

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

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ADVISORY BOARD ON RADIATION AND
WORKER HEALTH

+ + + + +

WORK GROUP ON TBD-6000

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WEDNESDAY
MAY 12, 2010

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The Work Group meeting convened in the Zurich Room of the Cincinnati Airport Marriott Hotel, 2395 Progress Drive, Hebron, Kentucky at 8:30 a.m., Paul Ziemer, Chairman, presiding.

PRESENT:

PAUL ZIEMER, Chairman
HENRY ANDERSON, Member*
JOSIE BEACH, Member
MARK GRIFFON, Member
WANDA MUNN, Member
JOHN POSTON, Member

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ALSO PRESENT:

TED KATZ, Designated Federal Official
ISAF AL-NABULSI, DOE*
NANCY ADAMS, NIOSH Contractor*
DAVID ALLEN, DCAS
ROBERT ANIGSTEIN, SC&A
JOHN DUTKO*
SAMUEL GLOVER, DCAS*
EMILY HOWELL, HHS
JENNIFER LIN, HHS*
JOHN MAURO, SC&A
DAN McKEEL*
JAMES NETON, DCAS
JOHN RAMSPOTT*
WILLIAM THURBER, SC&A*

*Participating via telephone

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

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

2 (8:36 a.m.)

3 MR. KATZ: Welcome, everybody in
4 the room and on the line. This is Ted Katz,
5 Advisory Board on Radiation and Worker Health,
6 the TBD-6000 Work Group, and we are just
7 getting started, and we'll begin with roll
8 call.

9 We are discussing GSI today and
10 another site -- and Bliss & Laughlin, so
11 please, for all Agency-related people, note
12 your conflict of interest information, as
13 well, during roll call, beginning with the
14 Board Members in the room.

15 CHAIRMAN ZIEMER: Paul Ziemer,
16 Chair of the Work Group, not conflicted on GSI
17 or on Bliss & Laughlin Steel.

18 MEMBER MUNN: Wanda Munn, Board
19 Member, no conflicts.

20 MEMBER POSTON: John Poston, Board
21 Member, no conflicts.

22 MEMBER BEACH: Josie Beach, Board

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1 Member, no conflict.

2 MEMBER GRIFFON: Mark Griffon,
3 Board Member, no conflicts.

4 MR. KATZ: Thank you, and do we
5 have any Board Members on the -- on the line?

6 MEMBER ANDERSON: Yes, it's Henry
7 Anderson. I'm just going to listen, since
8 I'll be 6001.

9 MR. KATZ: Thank you. Thank you,
10 and you're not conflicted as well, is that
11 correct?

12 MEMBER ANDERSON: No.

13 MR. KATZ: Right. And then NIOSH-
14 ORAU Team in the room?

15 DR. NETON: Jim Neton, NIOSH, not
16 conflicted.

17 MR. ALLEN: Dave Allen, NIOSH, not
18 conflicted.

19 MR. KATZ: NIOSH-ORAU Team on the
20 line? Are you expecting any? Okay, SC&A in
21 the room?

22 DR. MAURO: John Mauro, SC&A, not

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1 conflicted.

2 DR. ANIGSTEIN: Bob Anigstein,
3 SC&A, no conflict.

4 MR. KATZ: And on the line, any
5 SC&A?

6 MR. THURBER: Bill Thurber, SC&A,
7 no conflicts.

8 MR. KATZ: Welcome, Bill.

9 MR. THURBER: Thanks.

10 MR. KATZ: All right. Federal
11 officials, HHS or other agencies or
12 contractors to the feds in the room?

13 MS. HOWELL: Emily Howell, HHS.

14 MR. KATZ: And on the line?

15 MS. LIN: Jenny Lin, HHS.

16 MR. KATZ: Hi, Jenny.

17 MS. ADAMS: Nancy Adams, NIOSH
18 contractor.

19 MR. KATZ: Hi, Nancy.

20 DR. AL-NABULSI: Isaf Al-Nabulsi,
21 DOE.

22 MR. KATZ: Welcome, Isaf.

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1 DR. AL-NABULSI: Thanks.

2 MR. KATZ: Okay, there are no
3 members of the public in the room. Any
4 members of the public on the line?

5 DR. MCKEEL: This is Dan McKeel.
6 I'm a GSI SEC co-petitioner.

7 MR. KATZ: Welcome, Dan.

8 DR. MCKEEL: Thank you.

9 MR. RAMSPOTT: This is John
10 Ramspott, General Steel advocate.

11 MR. KATZ: And welcome, John. Very
12 good. Then let me just remind you all on the
13 line to please mute your phones except when
14 you're addressing the group, *6 if you don't
15 have a mute button, and then *6 will take you
16 off mute again when you do want to speak to
17 us.

18 Please do not put the call on
19 hold. Hang it up and dial back in if you need
20 to break for a bit, and that's it. Thank you.

21 Dr. Ziemer.

22 CHAIRMAN ZIEMER: Okay, I will

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1 officially call the meeting to order. Thank
2 you all for being here and participating. We
3 sent out a revised agenda early in the week --
4 early in the week being like yesterday or,
5 actually, Monday.

6 The main revision was in item
7 4(d), where I had changed the general wording
8 so that we specifically had on our agenda
9 addressing some comments provided by the
10 petitioner this past week, so that was the
11 revision.

12 I did also forget to revise the
13 start time on the written agenda but sent out
14 a follow-up email, so your presence all here
15 indicates that you apparently got the email.
16 We really -- we're starting at 8:30 and not
17 9:30, so thank you all for the early start
18 time, which is for some a little bit of a
19 hardship in terms of time zones, but we
20 appreciate that, particularly for some of our
21 members who have planes to catch later in the
22 day.

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1 We will go through the agenda as
2 it's given. I haven't given time specifics on
3 any of the items, since that's very hard to
4 predict except that we do want to take our
5 lunch break about midday.

6 The outside time for adjournment
7 is 5:00. It's not a goal to be reached, but
8 it's a time limit, so if we can complete
9 things before that, that's fine, but we do
10 have a lot of items to cover.

11 Very specifically, in broad terms
12 we will look at the TBD-6000 matrix and the
13 resolution of issues on the matrix. We will
14 look at the Appendix and related matters in
15 terms of that document.

16 Then we want to also look at
17 Appendix BB matrix, which is the General Steel
18 Industries issues matrix, and then the General
19 Steel Industries SEC petition, which also has
20 a matrix for which we are going through the
21 resolution process. And then, finally, we
22 have Bliss & Laughlin Steel, and that will

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1 occur at the latter part of our meeting,

2 So I don't know if any of the
3 Bliss & Laughlin Steel people plan to be here,
4 and I think one or two other NIOSH people will
5 be joining us later in the day, as I
6 understood from --

7 DR. NETON: Sam will be on later.

8 CHAIRMAN ZIEMER: Sam Glover will
9 join us, I think, this afternoon, but we have
10 a couple items to address on Bliss & Laughlin
11 but probably won't be spending too much time
12 on that yet today but some carryover items on
13 that.

14 So, with those introductory
15 remarks, I'd like us to move to the TBD
16 findings matrix and the status of the various
17 issues. Now, Dr. Mauro provided for us what
18 was identified as the current copy of the
19 issues matrix, that is, the copy that has the
20 various responses and replies, and that was
21 updated through October 14 of last year.

22 We do have some things that we

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1 discussed in our last meeting, which was in
2 December, and I had -- I had prepared some
3 reminder notes for the Work Group Committee,
4 or the Work Group Members on the carryover
5 items.

6 That particular meeting was
7 actually held on December 16. Those notes I
8 sent out said it was December 12, but it was
9 actually the 16th, but in any event, there
10 were some items which we'll identify as we
11 proceed here.

12 It would -- if you want to follow
13 along, what John Mauro presented was material
14 which I think has already been distributed in
15 the past. It was a copy of the matrix, and
16 John also attached some White Papers that
17 we've had in the past, just in case you lost
18 track of them.

19 The paper on resuspension factors
20 was included, which is an October 2009 paper.

21 There was a White Paper from SC&A dealing
22 with, actually, NIOSH comments on issue 4,

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1 which was a NIOSH White Paper dated October
2 2009. That was dealing with the Adley data.

3 There was a NIOSH White Paper,
4 another one. Is it the same one? No, another
5 one dealing with the Adley data dated October
6 9, so we had those White Papers attached.
7 Actually, there was also a NIOSH -- no, an
8 SC&A White Paper dated October 13, which also
9 dealt with the surface contamination, I
10 believe. Yes.

11 So those are all White Papers
12 we've had in the past, and John just pulled
13 them together so you would have them all in a
14 group.

15 DR. MAURO: There's one more.

16 CHAIRMAN ZIEMER: Dr. Mauro, you
17 have a comment?

18 DR. MAURO: Yes, there's one more
19 important one that I neglected to include here
20 that was distributed, SC&A White Paper on
21 December 30, that is probably on your system
22 that I asked Nancy Johnson this morning to

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1 send everyone on the Board a copy of it. It's
2 an important one.

3 MEMBER GRIFFON: It's there.

4 DR. MAURO: And it's there, so
5 that's -- that brings -- as far as I know,
6 that brings us up to date on delivering to you
7 all the White Papers that we've completed --

8 CHAIRMAN ZIEMER: Right.

9 DR. MAURO: -- through the end of -
10 - through today.

11 CHAIRMAN ZIEMER: Right.

12 DR. MAURO: I'm sorry. I just
13 neglected --

14 CHAIRMAN ZIEMER: But these are not
15 new White Papers.

16 DR. MAURO: Nothing, no.

17 CHAIRMAN ZIEMER: And we should
18 have had them all --

19 DR. MAURO: Yes.

20 CHAIRMAN ZIEMER: -- in the past,
21 and I just want to double-check. Were the
22 copies that were distributed all PA cleared?

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1 Do the Petitioners have all of those?

2 DR. MAURO: It would be on the
3 bottom. I'd have to say --

4 CHAIRMAN ZIEMER: Well --

5 DR. MAURO: -- it's possible it's
6 not.

7 CHAIRMAN ZIEMER: I think one of
8 the problems is these initial drafts all were
9 the uncleared copies, but I believe these have
10 all been PA cleared since then.

11 MR. KATZ: I believe so.

12 CHAIRMAN ZIEMER: Emily, are you in
13 a position to double-check that?

14 MS. HOWELL: I mean, I know the one
15 that was sent this morning had a PA cleared
16 version.

17 MR. KATZ: Well, as a matter of
18 routine we've been PA clearing all of the GSI
19 materials.

20 CHAIRMAN ZIEMER: Right. Right. I
21 wanted to make sure.

22 MS. HOWELL: They're all old,

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1 though.

2 CHAIRMAN ZIEMER: As far as I know,
3 and Dan McKeel, if you're on the line I'll
4 just ask you. Are there any of those papers
5 that I identified that were not provided to
6 you originally, as well?

7 DR. MCKEEL: The one that I don't
8 know that I have is the one Dr. Mauro
9 mentioned was from December 30. Maybe the
10 title of that would help, but I don't think I
11 have that.

12 CHAIRMAN ZIEMER: That's the one
13 you said you just sent out this morning,
14 resent this morning?

15 MS. HOWELL: The resend this
16 morning had the non-PA cleared and a PA
17 cleared.

18 DR. MAURO: Okay.

19 CHAIRMAN ZIEMER: There is a PA
20 cleared version?

21 DR. MCKEEL: The PA cleared version
22 is this January 14.

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1 MR. KATZ: Okay, so that's it,
2 then.

