

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.)

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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.)

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