

8 Bliss & Laughlin is, in principle, a pretty  
9 straightforward proposition. There was only a  
10 few days of uranium machining over a couple of  
11 years.

12 And we -- in our review thus far,  
13 we haven't found any substantive issues of any  
14 kind. There's a lot of minor details, that  
15 sort of thing. Probably our only concern when  
16 we wind this up is that, as is the case in  
17 several of these, we don't feel that when  
18 NIOSH says they can do a bounding dose  
19 reconstruction, that they're sufficiently  
20 prescriptive in how they would go about that.

21 I expect a lot of our comments  
22 will be in that vein. For instance, the

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1 report on Bliss & Laughlin is silent on what  
2 you do, if anything, between the machining  
3 campaigns. These things we feel probably need  
4 to be spelled out, so that people understand  
5 how to treat it.

6 But beyond that, I don't think  
7 there's anything particular to say about Bliss  
8 & Laughlin at this time.

9 DR. MAURO: Bill, could you just  
10 give a quick description of the years, and  
11 what they were doing --

12 MR. THURBER: Well, they were  
13 doing some machining operations using a  
14 special piece of milling equipment, and the  
15 work was done in 1951 and 1952, and it was on  
16 a subcontract from Fernald. In that period,  
17 in 1951 and 1952, there were five one-day  
18 machining campaigns.

19 They do have some dust, some air  
20 sampling data available. This special machine  
21 is a machine that's made by a company named  
22 Medart, and apparently it has the ability to

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1 turn long cylindrical shapes of uranium, to  
2 machine the surface.

3 I think I gather it kind of works  
4 more like a -- in a standard lathe, you kind  
5 of have the rod suspended from centers on each  
6 end, and it's rotated on those centers. In  
7 this kind of operation, I think it's more like  
8 a centerless grinder, where the rod kind of  
9 floats in front of the tool.

10 So that's about it, really. As I  
11 said, it was just these five days of machining  
12 over a two-year period.

13 DR. MAURO: How much air sampling  
14 data do you have?

15 MR. THURBER: Oh, probably a dozen  
16 or so samples, something like that.

17 DR. MAURO: Breathing zone and  
18 general or just general?

19 MR. THURBER: Breathing zone and  
20 general, yes. Breathing zone and general.  
21 The reliance, though, in the bounding approach  
22 is the information in TBD-6000, where they

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1 look at the machining operations that are  
2 discussed in there, and they pick the most  
3 conservative values under the various  
4 machining operations for which there is data  
5 in TBD-6000, and that happens to be a  
6 centerless grinder, and use that as their  
7 bounding calculation.

8 DR. MAURO: So the air sampling  
9 data that's specific to this facility is a way  
10 of verifying whether --

11 MR. THURBER: It's a way of  
12 verifying and I'm pretty sure it looks  
13 conservative. But conservative in the sense  
14 that TBD-6000 gives higher values than the  
15 available air sampling data.

16 CHAIRMAN ZIEMER: Thank you, Bill.  
17 Let me ask if the petitioner is still on the  
18 line and has any questions at this time.  
19 Obviously, we are awaiting the written report  
20 from SC&A, at which time we will have -- the  
21 Work Group will have a chance to react to the  
22 findings, and discuss these issues in more

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1 detail, as will the petitioner.

2 But is the petitioner still on the  
3 line for Bliss & Laughlin?

4 MEMBER BEACH: I believe she said  
5 she had to go when she spoke to us before the  
6 break. That's what she mentioned.

7 DR. MAURO: Paul, I think to point  
8 out that both sites though, are put on a  
9 calendar for site visits. One of our  
10 responsibilities is to talk to workers and  
11 petitioners. So that hasn't happened yet.

12 CHAIRMAN ZIEMER: Right.

13 MR. THURBER: And to the --  
14 whether that's necessary on Bliss & Laughlin,  
15 we haven't discussed it internally, and so we  
16 don't have a position. It may not be  
17 necessary.

18 CHAIRMAN ZIEMER: Right.

19 MR. THURBER: On the other hand,  
20 there's a number of more substantive questions  
21 on ElectroMet.

22 CHAIRMAN ZIEMER: Okay. Just a

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1 notation here. Thank you. We'll come back to  
2 ElectroMet in just a minute. Just as an  
3 oversight, and I was just reminded that I  
4 skipped over 5b on the agenda.

5 I didn't specifically ask Dr.  
6 McKeel about his issues on the SEC petition,  
7 although I had assumed that many of those were  
8 related to the newer documentation in any  
9 event.

10 But, Dan, if you're still on the  
11 line, this didn't intend to not give you the  
12 opportunity to make further comments.

13 MEMBER BEACH: Paul, I just got a  
14 note from Mark. He wants to know if we're on  
15 the line. He can't hear anything. So I just  
16 thought we'd check with him.

17 MEMBER GRIFFON: No, No. That was  
18 a while ago. Thanks, though.

19 CHAIRMAN ZIEMER: Dr. McKeel, are  
20 you --

21 DR. McKEEL: Yes sir, I am. I had  
22 a very short comment.

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1                   CHAIRMAN ZIEMER:       I'm sorry I  
2       didn't specifically ask you for comments on  
3       the SEC Petition Evaluation Report or the  
4       matrix, either one.