3 DR. MCKEEL: Was that sent to me?

4 CHAIRMAN ZIEMER: If not, we can
5 probably resend it. I thought those had all
6 been distributed to the full list.

7 DR. MAURO: Probably, but I
8 wouldn't want to say without confirmation.

9 DR. MCKEEL: Okay. Thank you.

10 DR. NETON: The one that I received
11 this morning did not have Dr. McKeel on
12 distribution.

13 MS. HOWELL: No, because it had a
14 non-PA --

15 MR. KATZ: That's the non-PA
16 cleared.

17 MS. HOWELL: They're both non. If
18 you want to forward just the PA-cleared
19 version to him, you can.

20 DR. NETON: That's almost
21 impossible for me to do within the --

22 CHAIRMAN ZIEMER: Well, one of the

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1 problems we're having right now, and I think
2 it's a problem with the CDC main computers, is
3 getting emails out of our -- out of our NIOSH
4 computers here. I mean, Jim Neton sent me an
5 email earlier this morning, and it has not
6 arrived.

7 MR. KATZ: There's a network
8 problem.

9 CHAIRMAN ZIEMER: There's a network
10 problem, so, in any event, we'll try to get
11 that to you, Dan, to make sure you have it.

12 DR. MCKEEL: Thank you very much.

13 CHAIRMAN ZIEMER: Now --

14 MEMBER MUNN: I think this was sent
15 on January 14. The original one doesn't
16 appear to have Dan on distribution.

17 MR. KATZ: Yes, I mean, it gets
18 sent to Dan separately. It would not have it
19 on -- you would not show it on yours, because
20 Laurie Breyer normally sends them, and
21 sometimes I send them if I get them before
22 Laurie.

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1 MEMBER MUNN: Just asking. Okay.

2 CHAIRMAN ZIEMER: Okay. In any
3 event, we have the matrix, and last time we
4 had issue 1, which we were working with, and
5 we had a very long discussion on issue 1.
6 There were several carryover questions, and
7 I'm looking for my copy of those. Here they
8 are.

9 Incidentally, Board Members, Work
10 Group Members, on the notes that I sent you,
11 the reminder notes, if you go back to the
12 transcripts, because I gave you transcript
13 pages where we agreed to do certain things, I
14 have discovered that there are also several
15 versions of the transcripts.

16 There's the ones that come
17 directly from the transcribers, and then
18 there's the PA-cleared versions and the non-PA
19 cleared versions --

20 MR. KATZ: Certified versions.

21 CHAIRMAN ZIEMER: -- and those
22 things cause the page changes or the page

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1 numbers to change a little bit. So, for
2 example, I referenced this first one dealing
3 with the Putzier effect as being on page 68,
4 but I noticed the version I was working with
5 last night it shows up on page 65 for some
6 reason.

7 In any event, those are just
8 little sidelights in case you're tracking
9 these down, but on the first issue, I have a
10 note indicating that NIOSH agreed to add a
11 discussion of the Putzier effect in the one
12 they discussed in their White Paper in TBD-
13 6000 and that the TBD language would be
14 revised, so there is that issue, the revision
15 of TBD-6000 relative to that particular issue.

16 There were some related issues
17 dealing with the assigning of the dose values,
18 and those are discussed -- were discussed in
19 our last meeting, and we had also an
20 indication that SC&A would deliver an analysis
21 for us, and, John, you have done that, so we
22 have that.

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1 We'll come to that in just a
2 moment, but what I would like to ask now, on
3 the commitment to revise TBD-6000, do we know
4 when that will happen? And, in that context,
5 there are some other items which we may come
6 to a little later.

7 But, for example, the petitioner
8 on GSI has asked about other issues that might
9 show up in TBD-6000, and those are included in
10 the petitioner's points that we're going to
11 discuss in a -- a little later in the day, but
12 I'll just refer to that particular point from
13 Dr. McKeel's document.

14 It said TBD-6000 is evaluating the
15 MCW ingot -- section, no uranium alloy
16 section, no non-destructive testing section or
17 non-destructive testing, radiography detail
18 guidance for dose reconstruction, no thorium
19 section. Needs to be urgently revised and so
20 on.

21 In my view, we have agreed,
22 certainly, with the issues of the ingots,

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1 dingots and the uranium alloys and the thorium
2 and the non-destructive testing all need to be
3 addressed, although some of those might be
4 considered site-specific for General Steel
5 Industries, but we've already committed on the
6 intention on the thorium and the Putzier
7 effect, which then address dingots, ingots, I
8 guess, to include that in TBD-6000.

9 I'm not sure how general the other
10 radiography procedures are. In my mind right
11 now, that seems to me to be site-specific and
12 could be addressed in the individual
13 appendices unless there is some indication
14 that every site of this type does that.

15 Let's see. What would the other
16 one have been? Well, I guess -- I guess that
17 was the one that I had a question on, whether
18 that should be in TBD-6000 versus the Appendix
19 BB. Dave, did you have any comments on that?

20 MR. ALLEN: Well, I agree with
21 pretty much everything you just said. I don't
22 think the -- I don't know if radiography is

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1 generic enough to be in the body of TBD-6000.

2 It seems to be more of a site-
3 specific appendix -- for each site that has
4 that, and just to follow up with what you're
5 saying, we've already agreed that we were
6 going to revise TBD-6000 to deal with issues 1
7 through 3 --

8 CHAIRMAN ZIEMER: Right.

9 MR. ALLEN: -- on the matrix, and I
10 think it was the last meeting where we asked
11 for some clarification on issue 1, because we
12 had agreed the TBD would benefit from the
13 discussion, but we thought the numbers covered
14 it, and I wanted to clarify.

15 And the clarification was no,
16 there wasn't agreement that the numbers in the
17 TBD-6000 covered it, that issue was still on
18 the table, and that led to a long
19 conversation.

20 CHAIRMAN ZIEMER: Right.

21 MR. ALLEN: I think the final
22 answer was the White Paper that SC&A delivered

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1 in December, and I think that part has to be
2 discussed here a little bit, and if there is
3 some kind of agreement, then we're pretty much
4 set for TBD-6000 to revise.

5 CHAIRMAN ZIEMER: Ready to do the
6 revision.

7 MR. ALLEN: Right.

8 DR. MAURO: With regard to Dr.
9 McKeel's question on betatron, my sense is
10 that it is one of those special cases where it
11 doesn't -- wouldn't necessarily be appropriate
12 to make it as part of the generic TBD-6000.

13 However, it would also be helpful
14 to the better appreciation of the number of
15 facilities where betatron activities took
16 place. I don't think we really have a full
17 appreciation of that right now.

18 I do understand that there are
19 other facilities where betatron is used, and
20 the degree to which those facilities fall
21 within the scope of this program and perhaps
22 need to be looked at and included in dose

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1 reconstructions at those other facilities,
2 right?

3 So, from that regard, I don't
4 know. Has anyone looked at, you know, the
5 extent to which betatrons are fairly
6 widespread or very limited?

7 DR. ANIGSTEIN: There is a list in
8 -- Allis-Chalmers has -- in the Allis-
9 Chalmers publications, of which I have some
10 copies, of all the betatrons that were in
11 place throughout the country at that time.

12 There weren't that many, and they
13 were primarily -- there were more medical
14 facilities, and I think it actually started
15 out being used for medical, for radiation
16 therapy, and then started being used for
17 industrial radiography, but there weren't any
18 on the list that I can recall -- I'm a little
19 hesitant to say that, because I'm just going
20 from memory.

21 MEMBER MUNN: And that's the real
22 question, whether the other betatrons that

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1 were in use were involved in this program in
2 any way. Anything that is not really should
3 not be a topic for --

4 DR. MAURO: I agree, but I just
5 don't know, though.

6 DR. ANIGSTEIN: It's very uncommon.

7 DR. MCKEEL: Dr. Ziemer, may I
8 comment? This is Dan McKeel.

9 CHAIRMAN ZIEMER: Certainly, Dr.
10 McKeel.

11 DR. MCKEEL: Well, my comment is I
12 would refer you to a previously classified
13 document that we had unclassified by DOE at
14 some great effort, LAMS 1064, which deals with
15 non-destructive testing activities at the
16 three largest DOE facilities, Los Alamos,
17 Rocky Flats, and Oak Ridge.

18 In that document, it was quite
19 clear that the people at Los Alamos had a non-
20 destructive testing training program that was
21 applied throughout the DOE complex, and, in
22 fact, John Ramspott has entered in the serial

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1 numbers of the betatrons that were in use at
2 Los Alamos.

3 His list also included Allis-
4 Chalmers, which interestingly is a covered AWE
5 site, and there are -- there are more on that
6 list, and that's been entered into the record,
7 and I'm sure John can resupply that
8 information, but to say that this is only used
9 at General Steel is just absolutely incorrect.

10 The other issue in LAMS 1064 and
11 the point of my comment was we're not just
12 talking about betatrons. We're talking about
13 the class of particle accelerators.

14 We are also talking about non-
15 destructive testing by gamma sources, and it
16 was also very clear in LAMS 1064 that they
17 were extensively used. Gamma sources I'm
18 talking about now, cobalt, et cetera, at Oak
19 Ridge and at Rocky Flats.

20 So, Mr. Ramspott and I, our
21 perception is quite different, and we know
22 from reading now about steel plants in general

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1 that it would be an accurate statement to say
2 that every single steel plant, and there are
3 many such in this program, has to use non-
4 destructive testing to examine steel parts,
5 welds.

6 And, you know, if we had another
7 lifetime to research that, we could easily
8 turn up that information, but I'm talking
9 about Simonds Saw and Steel. I'm talking
10 about Bethlehem Steel. I'm talking about the
11 other DOE sites not mentioned in LAMS 1064
12 like Fernald, et cetera.

13 So, I would say that this is a
14 generic information. I would say that we have
15 provided a lot of the information to certainly
16 extend it beyond GSI and that that information
17 we're asking, please go over it. We've
18 presented that over time, and I believe that
19 information needs to be incorporated into TBD-
20 6000, because --

21 I'll just read you an example from
22 the Weldon Spring Site Profile talking about

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1 fuel tests. It says, "Uranium, like most
2 metals, shrinks on solidifying, and blowholes
3 and pipes are formed in the ingots," and then
4 I've underlined this from Mr. Ramspott.

5 "The amount of metal to be removed
6 by cropping in order to produce sound
7 materials for rolling is determined by the use
8 of high energy X-rays." It doesn't say gamma
9 rays. It says X-rays.

10 "This test has supplemented other
11 work in aiding the development of improved
12 casting techniques. Uranium alloys may be
13 cast in rounds or flats so that very little,
14 if any, machining is required for use. Such
15 bars may be tested by ultrasonic techniques
16 for soundness."

17 So there are at least isotopic
18 sources and particle accelerators that are
19 widely used throughout the AWE and DOE complex
20 for non-destructive testing.

21 CHAIRMAN ZIEMER: Okay. Thank you,
22 Dan, and I think we've all agreed with that.

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1 The question is whether or not a generic sort
2 of coverage of those kinds of devices should
3 be part of TBD-6000 or should be part of a
4 separate document on non-destructive testing
5 or something like that, so that's part of the
6 issue.

7 The betatrons are certainly a very
8 special way of doing it. The isotopic sources
9 are a different way of doing that. There are
10 other X-ray devices in the past that have been
11 used. The old radium sources were used in the
12 early days, so there's a variety of kinds of
13 approaches to non-destructive testing.

14 We're certainly aware they're used
15 in virtually all facilities, and, in addition,
16 at least in modern days, there is even
17 isotopic gauging devices used in some of these
18 kinds of facilities, as well, which is not
19 really non-destructive testing of the type
20 we're talking about but is another possible
21 use.

22 Dr. Mauro had another comment.

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1 DR. MAURO: Yes, two aspects of
2 that concern. One is the reason the non-
3 destructive testing issue, you know, really
4 came to the forefront, Appendix BB, is the
5 lack of film badge data from '53 to '64 and
6 issues surrounding that.

7 These other facilities that might
8 use the betatron or any other type of X-ray
9 device, radium source, if there is a
10 comprehensive film badge program in place at
11 the time, then it becomes certainly an issue
12 of concern that needs to be reconstructed, but
13 it becomes just another source of external
14 radiation exposure that has to be properly
15 dealt with through your dosimetry program.

16 Now, one of the things we did
17 learn and will probably be the subject of the
18 conversation is one of the difficult isotopes
19 in the past has been radium 226, and the
20 reason being is it wasn't -- it was used in
21 non-destructive testing, but it wasn't
22 regulated by the Nuclear Regulatory Commission

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1 or the Atomic Energy Commission at the time.

2 So we have, in our minds, some
3 question about who had regulatory oversight in
4 the early years when radium 226 was being used
5 for non-destructive testing, and it seems to
6 me that once the NRC licensed the source,
7 there was a degree of oversight, not only film
8 badges but a radiation protection program.

9 But in years -- let's say in the
10 fifties, let's say, there was a facility such
11 as -- I think we're going to be talking about
12 this, where radium was the source. There's
13 some question about, you know, adequate
14 radiation protection, how do we know what the
15 doses were, that sort of thing.

16 CHAIRMAN ZIEMER: Okay. Thank you
17 for that comment. Any other --

18 MR. RAMSPOTT: Dr. Ziemer?

19 CHAIRMAN ZIEMER: Yes?

20 MR. RAMSPOTT: This is John
21 Ramspott. May I make a comment on Dr.
22 McKeel's remarks?

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1 CHAIRMAN ZIEMER: Yes, John.

2 MR. RAMSPOTT: In listing the
3 identification of Allis-Chalmers as the only
4 manufacturer of betatrons or one of the main
5 is actually incorrect. Betatrons were
6 manufactured by General Electric. There is
7 photographic proof of that in numerous
8 articles that I found. Siemens.

9 There are multiple manufacturers
10 of the betatron, so the betatrons were more
11 widely used. The Allis-Chalmers betatrons
12 were essentially 80 of them that we found.

13 CHAIRMAN ZIEMER: Yes.

14 MR. RAMSPOTT: I think that's a
15 very big issue. Then another big thing about
16 the badges that John's talking about now, the
17 badge programs would definitely -- would
18 possibly catch the betatron activity if they
19 were also the badges that would pick up the
20 neutron dose, because the betatrons, if I
21 understood correctly, when they're running are
22 creating neutrons, and if you don't have the

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1 right badge -- like at GSI, even on the badge
2 info we do have, you miss the neutrons, so not
3 including that on every site that had one
4 would probably be a mistake, too.

5 CHAIRMAN ZIEMER: Okay. Thank you.

6 MR. RAMSPOTT: Thank you.

7 CHAIRMAN ZIEMER: Well, so one of
8 the issues on the revision of TBD-6000 is
9 whether or not to include the non-destructive
10 testing as part of that document or whether to
11 handle it as a site-specific thing -- it could
12 be done either way -- or whether a separate
13 generic non-destructive testing document of
14 some sort is needed.

15 I don't know at this point if
16 we're in a position to answer the larger
17 question on behalf of either the Board or the
18 Agency. We certainly, in this particular
19 instance, if we don't revise TBD-6000 to cover
20 it, we have to address it specifically in the
21 GSI document, and one could, of course, later
22 develop a generic document to cover other

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1 facilities in general or to establish some
2 general principles.

3 You would still need site-specific
4 addressing these things for particular cases,
5 but maybe get some reaction here on what to do
6 in this particular case, whether or not we
7 want to ask NIOSH to consider revising TBD-
8 6000 to cover this broadly.

9 I mean, there are certainly big
10 differences between betatron for non-
11 destructive testing and the radium source for
12 non-destructive testing or an X-ray, a regular
13 X-ray unit or whatever.

14 MEMBER MUNN: In the absence of
15 concrete data with respect to each and every
16 site that we might need to call to look upon,
17 experientially those of us who have ever done
18 any work in this know very clearly that non-
19 destructive testing varies so widely from one
20 site and from one application to another that
21 it would seem to be very difficult to me to
22 establish something like a generic pattern

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1 that one is expected to follow in a program
2 like this.

3 It just would appear to be almost
4 required as a site-specific matter, rather
5 than a generic one. I don't see how you could
6 -- you could build a life's work on
7 identifying a generic kind of approach to such
8 a varied set of sites.

9 CHAIRMAN ZIEMER: I suppose the
10 generic approach would be one where you knew
11 in general that they were doing non-
12 destructive testing but lacked details on
13 either the -- well, the types of sources or
14 the frequencies, or you had to make some
15 assumptions.

16 MEMBER MUNN: And the types of
17 materials.

18 CHAIRMAN ZIEMER: Yes.

19 MEMBER MUNN: It's such a wide
20 range.

21 CHAIRMAN ZIEMER: So it's a
22 difficult problem.

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1 DR. MAURO: But if you've got the
2 TLD film badge, I mean, because that's --

3 CHAIRMAN ZIEMER: Well, then, but
4 you don't always have that, particularly in
5 the early days, maybe. Jim, did you have some
6 thoughts on this?

7 DR. NETON: Well, it's a difficult
8 issue. I mean, for the most part, it seems
9 like the non-destructive testing is not going
10 to be normally related to DOE or the AEC
11 activities, although that doesn't get us
12 anywhere, because, as we know, IG-003 says
13 that all --

14 CHAIRMAN ZIEMER: Right.

15 DR. NETON: -- sources of exposure
16 to ionizing radiation need to be covered.

17 Where you have these sort of small
18 facilities or AWEs that process some uranium,
19 it may be true that there was non-destructive
20 testing, but if we have no evidence if that --
21 I'm not quite sure how we would address it,
22 although I do recall at one point the

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1 Environmental Protection Agency actually went
2 back and looked at distributions of exposure
3 to various Classes of workers in the country
4 by decade.

5 I'm aware of a pretty thick
6 publication by -- I think it was a person
7 named Kumazawa who generated the distribution.

8 In general, I think we might be able to use
9 that as a starting point, because I think
10 radiographers would want an accounting of --

11 DR. MAURO: That 1984 report does
12 ring a bell.

13 DR. NETON: I believe so, yes, and
14 he went back. He was sort of a visiting
15 scientist from Japan, worked for the EPA,
16 generated a very, pretty comprehensive list of
17 the distributions of exposures from various
18 work categories.

19 Radiography stuck out, because I
20 think it is probably the highest category of
21 the workers he evaluated. There is some data
22 there that could be used as a starting point.

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1 In fact, I think we might have a
2 document within our files that speaks to that.

3 I'm not sure where else we would go. It
4 certainly would need to be covered.

5 CHAIRMAN ZIEMER: Okay. Well, on
6 issue 1, we've already agreed to the revision
7 on the Putzier effect. It appears that the
8 Work Group is suggesting that on non-
9 destructive testing in this case that we
10 address that within the parameters of the GSI
11 document for that facility at the moment.

12 MR. ALLEN: It's been our
13 experience in the individual appendices --

14 CHAIRMAN ZIEMER: Right.

15 MR. ALLEN: -- side by side if
16 things become -- if we start seeing a generic
17 type of pattern, then it would either be a
18 revision to TBD-6000 or, like you said, a
19 separate TIB --

20 CHAIRMAN ZIEMER: Right.

21 MR. ALLEN: -- document that we
22 could reference.

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1 CHAIRMAN ZIEMER: Right. So then
2 the only other outstanding part of issue 1,
3 then, deals with the document that SC&A
4 generated for us to address the discussion we
5 had on the use of assigning the highest
6 deterministic value versus a value from the
7 distribution. I'm trying to remember the
8 exact details on that, but --

9 MR. ALLEN: TBD-6000 applies to
10 distribution. To show that that was
11 favorable, we pointed out the highest dose
12 rate at Fernald --

13 (Simultaneous speaking.)

14 CHAIRMAN ZIEMER: Okay, but you
15 were going to prepare something for us for
16 today.

17 DR. MAURO: We did.

18 CHAIRMAN ZIEMER: And that was --

19 DR. MAURO: Well, the report, in
20 fact, the report that I just re-sent is our
21 evaluation.

22 CHAIRMAN ZIEMER: Oh, that was --

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1 DR. MAURO: That's the -- that was
2 done a while ago, and Bill Thurber is on the
3 line. He was the principal author, and I
4 guess the bottom line is that after carefully
5 looking at the distributions that are in TBD-
6 6000 for external exposure --

7 You know, our original concern was
8 that when those distributions for external
9 exposure were developed in TBD-6000 and the
10 different categories of workers, no mention is
11 made of the Putzier effect.

12 CHAIRMAN ZIEMER: Right.

13 DR. MAURO: And we knew that the
14 Putzier effect occurs on occasion and does
15 result in external exposures that could be on
16 the order of 10 to 15 times higher than, let's
17 just say, regular old uranium metal.

18 CHAIRMAN ZIEMER: Right.

19 DR. MAURO: And we raised that
20 issue, and we had some discussions on that,
21 but subsequent to that, David put together a
22 White Paper which showed that the reality of

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1 the situation is when you look at the actual
2 values that were used in TBD-6000, the medians
3 and the upper 95th percentile values for the
4 different Classes of workers, they are very
5 conservative.

6 And, Bill, you could speak to it,
7 the specifics of it, but I recall even the
8 median value for the machinist had external
9 dose rates which were very high and more than
10 sufficient to capture the fact that maybe
11 there might be a Putzier effect, but if you
12 could speak to that for a minute, I think
13 maybe you could help us out a bit.

14 MR. THURBER: Okay. I think that
15 the way the issue was left last time -- let me
16 back up or remind everybody of what was done.

17 As John said, David looked at the Fernald
18 data, David Allen, and said, "Gee, the Fernald
19 workers obviously were exposed to the Putzier
20 effect."

21 So if I look at this huge data set
22 we, NIOSH, have for Fernald of 120-some

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1 thousand measurements, and I look at the
2 maximum, that guy is obviously going to have
3 experienced any consequences of the Putzier
4 effect, and so that's what NIOSH did.

5 Then the discussion really focused
6 on -- it was kind of statistical, if you will,
7 focusing on whether the Fernald maximum was
8 less than, greater to, or equal to the full
9 distribution from TBD-6000, that is, the
10 median plus the assumed geometric standard
11 deviation of five.

12 It clearly was less than the 95th
13 percentile, but NIOSH indicated that their
14 preferred approach in this case was to use the
15 full distribution, and so at the time it was
16 not absolutely clear where the full
17 distribution sat relative to the Fernald
18 maximum, and we provided some information on
19 that in our paper of December 30, the non-PA
20 cleared version of the White Paper.