5                   DR. McKEEL:       Right.    I had two  
6       short comments.  One comment was to remind the  
7       Work Group that, before the October the 14th  
8       Work Group meeting, I submitted a rather  
9       detailed commentary, pretty much section by  
10      section on the SEC 105 Evaluation Report.

11                   I would very much appreciate it if  
12      the Work Group could look at that and some of  
13      the issues definitely overlap with ones we've  
14      discussed today, and the SC&A findings matrix.

15      But there were other issues that in  
16      particular relate to the way you bound the  
17      dose, and a different perception that I have.

18                   Apparently, the way that NIOSH,  
19      and let's just say that NIOSH does the  
20      bounding doses, where if they have multiple  
21      sources, they pick the one with the highest  
22      dose, and use that as the bound for all the

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1 other source terms.

2 In my little illustration that I  
3 put in there, it seems to me that the more  
4 proper way to do that is to make the  
5 calculation of the dose or the exposure  
6 contributed by each of the different sources,  
7 and that since doses are cumulative and many  
8 workers there could be exposed not  
9 simultaneously but one after the other or a  
10 mix of those sources, that you really, before  
11 setting a bounding dose you really have to  
12 calculate the contributions of each of the  
13 sources, which definitely has not been done up  
14 to this point. That's one comment.

15 The other comment is to please  
16 just look at the section on the uranium source  
17 terms at Mallinckrodt, because I really don't  
18 feel that the issue of the dingots and the  
19 outer crust on the dingots and what that would  
20 contribute to dose, I don't believe that's  
21 been adequately addressed and I certainly,  
22 after the comments today by SC&A, we went into

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1 -- I went into a detailed discussion of why we  
2 now believe that in fact the original  
3 testimony that we gave about GSI workers and  
4 how they actually did corner shot, glancing  
5 betatron shots of uranium ingots and dingots,  
6 is actually true.

7 We have much more information  
8 about that, and we provided that in this  
9 critique to the Work Group.

10 We believe now, based on documents  
11 and reports, that a major reason those  
12 glancing shots were done was not to examine  
13 the internal structure of the uranium ingot  
14 core, but to actually define that interface  
15 between the magnesium fluoride crust that  
16 always adhered to a dingot after it came out  
17 of the bomb, and was always shaggy and of  
18 different thicknesses, to define that  
19 interface so that the dingots could go back to  
20 Mallinckrodt, and then have the crust lathed  
21 off and expose just the pure uranium core,  
22 without digging into it and losing the

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1 valuable uranium.

2           So that supposition, particularly  
3 -- well, NIOSH made a supposition that there  
4 was sort of an idealized rectangular slab and  
5 SC&A reasoned that, because the betatron  
6 couldn't possibly calculate, I mean penetrate  
7 the full 18-inch diameter or thickness of an  
8 ingot, that they must have used only slices at  
9 GSI.

10           We believe that that is really an  
11 incorrect supposition, and that needs to be  
12 calculated into the doses delivered, because  
13 we think the radiographers, the people who  
14 handled those dingots, were exposed to a much  
15 larger dingot with an outer crust on it. So  
16 that's that.

17           Then the final thing is, as I  
18 listen to the discussion of the findings, and  
19 was reading through SC&A's findings on the SEC  
20 Evaluation Report, I was struck in many  
21 instances that the primary finding was really  
22 not addressed in the NIOSH comments.

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1           In particular, on Finding Number  
2     1, the way that was expressed by SC&A was  
3     pretty powerful. They said that, because  
4     there was no badge data, no exposure data for  
5     1953 to 64, that a bounding dose could not be  
6     calculated for the external doses.

7           Yet all the discussion and the  
8     commentary and NIOSH's responses were related  
9     to incidents. Well, I would agree with  
10    Chairman Ziemer, that the incidences, you  
11    know, they're at many centers, most, there are  
12    probably many unreported accidents and  
13    instances, and they're never really figured in  
14    dose calculations.

15           But the overall statement that  
16    SC&A had, that the bounding dose could not be  
17    determined for those ten years. If you put  
18    that in conjunction with what John Mauro has  
19    said repeatedly, that's a huge problem. If  
20    that's not resolved in favor of NIOSH, and if  
21    NIOSH doesn't address it, then that would be  
22    reason in and of itself to give an SEC to GSI

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1 and overturn NIOSH's recommendation to deny  
2 that SEC.

3 So that's a huge issue, and I  
4 believe that NIOSH should respond directly to  
5 the primary finding. So I hope that will  
6 happen before these issues close. Anyway, I  
7 appreciate the opportunity to put that on the  
8 record.

9 I will be happy to cooperate with  
10 getting this information, so that NIOSH can  
11 get the information from the NRC FOIA, and I  
12 just appreciate the Work Group allowing us to  
13 interact with them and provide input.