21 And subsequently we did a couple
22 more modeling calculations, because if you --

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1 there were some situations where it wasn't
2 clear whether the Fernald maximum or the full
3 distribution from TBD-6000 was limiting, and
4 on the basis of a couple of additional
5 calculations of hypothetical POCs, we
6 convinced our -- and those two cases were in a
7 side memo. They were not part of the White
8 Paper.

9 But, anyway, the bottom line is
10 that we have convinced ourselves that the
11 Fernald max -- that the TBD-6000 full
12 distribution is more conservative than using
13 the Fernald maximum, so we think that is a
14 sound approach.

15 CHAIRMAN ZIEMER: Okay. Thank you.

16 Well, it appears to me, then, that we're
17 ready to close issue 1 with the understanding
18 that the revisions dealing with the Putzier
19 effect would be included in it and that
20 dealing with the specifics of the non-
21 destructive testing for General Steel would be
22 addressed in our handling of Appendix BB and

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1 the related Petition Evaluation.

2 Is that -- Work Group members, are
3 you agreed on that? Mark, do you have a
4 comment?

5 MEMBER GRIFFON: I mean, can you
6 just -- I'm just trying to find the original
7 copy of TBD-6000. Can you remind me what the
8 distribution was based on in TBD-6000 on this?

9 MR. ALLEN: It was a model
10 distribution based on dose rates from
11 different sites.

12 MEMBER GRIFFON: So it was modeled
13 data, not -- so we're not relying on Fernald
14 surrogate. This was just a comparison we
15 were doing.

16 MR. ALLEN: A comparison that
17 basically if we relied on surrogate data from
18 Fernald, it would be lower.

19 MEMBER GRIFFON: Right.

20 MR. ALLEN: The model --

21 CHAIRMAN ZIEMER: The model is more
22 conservative than the Fernald maximum.

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1 MEMBER GRIFFON: Because one thing
2 I get concerned about with that, and Jim will
3 reflect back to last week's meetings, is that
4 I think Fernald is still looking at the
5 question of the data at Fernald.

6 So if you're relying on comparing
7 against the data at Fernald, the Fernald Work
8 Group is still looking at that question of
9 data, you know, validity for the SEC review
10 for Fernald. So, you know --

11 MR. ALLEN: To put some words in
12 John's mouth here, it's his White Paper, they
13 also looked at Mallinckrodt and ElectroMet, or
14 Bill Thurber, I think, did.

15 MR. THURBER: Yes.

16 CHAIRMAN ZIEMER: Not just Fernald
17 data but other data around the site for the
18 same effect. Are you okay with that?

19 MEMBER GRIFFON: And the only other
20 -- yes. The only other question I have is how
21 does this get at the question of hand doses or
22 those kind of issues? I don't know if that's

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1 covered in issue 1.

2 DR. MAURO: Bill, you looked at
3 that.

4 MR. THURBER: Yes. We looked at
5 doses to the hands and arms. We looked at
6 doses to the rest of the skin, and we looked
7 at the whole body doses and did the kind of
8 comparison I talked about where we examined
9 whether the Fernald maximum was more or less
10 conservative than using the TBD-6000 full
11 distribution, and we found that in each case
12 that the TBD-6000 full distribution was more
13 conservative, more claimant-favorable.

14 MEMBER GRIFFON: Okay, but just to
15 go back one step, do you think the -- you said
16 one is more or less conservative than the
17 other. I'm asking the question of whether you
18 think it's a scientifically, you know, robust
19 approach for estimating the dose.

20 You know, taking it back one step
21 to look at the 6000 model, is that dose
22 adequate to reconstruct those extremity doses,

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1 you know? I mean, you said one is a more
2 conservative approach than the other one. I'm
3 not asking that question.

4 I'm asking is the model in TBD-
5 6000 adequate for estimating doses to
6 extremities? Does that make sense? I'm not
7 sure --

8 DR. ALLEN: I'm not sure I
9 understand your point.

10 MEMBER GRIFFON: Well, I'm asking -
11 -

12 DR. MAURO: I'm trying to think of
13 the original source and models and data.

14 MEMBER GRIFFON: And part of it is
15 I'm trying to remember where this came from.

16 DR. MAURO: And I don't remember
17 where --

18 CHAIRMAN ZIEMER: Yes, let me see
19 if I can clarify the question. I think Mark
20 is asking how, as a starting point, how do you
21 determine what the hand and skin doses were
22 based either on source term or film badge

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1 data, I guess, is what you're asking.

2 MEMBER GRIFFON: Yes.

3 CHAIRMAN ZIEMER: Or what --
4 whatever --

5 MEMBER GRIFFON: Yes, I mean, how
6 do you -- I'm trying to -- I brought -- I
7 didn't bring every document I needed.

8 CHAIRMAN ZIEMER: How did you --
9 how did you reconstruct extremity doses?

10 MEMBER GRIFFON: Right. How does --
11 - what's NIOSH's approach for using that
12 distribution of data? I'm assuming that --
13 well, I don't want to assume anything. Did
14 you model the whole body exposure from these
15 various geometries? Is that how you came up
16 with this distribution?

17 MR. ALLEN: We did it for all
18 three. We modeled --

19 MEMBER GRIFFON: Okay.

20 MR. ALLEN: -- whole-body photon,
21 skin of the whole body, and hands and
22 forearms.

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1 MEMBER GRIFFON: Okay. So you have
2 three different distributions.

3 MR. ALLEN: Three different, yes.

4 MEMBER GRIFFON: Okay. Okay. That
5 answers my question. I was trying to
6 remember.

7 CHAIRMAN ZIEMER: We've gone
8 through that in the past, but you were a
9 little fuzzy on it.

10 MEMBER GRIFFON: Yes. Okay, and
11 SC&A is saying you looked at all, each
12 different distribution --

13 DR. MAURO: Yes, we looked at --
14 yes, we did that. What I have to say is that,
15 and I was trying to reach into my memory, is
16 that originally when you did TBD-6000, what
17 was the original data or models that we used,
18 and I know that in some cases --

19 I might be confounding 6001 with
20 6000. Some were models, physics models, and
21 others were data that you looked at a broad
22 range of operating facilities, and I've got to

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1 say I don't quite remember what the -- what
2 the --

3 MR. ALLEN: Well, I'm getting
4 things mixed up, too, John, but if I remember
5 right, 6000 was all model, and 6001 --

6 DR. MAURO: And 6001 was data.

7 MR. ALLEN: -- included some data,
8 yes. Okay.

9 MEMBER GRIFFON: And the last
10 question -- I think I'm -- I'm just trying to
11 refresh my memory before we close something
12 out, but did this include -- all this is
13 modeled for 6000 you're saying.

14 MR. ALLEN: If I remember right.

15 MEMBER GRIFFON: Okay.

16 MR. ALLEN: The vast majority is.
17 I'm pretty sure it's all --

18 MEMBER GRIFFON: Because I'm
19 curious if the -- I mean, the Putzier effect,
20 I vaguely remember some measure data, you
21 know, near these, and I wonder whether that
22 was compared with the modeling exposure rates

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1 and stuff that you had. Was that compared in
2 any way?

3 DR. MAURO: Well, what we compared
4 was the Putzier data, which says 15 times
5 higher.

6 MEMBER GRIFFON: The Putzier data
7 is actually measured data, right?

8 DR. MAURO: Yes, and they measured.

9 MEMBER GRIFFON: Okay.

10 DR. MAURO: They measured numbers.

11 MEMBER GRIFFON: And you're saying
12 --

13 DR. MAURO: And then we looked at
14 their distribution to see whether or not their
15 distribution was claimant-favorable that they
16 used in TBD-6000. Well, that's the question
17 right now is how did you get your
18 distribution? Was it -- how much did it
19 depend on models? How much did it depend on
20 empirical data? And I just don't remember.

21 MEMBER GRIFFON: All right. I'd
22 like to -- maybe at a break we can -- I can

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1 find the document.

2 MEMBER BEACH: Well, isn't that in
3 your White Paper?

4 DR. MAURO: Yes.

5 MEMBER BEACH: I'm looking at page
6 7 of 18 --

7 DR. MAURO: Go ahead.

8 MEMBER BEACH: -- which talks about
9 exposure dose estimation, and it's talking
10 about contact with uranium and the atoms, and
11 I'm wondering if that's the model that you
12 were looking for, Mark.

13 MEMBER GRIFFON: It might be.

14 MEMBER BEACH: On page 7 of 18.

15 CHAIRMAN ZIEMER: Is that on the
16 January --

17 MEMBER BEACH: On the December 30.

18 CHAIRMAN ZIEMER: December.

19 DR. MAURO: Yes, but it should be
20 the description of what is in TBD-6000.

21 CHAIRMAN ZIEMER: Oh, yes.

22 MEMBER BEACH: It's the TBD-6000

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1 approach to exposure dose estimation.

2 DR. MAURO: Yes.

3 MEMBER GRIFFON: Maybe -- I think
4 we're ready to close it out. I'm just not
5 ready to vote. If we could just go over it at
6 the break --

7 CHAIRMAN ZIEMER: Sure.

8 MEMBER GRIFFON: That would be
9 fine. Make sure of what I'm looking at, but,
10 yes, I think it --

11 CHAIRMAN ZIEMER: We can do that.
12 I want to move us along. We're going to --
13 we'll come back after the break.

14 MEMBER BEACH: John's got --

15 MEMBER GRIFFON: One last thing --

16 CHAIRMAN ZIEMER: We're not going
17 to take a break yet, so it's -- another
18 question, Mark?

19 MEMBER GRIFFON: One last question
20 on the Putzier data, I guess. Was that -- did
21 you -- you compared Fernald data to this TBD-
22 6000 part. You didn't necessarily compare

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1 Putzier numbers. You just know that that same
2 effect would have taken place at Fernald,
3 right?

4 DR. MAURO: I just want to back up
5 a little bit.

6 MEMBER GRIFFON: Go ahead.

7 DR. MAURO: The reason TBD-6000 is
8 so high -- you know, how did they -- how come
9 they come up with distributions of doses,
10 annual doses to skin, forearm, whole body that
11 was high enough to capture Putzier effect?
12 Well, the answer was simple.

13 They went with the generic
14 external exposure from naked metal, which is
15 about 200 mR per hour in a foot, but they
16 assumed an enormous occupancy time. In other
17 words, so what happens is the annual dose that
18 you get in TBD-6000 is based on two
19 assumptions, no Putzier effect.

20 Well, what they do is they say,
21 But we're going to say that the person is
22 present close to this metal for a long -- many

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1 hours, 1,000 hours a year, some
2 extraordinarily long period of time, which is
3 very conservative. So what happens is you end
4 up with an annual dose, the hands, forearm,
5 whole body, which captures the fact that
6 you're assuming that exposure.

7 Now, the reality of the situation
8 is people don't spend that much time that
9 close, and even if there was a Putzier effect,
10 it would be accounted for, and that's why it
11 just so happens that even the highest values
12 observed at Fernald were within the reasonable
13 boundaries of TBD-6000, because the reality is
14 that people don't spend that much time.

15 So, in a way, you got lucky. What
16 I mean by that is you ended up using -- end up
17 using --

18 MEMBER GRIFFON: Well, you put a
19 high number on it.

20 DR. MAURO: Well, no. No, no.

21 MEMBER GRIFFON: I'm more concerned
22 about it now than I was before you made those

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1 statements.

2 DR. MAURO: No, no, no, no. Let me
3 say, listen, we don't know the occupancy data.

4 I mean, really, what I'm saying, for better
5 or worse. We see how -- we know how it
6 happened. We know that they started with the
7 physics of the problem.

8 We know what the radiation field
9 is in contact and at a distance from a slab of
10 natural uranium, and we can come up with an
11 annual dose based on -- a distribution based
12 on how much time a person spends close to it,
13 and they adopted some very conservative
14 assumptions to make sure that they were
15 claimant-favorable for the default values for
16 TBD-6000. They were so conservative that they
17 actually enveloped the highest exposures.

18 MEMBER GRIFFON: I was of the
19 impression that they actually modeled the
20 ingots as they would appear with the Putzier
21 effect, but they didn't do that.

22 CHAIRMAN ZIEMER: No, NIOSH told

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1 us. NIOSH told us at the last meeting --

2 MEMBER GRIFFON: You just made a --
3 you put a high number.

4 CHAIRMAN ZIEMER: No, no. They
5 told us at the last meeting that the
6 calculation was not based on the Putzier
7 effect but that it --

8 MEMBER GRIFFON: No, I'm not saying
9 they're contradictory. It's my memory. It's
10 not -- yes.

11 CHAIRMAN ZIEMER: In fact, that's
12 specifically in the transcript from last time
13 that exactly what you said, John, that the --

14 MEMBER GRIFFON: I guess it's the
15 hands, forearm --

16 CHAIRMAN ZIEMER: -- approach used
17 was sufficiently conservative to cover the
18 Putzier effect even if it was present.

19 MR. THURBER: This is Bill Thurber.
20 Just to confirm what John said, what they
21 specifically assumed in TBD-6000, an operator
22 spent half of his time with his hands in

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1 contact --

2 MEMBER GRIFFON: In contact. Okay.

3 MR. THURBER: -- with this large
4 mass of uranium, 50 percent of his time, and
5 that's why it was so conservative.

6 CHAIRMAN ZIEMER: Yes, and I guess
7 the alternative would be to find that more
8 realistic time and then calculate the Putzier.

9 DR. MAURO: And calculate Putzier,
10 right.

11 CHAIRMAN ZIEMER: And you might end
12 up at the same place. In one sense, it was
13 sort of fortuitous that it worked out that
14 way, because the assumptions appear to be
15 unrealistic in terms of reality, in terms of
16 what a worker would actually do.

17 MEMBER GRIFFON: That's something
18 that I'd like to, even in a break, just do a
19 back-of-the-envelope, because I think the dose
20 rates from the Putzier effect are so much
21 higher.

22 DR. MAURO: Fifteen. Fifteen-fold.

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1 MEMBER GRIFFON: Yes.

2 DR. MAURO: In other words --

3 MEMBER GRIFFON: So you can break
4 out the time. I mean, if you're there for an
5 hour handling, it's not -- it's a less
6 conservative approach.

7 DR. MAURO: Well, and it --

8 MEMBER GRIFFON: I'd have to look
9 at the numbers, but just for the extremity
10 doses. I'm not saying for the overall.

11 DR. NETON: It's source-term model,
12 essentially, and apparently we've gone out and
13 validated against real data. I mean, I don't
14 know what more you can do than that. It's
15 bounded. It bounds the real data that's out
16 there. What's the issue here?

17 MEMBER GRIFFON: Well, that's what
18 I'm questioning is whether it --

19 DR. NETON: You just heard him say
20 that. They compared it at Fernald, they
21 compare it to Mallinckrodt. You compare it to
22 other facilities, and it bounds the real world

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1 data.

2 MEMBER GRIFFON: And then you have
3 the question of the Fernald data, but
4 especially extremity data at Fernald. I don't
5 know whether it exists for the extremity doses
6 at Fernald, but maybe it's there.

7 DR. NETON: I can't comment on all
8 data, but --

9 MEMBER GRIFFON: Yes, but, anyway,
10 I would just want to -- you know, you're
11 saying 50 percent of the time -- was it 50
12 percent of the time with hands in contact? I
13 mean it's probably -- yes, it's probably --
14 how does that --

15 This is something I can do at the
16 break with, you know, someone's help on the
17 back of the envelope, the dose rates from the
18 Putzier sort of ingot versus a -- your model
19 just assumes uranium metal, right?

20 MR. ALLEN: Right.

21 MEMBER GRIFFON: So you have dose
22 rates at each. You have residency times with

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1 their hands in contact at each. You know,
2 it's a simple little calculation to see if one
3 is more -- you know, I'm --

4 CHAIRMAN ZIEMER: Well, one -- you
5 know, you can always postulate different times
6 and come up with different numbers, but I
7 think --

8 MEMBER GRIFFON: Well, that's what
9 they just did. They postulated occupancy
10 times.

11 CHAIRMAN ZIEMER: But the bottom
12 line is comparing it with real world data.

13 MEMBER GRIFFON: But I -- yes. I
14 mean, not to be completely cynical about this,
15 but I can look at Fernald data and say, okay,
16 how much occupancy time do I need to put in my
17 model to make it bounding as the Fernald data?
18 I mean, that's a, you know, a very simple
19 thing.

20 Again, I'm not -- I'm going back
21 mainly to the extremity situation. That's the
22 one concern.

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1 CHAIRMAN ZIEMER: John?

2 MEMBER GRIFFON: Because that's
3 what they always bring up with us. That's why
4 the Putzier stuff got brought out in the first
5 place.

6 DR. MAURO: I mean, the highest
7 number we're seeing may be the result of the
8 person who does handle it for long periods of
9 time, but is he wearing gloves, and a lot of
10 the beta was attenuated. I don't know.

11 MEMBER GRIFFON: True. True.
12 That's another factor.

13 CHAIRMAN ZIEMER: Okay. So --

14 MEMBER GRIFFON: I'm close to
15 agreeing, but --

16 DR. MAURO: Bill, it sounded like
17 you wanted to say something.

18 MR. THURBER: Yes, I wanted to
19 clarify one point for everyone. With regard
20 to the extremities dose, Fernald did not
21 measure that, so the Fernald maximum did not
22 involve an extremities dose to the hands and

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1 arms. They did have data to the general
2 surface of the body but not to the hands and
3 arms.

4 What we did to come up with a
5 comparable figure is that we used a
6 multiplier, which we documented the source of
7 in the December White Paper, to come up with
8 what we felt was a reasonable estimate of the
9 exposure to the hands and arms.

10 MEMBER GRIFFON: What do you mean,
11 a multiplier?

12 MR. THURBER: Well, it was a
13 multiplier based on measurements that had been
14 made comparing the measurements from a film
15 badge to the expected dose to other parts of
16 the body.

17 CHAIRMAN ZIEMER: I assume that's a
18 geometric --

19 MEMBER GRIFFON: That's something
20 NIOSH has done before, yes, sort of correcting
21 for different -- anyway --

22 CHAIRMAN ZIEMER: Okay. So we'll

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1 revisit this briefly after the break. I
2 believe on the TBD-6000 Issue Matrix, John,
3 I'm looking at your summary. We skipped to
4 issue 5 was the open one last time.

5 DR. MAURO: Yes.

6 CHAIRMAN ZIEMER: Issue 2 was in
7 abeyance.

8 DR. MAURO: Well, issue 2 is simply
9 a table that they need to put in the report.

10 CHAIRMAN ZIEMER: Right, which will
11 appear in the revision. Issue 3 was closed.
12 Issue 4 was closed or resolved. This is all
13 previous.

14 DR. MAURO: Yes.

15 CHAIRMAN ZIEMER: On Issue 5, we
16 closed that last time.

17 DR. MAURO: Yes.

18 CHAIRMAN ZIEMER: On issue 6, we
19 transferred that to the Procedures Review
20 Subcommittee, and that has been officially
21 transferred, and that is the one, I believe,
22 dealing with the resuspension factors.

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1 DR. MAURO: Yes.

2 CHAIRMAN ZIEMER: And the net
3 result of this is that we're not going to be
4 able to -- well, I guess we'll be able to
5 close TBD-6000, because this will move out of
6 that. This becomes a system-wide factor, not
7 a TBD-6000, so whatever the suspension factor
8 models are that NIOSH will use overall will
9 apply in this case and in other cases.

10 So that's not TBD-6000 specific
11 any longer, and that is being addressed by the
12 Procedures Work Group, and then that, in fact,
13 will close out TBD-6000 if we are able to
14 close this first item, and then we will be in
15 a position to proceed with the revision.

16 DR. ALLEN: Yes. I don't know if
17 it's closed out or held in abeyance, whatever
18 the terminology is.

19 CHAIRMAN ZIEMER: Well --

20 DR. ALLEN: There's some held in
21 abeyance.

22 CHAIRMAN ZIEMER: The abeyance one

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1 was Issue 2, but that simply means once you do
2 that, it's closed. It's in abeyance just to
3 assure ourselves that it gets done.

4 MEMBER BEACH: Well, issue 1 is
5 actually in abeyance, also, according to my
6 notes.

7 CHAIRMAN ZIEMER: Well, in a sense,
8 that's correct, because -- but we still have
9 this other question on --

10 MEMBER BEACH: Right.

11 CHAIRMAN ZIEMER: -- on that model.
12 Yes, it was in abeyance in terms of the
13 revision that was promised, but we have that
14 open question.

15 MEMBER BEACH: Did you mention
16 seven?

17 DR. MAURO: That's the last line
18 you added.

19 MEMBER BEACH: Okay.

20 MEMBER POSTON: We haven't gotten
21 to seven yet.

22 CHAIRMAN ZIEMER: Let's see. I

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1 guess I didn't mention seven. Seven was
2 closed at one point.

3 DR. MAURO: Yes, I'm the trouble-
4 maker on seven, okay. I'll give you the fly
5 in the ointment.

6 CHAIRMAN ZIEMER: I didn't have --
7 did we not discuss that at the last meeting?

8 DR. MAURO: We did. We had quite a
9 bit of discussion, and I left it at one place
10 where -- you see, I think the arguments Jim
11 and John Poston made during the meeting we
12 completely accept regarding the way -- what I
13 call the point two rule that you folks use,
14 point two.

15 Whatever the air concentration is
16 in milligrams per cubic meter, the amount of
17 uranium a person might ingest. You multiply
18 the air concentration in milligrams per cubic
19 meter, 5.2, and then you get milligrams per
20 day ingested, okay.

21 Now, the outcome of that, for all
22 intents and purposes, if it's a fairly high

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1 concentration, like 100 MAC, we're dealing
2 with a fairly high. You're going to get what
3 I, from my experience, from reading the
4 literature, a fairly high ingestion rate, 20
5 milligrams per day.

6 As far as I'm concerned, when
7 you're talking in multiple milligrams per day
8 as being the ingestion rate, that's compatible
9 with the literature that's been published by
10 others, NCRP and EPA. But then I run into --
11 and then, also, so I'm okay there when you're
12 dealing --

13 You end up with a number when
14 you're dealing with very high dust levels, but
15 when you're dealing with very low dust levels,
16 not low-low but, you know, one MAC, all of a
17 sudden you're down to a fraction, a small
18 fraction of a milligram per day as your
19 ingestion rate, and the argument made that
20 that's okay, and I accept this.