14 CHAIRMAN ZIEMER: Okay, thank you  
15 Dan. Just for clarification, I think the  
16 earlier communication that you referred to  
17 might have been the one on October 9th.

18 DR. McKEEL: Yes sir.

19 CHAIRMAN ZIEMER: I'll just call  
20 this out, so that the Work Group members can  
21 double-check it back in their records as well  
22 as NIOSH and SC&A. It's a communication dated

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1       October 9th, and the subject line says  
2       "Addendum Petitioner Findings, SEC 105  
3       Evaluation." Is that the correct one Dan?

4                     DR. McKEEL: Yes sir.

5                     CHAIRMAN ZIEMER: And then that  
6       talks about the iridium and the 250 kVP X-ray  
7       source terms and the oblique betatron corner  
8       shots and related information.

9                     DR. McKEEL: Yes. It's about 30  
10       pages long, yes sir.

11                    CHAIRMAN ZIEMER: Now and there's  
12       -- that was the cover memo and then there's a  
13       couple of attachments there?

14                    DR. McKEEL: Yes sir.

15                    CHAIRMAN ZIEMER: Okay. So that  
16       should be in the mix. As we get this other  
17       material and take a look at --

18                    DR. McKEEL: Okay. That would be  
19       wonderful.

20                    CHAIRMAN ZIEMER: -- at the source  
21       terms and the monitoring data, to ask NIOSH to  
22       look at that in the mix and let's make sure

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1 that we address these issues in some way or  
2 another.

3 DR. McKEEL: I appreciate that.

4 CHAIRMAN ZIEMER: Yes.

5 DR. McKEEL: Thank you.

6 CHAIRMAN ZIEMER: Now let's go on  
7 to Electro-Metallurgical Corporation, and Bill  
8 Thurber again is going to report on that?

9 MR. THURBER: Yes.

10 CHAIRMAN ZIEMER: Bill, what do  
11 you have for us on that?

12 MR. THURBER: Just by way of  
13 background, what was done --

14 CHAIRMAN ZIEMER: Oh hang-on, just  
15 before you talk. This is a TBD-6001 facility.

16 DR. MAURO: Yes. Both are under  
17 the TBD-6000 and 6001.

18 CHAIRMAN ZIEMER: Well, but Bliss  
19 & Laughlin is 6000.

20 DR. MAURO: 6000, yes.

21 CHAIRMAN ZIEMER: I believe this  
22 one is 6001.

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1 MR. THURBER: That's correct.

2 CHAIRMAN ZIEMER: And I need to  
3 ask where we are on 6001, as far as the main  
4 document is concerned?

5 DR. MAURO: I don't think we've  
6 met specifically for that one. We've only met  
7 on 6000.

8 CHAIRMAN ZIEMER: I don't think we  
9 have either. I'm asking. But remind me,  
10 because I didn't look it up. Did you review  
11 6001? I thought you did.

12 DR. MAURO: Oh yes. We have a  
13 stand-alone report.

14 CHAIRMAN ZIEMER: Is there a  
15 matrix on it?

16 DR. MAURO: And there was a  
17 matrix.

18 CHAIRMAN ZIEMER: Okay.

19 DR. MAURO: And by the way --

20 CHAIRMAN ZIEMER: I was trying to  
21 find my matrix, and I couldn't find it.

22 DR. MAURO: I certainly will

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1 provide it.

2 CHAIRMAN ZIEMER: I think it goes  
3 back a ways.

4 DR. MAURO: Oh yes.

5 MR. ALLEN: One piece of  
6 information. I might be wrong, but if I'm  
7 remembering right, I know 6000 and 6001 are  
8 defaults for essentially have no data or very  
9 limited data.

10 CHAIRMAN ZIEMER: Right, right.

11 MR. ALLEN: If I remember right,  
12 the ElectroMet appendix, even though it's  
13 assigned to 6001, I think we had ElectroMet  
14 data, most of those defaults were not used.

15 CHAIRMAN ZIEMER: Weren't used.  
16 Okay. So it's Appendix C of this.

17 DR. MAURO: That's correct. But  
18 it's not --

19 CHAIRMAN ZIEMER: That's an  
20 important point, because the question I was  
21 going to raise was whether or not it was  
22 important to address 6001 matrix issues prior

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1 to addressing this one. I think what I'm  
2 hearing is this may be self-sufficient.

3 MR. ALLEN: If I'm remembering  
4 correctly.

5 DR. MAURO: Bill, from my  
6 conversation, it sounds like they've got a lot  
7 of data on ElectroMet.

8 MR. THURBER: Yes, they do, and  
9 certainly in our review of the Petition  
10 Evaluation Report, interwoven into that will  
11 be comments relating to Appendix C of TBD-  
12 6001, which is specifically directed toward  
13 ElectroMet.

14 CHAIRMAN ZIEMER: But are there  
15 any 6001 issues per se that have be resolved  
16 prior to addressing Appendix C?

17 MR. THURBER: I don't think so.

18 CHAIRMAN ZIEMER: Okay.

19 MR. THURBER: I haven't looked at  
20 that specifically. I don't think anybody at  
21 SC&A has, but I don't think that there are any  
22 issues of that kind at this point anyway.