21 The reality is in most
22 circumstances, whenever there is soot on the

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1 ground and it's comingled with perhaps some
2 uranium that might be associated with some
3 operations, when you're inadvertently
4 ingesting that material, it's not all uranium.

5 CHAIRMAN ZIEMER: No.

6 DR. MAURO: Only a fraction of it
7 is uranium, and, as a result of that, the fact
8 that you end up with .2 milligrams per day of
9 uranium under those circumstances being
10 ingested, you know, heuristically you say
11 that's fair.

12 But the one place I don't think
13 it's fair, and that's what I mean by the fly
14 in the ointment, is if you've got a site where
15 you have thick layers of pure uranium oxide
16 sitting on surfaces at one of these old AWE
17 facilities where it's not a mixture of steel
18 and soot and junk, it's uranium, I have a
19 problem with the .2 milligrams per day, and in
20 those circumstances I feel that the ICRP and
21 EPA number of 50 milligrams per day makes more
22 sense, and that's where I come out on that.

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1 So, yes, everything is fine except
2 when you've got a site where you know they've
3 happened in the past where you actually could
4 see material, and it's uranium, and it's being
5 kicked around, Simonds Saw, Bethlehem Steel,
6 some of these old mill operations where the
7 accumulation of uranium is apparent on
8 surfaces, and it is uranium.

9 It's not a lot of other soot.
10 Then I feel as if that you can't walk away
11 from the EPA and NCRP 50 to 100 milligram per
12 day number.

13 CHAIRMAN ZIEMER: Okay. Comments?

14 NIOSH?

15 MR. ALLEN: Just a clarification.
16 You're talking about a lot of material laying
17 on the floor being kicked around that's not
18 causing airborne?

19 DR. MAURO: Well, I'm saying that
20 the hand -- the hand-to-mouth action, okay, I
21 have accepted the fact that when there is a
22 lot of material, soot, dirt, you're in a dirty

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1 attic, you're in a dirty workplace.

2 I accept the work done by EPA and
3 NCRP summarizing the literature. They're not
4 talking radioactivity. They're talking soot.

5 How much of this material has been
6 inadvertently ingested? And the number that
7 comes up in those two places is 50 to 100
8 milligrams per day is what's being
9 inadvertently ingested, just through
10 inadvertent hand-to-mouth movement.

11 Now, the argument that you folks
12 are making is, well, it's not like that at a
13 uranium plant where all the material that's
14 involved in hand-to-mouth transfer is all
15 uranium. It's mostly just other soot, and a
16 little bit of uranium might be mixed in, and
17 under those circumstances I can see why you
18 would not be very comfortable using such a
19 large number as 50 milligrams per day.

20 But there are circumstances at
21 sites where we've read where there was a lot
22 of accumulated uranium on surfaces where just

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1 about 100 percent of the material that was
2 sitting on surfaces, it was, in fact, uranium,
3 and in those circumstances I don't think you
4 get this dilution effect, and all of a sudden,
5 the 50 to 100 milligrams per day seems to be
6 more claimant-favorable and appropriate to be
7 used.

8 MEMBER POSTON: John, I hate to
9 interrupt you, but --

10 DR. MAURO: Yes.

11 MEMBER POSTON: -- two questions
12 real quick. Give me an example of repetitive
13 hand-to-mouth that you would expect in a
14 uranium -- I mean, what are you talking about?

15 DR. MAURO: Well, apparently, you
16 know, when a person is -- when you look into
17 the literature on this -- Scott Calabrese
18 wrote some work and a lot of people -- it is
19 not unusual for various reasons, whether
20 they're smoking, they're eating, or just
21 habitual movement, you pick your hand, you put
22 it to your mouth, and you take in small

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1 amounts.

2 Now, you know, we're talking
3 milligrams, so it's not a -- it's not a lot of
4 mass, but the data show there are some -- Jim,
5 you made some very good points about, well,
6 there are some aspects of that data that
7 you're not too comfortable with, but at the
8 same time, I find it hard to walk away from
9 what the EPA and NCRP says.

10 MEMBER POSTON: Most of the
11 facilities that I've ever been in don't allow
12 eating, so, now, you could postulate that
13 people were unsanitary and went into the clean
14 area to eat their lunch and didn't wash their
15 hands and so forth, but I'm not aware of any
16 kind of hand-to-mouth kinds of stuff that
17 you're talking about. Secondly, I'd like to
18 know -- remind me what NCRP document you're
19 talking about.

20 DR. MAURO: Oh, the number?

21 MEMBER POSTON: Yes.

22 DR. MAURO: It might be -- it might

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1 be 123. I'm not sure.

2 MEMBER POSTON: You don't know.

3 DR. ANIGSTEIN: The EPA exposure
4 factor 10 book.

5 MEMBER POSTON: I'm not asking
6 about that.

7 DR. MAURO: I think it's NCRP 123,
8 where it had the generic models. They have a
9 bunch of generic models on how to model
10 pathways. I believe it's 123, where they talk
11 about inadvertent ingestion as what is your
12 default value for if you want to model the
13 ingestion. I know I'm taking a shot at it.

14 MEMBER BEACH: To make a comment on
15 John's comment, in the early days, even as
16 close as the late eighties, we were smoking,
17 drinking back in the -- back in the zone, so -
18 -

19 MEMBER POSTON: You were in
20 violation of the rules, then.

21 MEMBER BEACH: Actually --

22 MEMBER POSTON: I've been working

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1 since `57, and we --

2 MEMBER BEACH: Well, I'm saying it
3 was practiced.

4 MEMBER POSTON: We always had no,
5 you know, rules against smoking and eating and
6 drinking, and you had to leave the areas. In
7 some cases, you had to wash.

8 MEMBER BEACH: Whether, it was a
9 violation or not, it was being done.

10 CHAIRMAN ZIEMER: Only in areas
11 that were non-decontaminated or just
12 restricted areas?

13 MEMBER BEACH: You would go from a
14 contaminated area right into a control room
15 and smoke, drink, do whatever.

16 DR. ANIGSTEIN: Also, at GSI, the
17 workers testified that they ate their lunch
18 right there. They only had 20 minutes for
19 lunch. They ate their lunch right in the
20 betatron room sometimes, which is where
21 uranium was also handled.

22 CHAIRMAN ZIEMER: Yes, but I think

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1 John is talking about places where they're
2 machining uranium.

3 DR. MAURO: Yes.

4 CHAIRMAN ZIEMER: And, I mean, GSI
5 is not a place that would have machined
6 uranium. It's not a GSI issue.

7 DR. MAURO: Exactly.

8 CHAIRMAN ZIEMER: It's an issue of
9 TBD-6000 and places that would be machining or
10 extruding --

11 DR. MAURO: Which goes way back.
12 It goes back to the fifties.

13 DR. NETON: NIOSH doesn't dispute
14 ingestion occurring in the workplace. We can
15 just say, you know --

16 CHAIRMAN ZIEMER: Right. It's more
17 -- it gets down to the extent to which you
18 would have the pure uranium in big layers
19 versus --

20 DR. MAURO: Right. Exactly.

21 CHAIRMAN ZIEMER: And that, in a
22 sense, could only occur if uranium is the only

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1 thing they're machining so that you had, you
2 know, they're machining no other metals to
3 dilute that, so it's machining only uranium,
4 and I guess we'd be talking -- it probably is
5 uranium oxide.

6 DR. MAURO: That's what ends up on
7 the floor. That's what ends up on the floor.

8 DR. NETON: I understand John's
9 issue here.

10 CHAIRMAN ZIEMER: So the extent to
11 which whatever is there is pure, and I guess
12 you could hypothesize if they're handling a
13 lot of uranium it would be a pretty high
14 percentage, maybe, and the extent to which in
15 a place that's known to be contaminated to
16 that extent, in fact, would they -- I don't
17 know. It's a --

18 DR. MAURO: My world in the last
19 two years has been AWEs.

20 CHAIRMAN ZIEMER: Yes, Jim?

21 DR. MAURO: I'm sorry.

22 DR. NETON: I was just going to say

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1 it seems to me that your argument is that, you
2 know, you can generate this blanket, if you
3 want to call it that, of uranium on the ground
4 that is fairly highly concentrated or
5 contaminated, but it also seems to me that in
6 those situations you would have airborne
7 generation of a fairly high magnitude
8 concentration. If you get that kind of
9 contamination on the ground --

10 DR. MAURO: Yes.

11 DR. NETON: -- you need to generate
12 a fairly high airborne.

13 DR. MAURO: I did all that.

14 DR. NETON: And I think you said at
15 the very beginning you had no problem with the
16 high airborne, assigning that ingestion.

17 DR. MAURO: Yes.

18 DR. NETON: So I'm not sure that
19 this -- you know, the only real --

20 DR. MAURO: In practice, you're
21 saying it may not happen.

22 DR. NETON: In practice, can you

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1 have these giant universally contaminated
2 blankets of uranium on the ground when you
3 have a very low airborne concentration?

4 DR. MAURO: That's true.

5 DR. NETON: I would suggest that
6 you can't.

7 DR. MAURO: That's a good point.

8 DR. NETON: I mean, so --

9 DR. MAURO: So it becomes a moot
10 point.

11 DR. NETON: So it almost sort of
12 cancels out, you know. This little blanket
13 that lies on the ground is what's available
14 for immediately ingesting.

15 DR. MAURO: And if the blanket's
16 there, you've got to have 100 MAC. If you've
17 got 100 MAC, it's 20 milligrams per day.

18 DR. NETON: Exactly. I think it's
19 sort of a self-correcting problem.

20 DR. ANIGSTEIN: My problem with
21 this is that the two are not necessarily
22 related. We're assuming a one-to-one

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1 relationship, assuming that there is a linear
2 relationship between the air concentration and
3 the amount of stuff on the ground, and --

4 CHAIRMAN ZIEMER: I'm not sure we
5 have.

6 (Simultaneous speaking.)

7 DR. ANIGSTEIN: But the model,
8 that's what the NIOSH model does. It takes
9 the air concentration. It multiplies it by a
10 factor, and that's your ingestion rate, and
11 the ingestion is not purely from the air, so
12 the two are separate issues.

13 You can have stuff on the ground
14 without having a high air concentration, and
15 you can presume -- well, the other way around
16 -- I'm sure you could have.

17 So scientifically it's just not a
18 valid connection. It may fortuitously work
19 out sometimes. Well, yes, sometimes. Often,
20 it's right, but --

21 DR. NETON: Well, we value the
22 data. There is a graph that we've shown you

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1 that shows an approximate linear
2 concentration, and it makes some sense.

3 Intuitively, the higher the
4 airborne you generate, the greater the surface
5 contamination would be on the ground. That's
6 the primary mechanism for contaminating a
7 widespread area. I think that's --

8 DR. MAURO: That was another issue
9 that we discussed that we made a complete
10 reversal. We agreed with your --

11 DR. NETON: And we're not
12 suggesting -- we're not -- if we had surface
13 contamination information, we would certainly
14 use it. I mean, this would not -- this is an
15 approach to be used when you have nothing, but
16 we demonstrated, at least empirically, that it
17 seems to hold in -- at least in limited
18 numbers.

19 And, again, it all started with us
20 not accepting that fact that a person could
21 ingest 100 milligrams of uranium if you have
22 almost zero air concentration, and that was

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1 SC&A's original starting point. I think we've
2 come around on that.

3 DR. MAURO: I think so, too. I'm
4 not -- I guess, for whatever it's worth, are
5 there circumstances where you could have heavy
6 contamination of uranium oxide on surfaces,
7 not very heavy dust loadings on the --

8 One hundred MAC -- 100 MAC's a lot
9 of dust. In fact, that's about as high as you
10 could get. If you have circumstances like
11 that, I would use the 50 milligrams per day.
12 I wouldn't go with .2 times the air
13 concentration.

14 Let's say -- let's say the
15 situation was we've got one MAC in the air,
16 but you also note from talking to workers or
17 whatever that, yes, there was a lot of
18 activity on the surfaces. You know, it was
19 there, and then I say to myself, what do I do
20 now? I would use the one MAC for my
21 inhalation, but I would use 50 milligrams per
22 day for my ingestion.

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1 MR. ALLEN: Yes, it's the same
2 argument. Basically, you're saying there's
3 got to be a place that works almost entirely
4 with uranium.

5 DR. MAURO: Yes.

6 MR. ALLEN: You get a high
7 concentration of uranium.

8 DR. MAURO: Absolutely. It would
9 be --

10 MR. ALLEN: Housekeeping is so bad,
11 you get a thick layer on the ground, but
12 somehow with that situation you get no
13 airborne. That's the --

14 DR. NETON: That's the issue, and
15 I'd be totally willing to put in some provisos
16 in this document that says one needs to
17 evaluate for certain circumstances --

18 DR. MAURO: Be cautious.

19 DR. NETON: In many cases, I think
20 many of the AWEs were very short duration
21 projects. These were not like -- Simonds Saw
22 was a long duration production operation, and

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1 we actually had surface contamination.

2 DR. MAURO: And you did have 100
3 MAC.

4 DR. NETON: Yes, we had 100 MAC,
5 and Bethlehem Steel we had surface
6 contamination measurements, but these small
7 Atomic Weapons Employers that did a small
8 amount of work, a short duration, I think the
9 model is fairly reasonable.

10 DR. MAURO: I think, perhaps, in
11 practice I would agree with you. How many
12 times are you going to run into this? I have
13 to say that I am sort of stuck. You know, my
14 world, I was so used to working with this 100
15 and this 50 milligram per day number for all
16 my dose calculations.

17 It goes back 30 years, and now all
18 of a sudden to walk into .2 micrograms per day
19 as being ingestion, it just rubs me the wrong
20 way, and I'm looking for a place where we
21 could compromise and say what's reasonable
22 within the milieu that we're working in.

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1 And it seems to me that if a
2 circumstance of the type I just described
3 comes up, I think we have -- the right thing
4 to do is we go with that high ingestion rate,
5 but that circumstance may not arise. I don't
6 know.

7 MEMBER MUNN: It's just difficult.

8 It's just difficult to assume circumstances
9 where there is a high surface concentration,
10 but the level of physical activity in the area
11 is so low that your air concentration is low.

12 CHAIRMAN ZIEMER: Well, you're
13 thinking about resuspension, but to get the
14 surface concentration to start with, you have
15 to have generated an aerosol that's going to
16 settle down.

17 MEMBER MUNN: Yes, that's true.

18 CHAIRMAN ZIEMER: I think that's
19 what Jim is talking about is that --

20 MEMBER MUNN: Yes, he's --

21 CHAIRMAN ZIEMER: So there's an
22 aerosol to start with, and you would have

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1 ingestion from that, because we're assuming no
2 protection --

3 MEMBER MUNN: No.

4 CHAIRMAN ZIEMER: -- anyway, to
5 start with in a situation where there is
6 obviously almost visible dust.

7 DR. NETON: Right. Right.

8 MEMBER MUNN: When that's not the
9 case, when that's -- when you have a low air
10 concentration, then how could you --

11 CHAIRMAN ZIEMER: Well, Jim, you're
12 talking here or suggesting a caveat that would
13 address unusual situations where if it became
14 clear that you had a situation such as John
15 described that you would do something. I'm
16 not sure what it is you would do. I mean, you
17 don't even know that. You're only using this
18 as a default when you don't have either urine
19 samples or air samples or something.

20 DR. MAURO: Right.

21 CHAIRMAN ZIEMER: So it's a
22 default, so how do you even know you have this

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1 situation to start with, the one you
2 described?

3 DR. NETON: Interviews from
4 workers, possibly. I don't know.

5 CHAIRMAN ZIEMER: But workers don't
6 necessarily -- and if there is no rad
7 protection program, who knows what those
8 concentrations were? I mean, the fact that
9 things are coated, unless you have source
10 terms that say, you know, they only work with
11 uranium and so on, and so therefore we're
12 going to assume that it's as you described.

13 It's pure -- you know, workers
14 describe that everything is coated with this
15 stuff, and you say, oh, by the way, the only
16 thing they were machining was uranium. So we
17 have this situation. Now what do we do?

18 MEMBER BEACH: Do we have any
19 examples of facilities that we would have it
20 occur?

21 DR. NETON: In our approach, I
22 think we would assume or try to estimate some

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1 level of surface contamination as existed,
2 whether it's 100,000 --

3 CHAIRMAN ZIEMER: That would give
4 that.

5 DR. NETON: It would give you --

6 CHAIRMAN ZIEMER: And you could
7 calculate an intake.

8 DR. NETON: And we're sort of at a
9 disagreement between how many square meters of
10 surface a person ingests per hour or per day.

11 I mean, there are EPA models, and the EPA
12 model that we've adopted uses a smaller
13 surface area of aerial ingestion than I think
14 what SC&A was reporting.

15 DR. MAURO: Yes, there were two.

16 DR. NETON: There's two.

17 DR. MAURO: One is the low. One is
18 the high.

19 DR. NETON: One's low, and one's
20 high.

21 DR. MAURO: That was Charlie Yu's
22 work.

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1 DR. NETON: Yes. How much -- it
2 essentially comes down to how much surface
3 contamination is there and how much of that
4 surface contamination does one ingest per hour
5 or per unit time. Those are the two, only two
6 values you really need.

7 CHAIRMAN ZIEMER: And their
8 assumptions on the ingestion, you're talking
9 about oral.

10 DR. MAURO: Oral, yes. You just
11 have to swallow a part. You know, it was
12 brought up, and so this person --

13 CHAIRMAN ZIEMER: Yes, and why are
14 those -- why are there those two
15 discrepancies, I mean, or do they assume like
16 -- is it like heavy work and light work, or is
17 it like smokers and non-smokers?

18 DR. MAURO: That's the way -- I
19 remember Charlie Yu has a little writeup in
20 one of the -- one of the documents he wrote
21 for the NRC, and he decided to break the world
22 into two categories, one where the things are

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1 relatively clean and the amount of inadvertent
2 ingestion would be relatively small and other
3 places where things could be pretty bad, and
4 the point, the low number that you use you
5 went with that distribution.

6 DR. NETON: Well, I wouldn't
7 characterize it that way. I think he came up
8 with some intake estimates that appeared to
9 him to be fairly implausible given the larger
10 surface area ingestion. We can go revisit
11 that.

12 MEMBER GRIFFON: I think it sounds
13 like --

14 DR. NETON: We're getting into the
15 weeds here on this, but I'd like to point out,
16 though, this is not -- this is -- this is a
17 TIB-0009 issue. This is not a TBA-6000 issue.

18 DR. MAURO: That's true, too.
19 That's true, too. This is TIB-0009.

20 DR. NETON: I mean, so this is
21 outside the scope of this.

22 DR. MAURO: If you want to -- if

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1 you want punt this to TIB-0009 --

2 DR. NETON: It's in TIB-0009. I
3 mean, this is --

4 MEMBER GRIFFON: It's still an
5 ongoing decision there.

6 CHAIRMAN ZIEMER: This is being
7 covered in TIB-0009?

8 DR. MAURO: Absolutely.

9 DR. NETON: This is the TIB-0009
10 approach.

11 DR. MAURO: This is TIB-0009.

12 MR. ALLEN: And TBD-6000 just says
13 to use TIB-0009.

14 (Simultaneous speaking.)

15 DR. MAURO: To use TIB-0009. Why
16 didn't you tell me that a half hour ago?

17 CHAIRMAN ZIEMER: I'm thinking
18 that, actually, we discovered that before, and
19 that may be why we didn't have it. Do we need
20 to officially transfer this to TIB-0009, I
21 mean, to --

22 DR. MAURO: Procedures.

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1 CHAIRMAN ZIEMER: Procedures? If
2 it's being covered there, anyway --

3 DR. NETON: It's already there.

4 MEMBER POSTON: Hey, John, 123 is
5 not appropriate.

6 CHAIRMAN ZIEMER: Well, this matter
7 of keeping it open --

8 MEMBER POSTON: No, it's the right
9 one. It's not appropriate, though. 123 is
10 models. It's screening models for releases to
11 the environment.

12 DR. MAURO: It is environment, oh,
13 yes. Yes, it's not --

14 MEMBER POSTON: -- inadvertent
15 workplace. These are just -- these are just
16 rough estimates of --

17 DR. MAURO: Oh, yes.

18 MEMBER POSTON: -- screening models
19 or yes, go or no go kinds of constructions.

20 DR. MAURO: Yes.

21 MEMBER POSTON: So I'm not sure
22 that what you're --

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1 DR. MAURO: Is that -- yes, and
2 they come up with --

3 MEMBER POSTON: I'm not sure that's
4 appropriate. I don't know that you can --

5 DR. MAURO: Well, it's an
6 inadvertent ingestion.

7 MEMBER POSTON: I don't think 123
8 is appropriate for what you're doing.

9 DR. MAURO: Okay.

10 CHAIRMAN ZIEMER: Well, in any
11 event, if this is a TIB-0009 issue -- then I
12 believe that we're going to show this as being
13 connected to the TIB-0009 or transferred to
14 Procedures and not a TBD-6000 only issue.
15 Bob, you have a --

16 DR. ANIGSTEIN: The reason -- the
17 reason we brought it up and the others -- John
18 brought it up. I brought it up in here.
19 We're working together, obviously.

20 The thing is, this was brought up
21 in connection with TIB-0009, I think, five
22 years ago. We made that original comment

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1 about TIB-0009. I believe I was involved in
2 that.

3 So we were simply making a little
4 nudge that you're never going to just -- never
5 going to resolve, and it keeps coming up in
6 every -- in many Site Profiles such as this
7 one, so it could remain -- how long can it
8 remain in abeyance?

9 CHAIRMAN ZIEMER: It won't remain
10 in abeyance here. We would -- it's not a TBD-
11 6000 issue. It's moved out of our
12 jurisdiction.

13 DR. NETON: At one point -- at one
14 point, it was closed. It was closed at one
15 point, and then SC&A --

16 DR. MAURO: Well, I've got to --

17 DR. NETON: -- reneged on that, and
18 it came back.

19 DR. MAURO: You sold me. You sold
20 me on the 100 MAC, and I came up with 20. I
21 said, "I'm all right," but then I said, "But,
22 wait a minute. It's very rarely" --

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1 DR. NETON: But then we got it down
2 to this what are you really ingesting, the
3 percentage of material, and I agree it's --

4 CHAIRMAN ZIEMER: Yes, but the
5 point is, though, that technically if it's a
6 TBD -- a TIB-0009 issue, we can't really close
7 it, anyway.