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1                   CHAIRMAN ZIEMER:     Okay.     As you  
2     guys develop your report, if you identify  
3     6001-specific issues that need to be resolved,  
4     if you would point those out, because if  
5     that's the case, we'll need to go back.

6                   I kind of put this on the back  
7     burner, because we haven't had any 6001  
8     facilities to deal with. But now that we do,  
9     it may call that whole matrix into our  
10    limelight. Okay, thanks. Proceed.

11                  MR. THURBER:        Okay.        Anyways,  
12    operations at ElectroMet began in April of  
13    1943, and ended in June or the end of June of  
14    1953. What they did at ElectroMet, they  
15    received green salt, uranium tetrafluoride  
16    from Linde. They reduced the green salt in  
17    bombs, mixing it with magnesium metal and  
18    reducing the uranium tetrafluoride, uranium  
19    metal.

20                  Then they recast the derbies in a  
21    vacuum induction furnace to produce billets  
22    that were shipped elsewhere for fabrication,

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1 for extrusion, rolling or whatever. They also  
2 received some uranium metal scrap, which they  
3 then remelted in the vacuum induction  
4 furnaces, to produce additional uranium  
5 billets.

6 One of the interesting things  
7 about ElectroMet was that the facility was  
8 specially built under government contract, and  
9 it was built in a corner of a large industrial  
10 site where the Electro-Metallurgical Company  
11 did a lot of other things.

12 They produced ferro-alloys, which  
13 are the kinds of additions you use in  
14 steelmaking. They produced calcium carbide,  
15 which is used to make acetylene.

16 They had a large ongoing  
17 industrial operation, and this facility, which  
18 they called the area plant, was kind of in a  
19 fenced-off area in a corner of the property.

20 Now the thing, one of the things  
21 that I think needs to be carefully examined is  
22 this. The petition says that it addresses all

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1 of the employees at the Electro-Metallurgical  
2 Corporation, and I think that that needs to be  
3 carefully examined in the light of the fact  
4 that this was a -- basically a satellite  
5 operation, and it was -- had its own guards  
6 and gated area, and there was very little  
7 mixing of personnel.

8           There is some evidence that there  
9 were some maintenance people that went into  
10 the facility two or three days a year, and  
11 some other maintenance facility people that  
12 might have gone in a couple of days a month.

13           But there's this -- I haven't been  
14 able to find how big the work force was and  
15 the scope of the operations, the commercial  
16 operations, at ElectroMet were, but they were  
17 substantial.

18           So to bring all those people into  
19 this group that's under review as a Special  
20 Exposure Cohort, I think may overstate the  
21 case.

22           And along that line, one of the

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1 reports with one of the interviewees, it was  
2 clear that the person that they interviewed  
3 had no involvement whatsoever with the uranium  
4 processing operations.

5 He was a worker in the rest of the  
6 plant, if you will, and so there is this open  
7 question then, as to who worked there and who  
8 didn't and who should be included.

9 One of the petitioners, there were  
10 two -- there are actually two petitions, and  
11 one of the petitioners said that the people  
12 should include all the ElectroMet employees  
13 who worked in the 50 by 219 building, and that  
14 refers to the size of this area plant that was  
15 specifically built for the AEC work,  
16 originally the Manhattan Engineering District  
17 work, and that petition was merged with the  
18 other petition, and this distinction of all  
19 the workers in the 50 by 219 foot building  
20 disappeared. So as I say, I think this is,  
21 could be a substantive issue.

22 There are a lot of data at

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1 ElectroMet for the period -- well, let me back  
2 up a second. As I mentioned, they began  
3 production there in 1943, April 1943, and they  
4 were producing uranium about 40 tons a month,  
5 and they continued to do that through some  
6 time in late 1946.

7 Then the plant was put on stand-  
8 by. Then about a year later, they began  
9 operation again and they continued operation  
10 until September of 1949, at which time the  
11 plant went back in stand-by. There's some  
12 evidence, very poorly documented, that there  
13 might have been some work done there in -- at  
14 the beginning of 1951.

15 It obviously wasn't production  
16 work because there's -- well, apparently it  
17 wasn't production work. The records don't  
18 indicate that there was any production work.  
19 So for all intentional purposes, beyond  
20 August-September of 1949, there would have  
21 been very little exposure.

22 So there is some air sampling data

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1 from 1944. There is urinalysis data from  
2 1944. There is lots of air sampling data,  
3 film badge data and some urinalysis data for  
4 the period 1948-49. So what's missing really  
5 is data for 1945-46 period. I'm sorry, 1943,  
6 1945 and 1946.

7 NIOSH makes the case that there  
8 was sufficient continuity of the operations  
9 and lack of process improvement from the  
10 beginning of operations until 1948, that it is  
11 not unreasonable to extrapolate the 1948-49  
12 data back to the period '45-'46. Obviously,  
13 that's an assumption that we're critically  
14 analyzing, to see whether we concur with that  
15 or not.

16 I think that's kind of the main  
17 features of the situation right now. Again,  
18 there's a lot of detail, and I'm sure we will  
19 end up with questions. Because they use  
20 Appendix C of TBD-6001 to support their  
21 bounding approach, we will have questions  
22 about whether what they say is sufficiently

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1 prescriptive.

2 In other words, is the median good  
3 enough, the kind of conversation we had this  
4 morning at some length.

5 CHAIRMAN ZIEMER: Okay, very good.

6 Bill, can you or John Mauro give us a  
7 preliminary time line as to when the Work  
8 Group would expect the final product from this  
9 effort?

10 Are we talking about a few weeks,  
11 are we talking about a month, a day? Where  
12 are we on this? I'm not pushing for any  
13 particular time. I just want to get an idea,  
14 because I think before we meet again, we'll  
15 want to have these two documents in hand, and  
16 we'll also want to have the NIOSH stuff in  
17 hand.

18 MEMBER BEACH: And the matrix  
19 6001?

20 CHAIRMAN ZIEMER: Well, the 6001  
21 matrix will not be important unless they  
22 identify it as an issue. I thought initially

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1 we were going to have to do that, but there  
2 apparently is a lot of data, and the question  
3 is whether that data can extrapolate back to  
4 the earlier times.

5 DR. MAURO: That sounds like where  
6 we are right now, in terms of where the key  
7 issue is.

8 CHAIRMAN ZIEMER: Yes. Are we  
9 talking about having this by February?

10 DR. MAURO: Not for the February  
11 meeting.

12 CHAIRMAN ZIEMER: No, no, and we  
13 wouldn't be meeting at that time.

14 DR. MAURO: Bill, you know you're  
15 -- keeping in mind that I think this is  
16 probably going to DOE, so you want to slip a  
17 couple of weeks into that, I'll leave it to  
18 you to give me a sense. Then of course as the  
19 entire -- after you're done and Chick is done,  
20 it will go through our internal review.

21 MR. THURBER: Right, and you know,  
22 I'm sure we're going to have some serious

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1 internal discussions.

2 DR. MAURO: Now one other thing  
3 too, Bill. this particular site, I think, is  
4 especially important for a site visit, to  
5 confirm this assumption that the nature of the  
6 operations, ventilation systems, controls, et  
7 cetera, and what transpired, was more or less  
8 uniform between '43 and '49.

9 MR. THURBER: That's correct.  
10 That's indeed correct, and how successful  
11 we're going to be in finding people that  
12 actually worked there and not in the rest of  
13 ElectroMet, I don't know how that's going to  
14 go frankly. I just don't know.

15 CHAIRMAN ZIEMER: We are talking  
16 about sixty-some years ago.

17 DR. MAURO: You may not be able to  
18 do --

19 CHAIRMAN ZIEMER: If a person is  
20 still surviving, they're 85 or 90.

21 DR. MAURO: Yes.

22 MR. THURBER: If they were 20 in

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1 1945.

2 CHAIRMAN ZIEMER: And that's still  
3 pushing it.

4 DR. MAURO: Well, the only reason  
5 I bring it up is that very often, part of our  
6 SEC work usually includes some type of visit  
7 to people. But very often, that follows. In  
8 other words, we'll put our product out with an  
9 appendix that's left blank, allowing that to  
10 catch up, because very often that takes some  
11 time.

12 So for the purpose of scheduling,  
13 let's assume that the appendix, if there is  
14 going to be one, that deals with the site  
15 visit or whatever we would call it, data  
16 capture or whatever, you know, that that's  
17 going to be something that will follow.

18 So basically it's, you know, for  
19 the work that you're doing with Chick right  
20 now and others, for example, when do you think  
21 there would be a draft ready that could get  
22 into the internal SC&A pipeline?

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1 MR. THURBER: Mid-January.

2 DR. MAURO: Mid-January, okay.

3 MR. THURBER: For both of them.

4 DR. MAURO: Okay. So it sounds  
5 like --

6 MR. THURBER: I think clearly the  
7 Bliss & Laughlin is a much simpler proposition  
8 than this one.

9 DR. MAURO: So the draft in my  
10 hands or let's say the review hands, we're  
11 talking about a month from now, and then  
12 another month after that to go through DOE  
13 clearance and so forth.

14 CHAIRMAN ZIEMER: So mid-February.

15 DR. MAURO: So we're talking mid-  
16 February, perhaps right after the full Board  
17 meeting. That's probably as good a guess as  
18 anything.

19 CHAIRMAN ZIEMER: Okay. So

20 MS. WOJCIK: May I ask a question  
21 before the ending of the day?

22 CHAIRMAN ZIEMER: Sure.

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1                   MR. KATZ:    Yes.    Can you tell us  
2    who you are?

3                   MS. WOJCIK:    I'm Margaret.    I'm  
4    the petitioner for Bliss & Laughlin.

5                   CHAIRMAN ZIEMER:    Oh good, okay.  
6    Very good.    Go ahead.

7                   MS. WOJCIK:    You had mentioned  
8    earlier some machining operations done in 1951  
9    and '52, subcontracted from Fernald.    There  
10   were only five one-day machining operations.  
11   Where does that information come from?

12                   CHAIRMAN ZIEMER:    Bill, can you  
13   answer that, or do we need Chick on the line  
14   or --

15                   MR. THURBER:    Well, that comes  
16   from the Petition Evaluation Report.

17                   DR. MAURO:        You mean the  
18   evaluation -- ER, the ER.

19                   MR. THURBER:    Yes, the Evaluation  
20   Report, and you know, it comes from obviously  
21   from review of the available records.

22                   MS. WOJCIK:    Well, we have here at

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1 the bottom of 17, in the SEC Petition  
2 Evaluation Report, "Contaminated levels  
3 removed in 1998 tells us there were higher  
4 levels between '48 and '52. What does that  
5 tell us about the levels that were present?"

6 MR. THURBER: I'm sorry. Where  
7 are you quoting from?

8 MS. WOJCIK: Page 17, the bottom  
9 of our SEC Petition Evaluation Report. Page  
10 17 on the bottom.

11 MR. THURBER: Okay. I'm going to  
12 have to pull that up and take a look.

13 DR. MAURO: Maybe I -- could I say  
14 something here? We're right in the middle of  
15 the process right now. There's no doubt that  
16 one of the things we do is look at every  
17 reference that stands behind the positions  
18 taken in the ER. So that we will confirm. So  
19 we do have an obligation to confirm that  
20 assumption.

21 In other words, if there's any  
22 reason to believe that the number and the

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1 extent of the operations is somewhat different  
2 than as represented in the ER, we will  
3 investigate that. So I mean -- so you may be  
4 pointing something out and we would very much  
5 be interested in hearing more about that.

6 MR. THURBER: But that was from  
7 the petition, the NIOSH Petition Evaluation  
8 Report; is that correct?

9 MS. WOJCIK: This is from not  
10 NIOSH. SEC Petition Evaluation Report that I  
11 received June 30th, 2009. The Evaluation  
12 Report of the SEC petition.

13 CHAIRMAN ZIEMER: Now that's the  
14 NIOSH report.

15 MR. THURBER: Okay.

16 DR. NETON: I haven't seen that.  
17 I don't see what she's talking about.

18 MR. THURBER: Let me. I'm trying  
19 to pull it up here.

20 DR. NETON: I've got it up here.

21 MEMBER MUNN: It says remediation  
22 began in late 1998.

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1 DR. NETON: I don't see what  
2 you're referring to, ma'am.

3 CHAIRMAN ZIEMER: It's page 17,  
4 did you say?

5 MS. WOJCIK: Yes, page 17.

6 CHAIRMAN ZIEMER: And what line or  
7 where in the report? We have it pulled up  
8 here now.

9 DR. NETON: Yes, I have it in  
10 front of me.

11 CHAIRMAN ZIEMER: So Dr. Neton is  
12 looking at page 17 now. And where on the page  
13 should he be looking?

14 MS. WOJCIK: I've got the fourth  
15 line down, "Remediation of Bliss & Laughlin  
16 site."

17 MEMBER MUNN: "Began in late  
18 1998." The last paragraph on the page.

19 DR. NETON: "Remediation began in  
20 1998 and continued through 1999." Okay, I see  
21 that.

22 CHAIRMAN ZIEMER: Yes, okay. Then

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1 what was the question then?

2 MS. WOJCIK: Okay. At the bottom  
3 of page 17, I have here "Contaminated levels  
4 removed in '98 tells us there were higher  
5 levels between '48 and '52." So whether Bliss  
6 & Laughlin had only five one-day machining  
7 episodes or not, it's right in writing here.

8 DR. NETON: I'm not seeing that.

9 MS. WOJCIK: The levels were high.

10 MR. THURBER: I'm sorry. Are you  
11 reading "Remediation of the Bliss & Laughlin  
12 site began in late 1998, and continued through  
13 March 1999"?

14 MS. WOJCIK: No. You know what?  
15 Okay. I might have something different here.

16 DR. NETON: Yes. That's not in  
17 the report.

18 MR. THURBER: Okay. But I would  
19 make this comment, that the report does  
20 address, I believe it addresses the period  
21 after the actual machining ceased, and  
22 considers the exposure during the residual

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1 period, which would be -- I think this one  
2 does.

3 DR. NETON: It should.

4 MR. THURBER: It should. I know  
5 that the ElectroMet report does not, but --

6 CHAIRMAN ZIEMER: Well, let's see.  
7 We need to clarify what the question is then.  
8 Did you say that you --

9 MS. WOJCIK: Okay. What it said  
10 is that contaminated levels removed in '98  
11 tells us there were higher levels between '48  
12 through '52. What you had said earlier was  
13 that there were five, only five one-day  
14 machining episodes at Bliss & Laughlin.

15 MR. THURBER: Right. They were in  
16 '51 and '52, and --

17 MS. WOJCIK: So whether there were  
18 just five or more, there were still higher  
19 levels of contamination then in those years.

20 MR. THURBER: I can't comment on  
21 that without understanding the document that  
22 you're working from.

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1 DR. NETON: It seems like what  
2 it's trying to say is that during the period  
3 where they were processing the uranium, there  
4 were higher levels than what was measured in  
5 the residual period, in 1998; is that correct?

6 MS. WOJCIK: Yes.

7 DR. NETON: Yes. Well, that would  
8 make sense. I mean during the years where  
9 they were actually machining the uranium or  
10 doing something to it, you would have higher  
11 levels. It could certainly have. It points  
12 to a 1948 date, which doesn't make sense.

13 MR. THURBER: No. That makes no  
14 sense at all.

15 DR. NETON: We need to see the  
16 document that you're referring to.

17 CHAIRMAN ZIEMER: Is this a  
18 different document from the Evaluation Report?

19 DR. NETON: I believe so, yes.

20 MEMBER MUNN: It has to be. It  
21 has the same first sentence in it, but after  
22 that --

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1 MS. WOJCIK: Okay. Who can I send  
2 a copy of this to?

3 CHAIRMAN ZIEMER: Can you identify  
4 who's report it is to start with? You say it  
5 was a NIOSH report?

6 MS. WOJCIK: No. I've got SEC  
7 Petition Evaluation Report.

8 MEMBER MUNN: And on the top it  
9 says "SEC 00131"?

10 MS. WOJCIK: Yes.

11 MEMBER MUNN: 630-09 final, Bliss  
12 & Laughlin, and you're looking at page 17?

13 MS. WOJCIK: Yes.

14 MEMBER MUNN: It doesn't say the  
15 same thing as my page 17.

16 MS. WOJCIK: That's what it sounds  
17 like.

18 CHAIRMAN ZIEMER: Was there an  
19 earlier draft or --

20 DR. NETON: I don't think so. I'm  
21 looking at what's published on our website  
22 right now.

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1 MS. WOJCIK: Okay. Can I send a  
2 copy of what I have?

3 MR. KATZ: You know, that seems  
4 like the easiest thing to do.

5 DR. NETON: Yes.

6 CHAIRMAN ZIEMER: Yes. Who should  
7 she send it to, Ted?

8 MR. KATZ: You're welcome to send  
9 it to me actually.

10 CHAIRMAN ZIEMER: Send it to Mr.  
11 Katz, who's our federal official.

12 MR. KATZ: And I will distribute  
13 it.

14 CHAIRMAN ZIEMER: And can you send  
15 it electronically, or do you need to mail it?

16 MS. WOJCIK: No, I will mail it.

17 MR. KATZ: You do not have it  
18 electronically?

19 MS. WOJCIK: Well, it will  
20 probably come through in pieces. I'd just as  
21 soon put it in the U.S. mail.

22 MR. KATZ: Okay, because it's

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1 actually much easier for me to distribute it  
2 if you send it to me by email than if you send  
3 it to me --

4 MS. WOJCIK: I can try.

5 MR. KATZ: -- in paper. I don't  
6 necessarily need the whole thing at first,  
7 depending on what it is. If it's something  
8 that we have, then all I really need is enough  
9 to be able to identify it.

10 MEMBER MUNN: The first 17 pages.

11 CHAIRMAN ZIEMER: You need the  
12 first, the cover page --

13 MR. KATZ: Or even just the cover  
14 page will probably get us there. So you don't  
15 need to send the whole thing, although you  
16 know email, it shouldn't be that consuming a  
17 document in terms of --

18 CHAIRMAN ZIEMER: Well, it may  
19 depend on whether her electronic version is  
20 PDF. If it is, she may not be able to  
21 separate.

22 MR. KATZ: Right. Even so, it

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1 should be able -- you should be able to send  
2 it by email. So send it to me, and let me  
3 give you my email address.

4 MS. WOJCIK: Okay.

5 CHAIRMAN ZIEMER: Thank you very  
6 much. Okay. Then the other question I have  
7 before we conclude here, and I'll ask, I  
8 guess, Dave Allen and Dr. Neton, do you have  
9 any feel for how long it will take to analyze  
10 the information that you referred to, that Dr.  
11 McKeel identified?

12 I know you have to get it and it  
13 sounds like there's a lot there. That's  
14 likely to take -- well, I'm going to be  
15 surprised if you're able to have anything  
16 before February.

17 MR. ALLEN: I don't think so  
18 either, but I mean like you said, it's very --  
19 it sounds like a rich source of information.

20 CHAIRMAN ZIEMER: If you would  
21 plan on an update at our February meeting on  
22 where you are on the analysis of that data.

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1 MR. ALLEN: We can do that.

2 CHAIRMAN ZIEMER: Just for the  
3 Board meeting when we do the Work Group  
4 reviews. Just give us an update on where you  
5 are, or let me know in advance, so that when I  
6 report, because I don't want to set a meeting  
7 date until I know where we are on that.

8 Because that may be, that will be  
9 a more critical path, even than these other  
10 two, because there's more urgency. GSI has  
11 been on our radar screen for quite a while.  
12 Here's a whole new batch of information.

13 We've got to evaluate that,  
14 assimilate it and address it as quickly as  
15 we're able to within the parameters that are  
16 set by just work time limitations.

17 Because you have a whole lot of  
18 things going on. Everybody's petition is  
19 pressing, but I think as soon as we can get  
20 that.

21 MR. ALLEN: So you want  
22 essentially like an email to you --

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1                   CHAIRMAN ZIEMER:     That would be  
2     fine.

3                   MR. ALLEN:     To the rest of the  
4     Working Group too?

5                   CHAIRMAN ZIEMER:     Yes, you can  
6     copy everybody. I just want it reported at  
7     the full Board meeting, when we talk about the  
8     Work Group reports, because this is very  
9     important.

10                  MR. KATZ:     And whether there will  
11     be a Mallinckrodt data capture. That's sort  
12     of question in this too, right?

13                  CHAIRMAN ZIEMER:     Well, there was  
14     some question about whether it might be at  
15     Mallinckrodt, some of those film badge  
16     records. But you'll have to look at the scope  
17     of what Dr. McKeel has identified, and  
18     determine --

19                  DR. NETON:     Some of that might  
20     even depend on what we get from the Landauer  
21     report. So there's a number of things.

22                  CHAIRMAN ZIEMER:     The Landauer

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1       apparently only had the Picker part, I would  
2       guess.  But anyway, if you'll plan to report  
3       on that and I think it's premature for us to  
4       set the next date until we have a better idea  
5       of where we are on those three things, the GSI  
6       data and information, and then we'll get an  
7       update on SC&A on where they are.

8                   We may have their documents by  
9       then and be underway, and digesting those.  
10      But this will be critical to our next meeting.

11      Okay.  Any further comments or questions?  
12      Mark, are you still on the line?

13                   MEMBER GRIFFON:  Yes, I'm still  
14      on.

15                   CHAIRMAN ZIEMER:  Do you have  
16      anything else?

17                   MEMBER GRIFFON:  No, no.  I think  
18      I'm all set.

19                   CHAIRMAN ZIEMER:  You okay?  Okay.  
20      Any other --

21                   MEMBER BEACH:  Well, the only  
22      thing I have is on Dan McKeel's request that

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1 we review the SEC 105 petition. Are you going  
2 to comment back to him on these, or will the  
3 other two action items address --

4 CHAIRMAN ZIEMER: Well, on those  
5 items, I've asked NIOSH to --

6 MEMBER BEACH: I know they're  
7 intermixed.

8 CHAIRMAN ZIEMER: -- as they  
9 address it, because these have to do with the  
10 NIOSH evaluation, the Evaluation Report.

11 MEMBER BEACH: Correct. I guess  
12 my question is there's nothing the Work Group  
13 can do in answer to any of Dan's requests at  
14 this time?

15 CHAIRMAN ZIEMER: I don't think  
16 these are issues that the Work Group per se  
17 can address. I think they are questions  
18 phrased to NIOSH about their models.

19 So you know, if you look at this  
20 and you say well, you know, that's a "no,  
21 never mind," at least tell us why. If it's an  
22 issue, then you will need to address it.

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1                   I mean we don't know, and Dr.  
2                   McKeel is not necessarily claiming these are  
3                   show-stoppers, but they could be. We don't  
4                   know that at this point. So you'll have to  
5                   critique that.

6                   MEMBER BEACH:       There's actually  
7                   two of them, the October 9th and --

8                   CHAIRMAN ZIEMER:   Well, the cover  
9                   letter is October 9th. I'm looking to see who  
10                  was copied on this. It's the Work Group and  
11                  copied, Ted's copied, Larry, and Mauro. Dave,  
12                  you weren't copied on this.

13                 MR. KATZ:    I probably forwarded it  
14                 to him. I forward everything.

15                 CHAIRMAN ZIEMER:   Yes.    So make  
16                 sure you have it.

17                 MEMBER BEACH:   Well I was looking  
18                 at the December 14th one also.

19                 CHAIRMAN ZIEMER:   Well, that's  
20                 more recent and I referred to that earlier  
21                 today. We just go that a day or two ago.

22                 MEMBER BEACH:   Right.

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1                   CHAIRMAN ZIEMER:     And that had  
2     some -- that focused mainly on the new  
3     information that Dr. McKeel has discovered.

4                   MR. KATZ:     If you don't have it,  
5     let me know and I can send something to you.

6                   MEMBER BEACH:     I just wanted to  
7     make sure all those were addressed.

8                   CHAIRMAN ZIEMER:   I appreciate it.  
9     Very good. Okay. I think that concludes our  
10    business for today. I appreciate everybody's  
11    time and effort on this. It sometimes feels  
12    like we're making progress and sometimes it  
13    feels like for every step forward there's  
14    three more steps to go.

15                   But thank you all, and we'll keep  
16    plugging away at these issues and try to come  
17    to closure as rapidly as we can. So we are  
18    adjourned.

19                   MR. KATZ:     Thank you everyone on  
20    the telephone, Dr. McKeel, John Ramspott and  
21    all.

22                   (Whereupon,     the     above-entitled

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1 matter went off the record at 4:13 p.m.)

2

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