8 DR. NETON: I agree. SC&A came in
9 with their little 10 microgram vial.
10 But I suggested that that half microgram was
11 distributed in 100 milligrams.

12 DR. MAURO: And that's -- and we
13 were okay with that.

14 CHAIRMAN ZIEMER: Mark?

15 MEMBER GRIFFON: Just one more
16 thing. I think this is relevant to the 6000
17 discussion. How much -- you said this would
18 only be used if you didn't have data. How
19 many of these facilities are covered in TIB-
20 6000? Do you have any sense of how often
21 those models -- is it 50 percent of the time?
22 Is it --

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1 MR. ALLEN: I want to say quite a
2 bit for the 6000.

3 MEMBER GRIFFON: Yes. So you're
4 saying it's only going to be used for --

5 (Simultaneous speaking.)

6 MEMBER GRIFFON: That means all the
7 ones in TIB-6000, doesn't it, or almost all of
8 them?

9 DR. NETON: If we had data, it
10 wouldn't be there.

11 MEMBER GRIFFON: Okay. Okay. I
12 just wanted to clarify that.

13 (Simultaneous speaking.)

14 MEMBER GRIFFON: You don't have
15 this data. The data is not there. That's why
16 you have 6000. Okay.

17 CHAIRMAN ZIEMER: Any other
18 comments on this? That would complete our
19 items on TBD-6000 until we talk about it after
20 the break in terms of Mark's concern on issue
21 1. Maybe this would be a good time to go
22 ahead and take a break. It's 10:00. Let's

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1 take a 15-minute break. Then we'll resume.

2 MR. KATZ: Okay. I'm just putting
3 the phone on mute for 15 minutes for the
4 break.

5 (Whereupon, the above-entitled
6 matter went off the record at 10:00 a.m. and
7 resumed at 10:17 a.m.)

8 MR. KATZ: Okay, this is the TBD-
9 6000 Work Group. We are just reconvening
10 after a short break, and let me check. Henry,
11 do we still have you with us? How about the
12 petitioners, Dan and --

13 CHAIRMAN ZIEMER: John is the site
14 expert.

15 DR. MCKEEL: This is Dan McKeel.

16 MR. RAMSPOTT: This is John
17 Ramspott. I'm here.

18 MR. KATZ: Okay. Thank you.

19 CHAIRMAN ZIEMER: Thank you. Okay.
20 We'll proceed. During the break, Mark
21 Griffon had a chance to review some of the
22 numbers that he was concerned about which

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1 dealt with the extremity exposures from the
2 Putzier effect, and, Mark, do you want to sort
3 of summarize your observations and conclusions
4 on that after having considered the numbers
5 and discussed this some with Dave Allen, as
6 well?

7 MEMBER GRIFFON: Yes. I guess the
8 main thing I was looking at, just to refresh
9 everybody, is the situation of the extremity,
10 the hand or forearm. There's -- and the model
11 as it is currently laid out, I believe,
12 assumes -- well, I don't know if it's the
13 distribution, but -- oh, it is the
14 distribution. Okay.

15 I was going to say the contact
16 they're talking about from uranium metal is
17 like 230 mR per hour, so we were just looking
18 at some back-of-the-envelope sort of
19 calculations, 230 mR per hour. It assumes
20 you're there for four hours, and I was saying
21 with the Putzier effect you've got doses up to
22 2 to 3 R per hour.

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1 So if you back-calculate how long
2 would you have to be there, assuming the
3 "real" numbers, it would be less than a half-
4 hour, maybe, in contact or 20 minutes, 15
5 minutes, depending on the -- I think there's a
6 range of numbers that Putzier provided, but
7 the high numbers were 2 to 3,000 mR per hour.

8 So, you know, and Dave and I had a
9 little discussion on that. I mean, the only
10 place this really comes into play -- because I
11 think the other models are reasonable. The
12 assumptions, the conservatism built into them
13 are reasonable.

14 All I would say is would it be
15 possible to put some sort of caveat in the
16 TBD-6000 saying for the dose reconstructor to,
17 you know, if the assessment of a skin cancer
18 on the hands or forearms comes up and is not
19 compensable --

20 You know, like you said, these
21 doses are already pretty high. They may be
22 compensable cases with the existing model.

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1 Then, you know, a footnote, the dose
2 reconstructor may consider using this, you
3 know, data from the Putzier or adjusting the
4 model by a factor of X, and maybe you can --

5 You know, it's just a thought that
6 maybe the current approach could be modified.
7 It would be for a very small slice of cases
8 that you'd be dealing with, but it would
9 address my, you know, little technical concern
10 here.

11 MR. ALLEN: Actually, for TBD-6000
12 altogether, it essentially, like we've said
13 all along, you know, it's defaults, and there
14 is some language in the early part of that
15 document that says, you know, specific
16 information can be used to adjust a claim,
17 essentially, or a site.

18 I know we have done that when we
19 had, you know, some specific information on a
20 particular claimant. I've got to add language
21 on the Putzier effect, and I could reiterate
22 something like that if we have some specific

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1 information.

2 MEMBER GRIFFON: Yes, I think that
3 would address my concerns.

4 MR. ALLEN: Just a caution, you
5 know, like I was saying.

6 MEMBER GRIFFON: Right.

7 MR. ALLEN: Often, we don't have
8 specific information. I mean, that's kind of
9 what TBD-6000 is about, so it's -- I'm not
10 sure when that would apply, but, you know, I
11 can leave the door open.

12 MEMBER GRIFFON: At least leave it
13 -- yes, I think that would address my
14 concerns, and even if you specify for, you
15 know, for --

16 CHAIRMAN ZIEMER: I think it's only
17 an issue, I believe, for the extremity
18 situation where you're postulating the hands
19 and maybe forearms are in close contact for
20 some extended period, which is relatively
21 short compared to the original model's
22 assumptions. Maybe it's as short as a half an

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1 hour or something.

2 This is somewhat analogous to
3 having the two models that we have in the
4 situation where you look at them both and take
5 the one that gives the higher dose or the
6 higher Probability of Causation.

7 I suppose it's analogous to that,
8 but it sounds to me like this is a little less
9 -- has a little less specificity in terms of
10 it doesn't direct the dose reconstructor to
11 specifically use an alternate model so much as
12 to say that you might consider whether or not
13 the Putzier effect would change things, and he
14 would have to have enough information to make
15 some different assumptions and adjust his
16 calculation accordingly.

17 MR. ALLEN: In all honesty, Mark,
18 I'm not sure exactly how I would word that or
19 whatever.

20 MEMBER GRIFFON: Right. I'm
21 thinking about this --

22 MR. ALLEN: I can leave the door

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1 open.

2 MEMBER GRIFFON: -- is going to
3 say, "Well, what factors should I adjust it
4 by?"

5 CHAIRMAN ZIEMER: Yes, that's what
6 your understanding of --

7 MEMBER GRIFFON: -- accounted for
8 this.

9 CHAIRMAN ZIEMER: Yes. If it's too
10 vague, it recognizes that possibility without
11 giving the dose reconstructor --

12 MEMBER GRIFFON: Any recourse.

13 CHAIRMAN ZIEMER: -- any guidance
14 as to exactly what is supposed to be done.
15 That would be concern I would have, so what
16 I'm wondering is if -- and I don't want to
17 delay the revision if possible, but maybe I
18 could ask both of you to think about what the
19 wording might be that would be helpful to a
20 dose reconstructor.

21 For example, if we had a -- if we
22 had a situation based on what we know about --

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1 and we're talking here generically, not about,
2 for example, General Steel particularly, but
3 in general what do we need to know?

4 We need to know something about
5 handling in the particular case in question,
6 right, handling time? So you need some
7 evidence that things were handled.

8 MEMBER GRIFFON: I guess I would
9 argue that you just need to know the type of -
10 - you know, if it's a skin cancer on the hands
11 or forearm.

12 DR. NETON: That would be sort of a
13 default, then.

14 MEMBER GRIFFON: Yes.

15 DR. MAURO: Yes, but it's for
16 Putzier now.

17 DR. NETON: That's what I just
18 said.

19 DR. MAURO: That's a very specific
20 set of circumstances has to occur for you to
21 have a Putzier.

22 DR. NETON: You have to identify

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1 that a uranium metal could have been there.

2 DR. MAURO: Yes, specially cast.

3 CHAIRMAN ZIEMER: Right, but what
4 is done in that case? That's what I'm saying.

5 What do we tell the dose reconstructor to do,
6 because the calculation presumably has been
7 made based on the model?

8 He's found it's not compensable,
9 and now it says in that case, forearm cancer,
10 and you know that Putzier effect is in play.
11 What do we do?

12 DR. NETON: I'm trying to think of
13 the different scenarios that occur in the
14 AWEs. It would have to be recast metal.

15 MEMBER GRIFFON: You'd have to
16 identify certain sites where it could have
17 been a factor.

18 DR. MAURO: Putzier is such an
19 unusual --

20 CHAIRMAN ZIEMER: One at a time.

21 DR. MAURO: Okay, if you go through
22 your -- make your bomb. You do your

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1 reduction. You generate uranium. Now it's --
2 there is -- you have -- that's clean now. You
3 don't have any thorium-234.

4 Okay, now, okay, it sits for three
5 or four months, okay. The thorium-234 grows
6 back in again. Then you recast it, because
7 you want to get it into another form, another
8 mold. Now, the thorium-234 is there.

9 Now, under those circumstances,
10 when you recast it, then you get a very real
11 possibility of the thorium-234 that had grown
12 in over that time period finding its way to
13 the outside, and then it's out there,
14 enriched, if that's the right word.

15 For a period of time, though,
16 that's limited by its, what, 28-day half-life.

17 DR. ANIGSTEIN: Twenty-four.

18 DR. MAURO: Twenty-four day half-
19 life, so there is this window. That's the set
20 of circumstances that has to occur, and, you
21 know --

22 DR. ANIGSTEIN: But it's not -- it

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1 doesn't have to be that extreme. That's for
2 the extreme. Any time that you have casting
3 of uranium, unless it was refined the day
4 before, but, I mean, with a 24-day half-life,
5 even if it's 24 days, you're going to hit 50
6 percent in growth.

7 So, as long as there is a delay
8 prior to the casting comparable to the half-
9 life, and as long as there is not a great
10 delay after the casting, because, by the same
11 token, if it's cast and it sits in a warehouse
12 for three months, all the external thorium
13 will have decayed. The normal thorium would
14 have grown in, and now you will have a
15 uniform, the usual uniform concentration.

16 So the point which I am --

17 CHAIRMAN ZIEMER: Well, we all
18 understand that. The issue is what are we
19 telling the dose reconstructor to do in the
20 absence of very clear information?
21 Presumably, we don't have the actual -- you
22 know, this would be a case where they didn't

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1 have extremity dosimeters, for example.

2 DR. NETON: Well, this would only
3 be the case with these freshly made derbies or
4 ingots, right? I mean, once you start
5 extruding them into rods or bars or whatever,
6 that stuff goes away, and isn't that the
7 majority of the AWEs where they did like
8 bending, grinding, machining operations on
9 finished product, not the original cast
10 ingots?

11 MEMBER GRIFFON: Some of those
12 maybe only apply to few sites.

13 DR. ANIGSTEIN: Even in the --
14 Bill, are you on the line, Bill Thurber? I
15 guess not. I don't know whether, when you
16 have the -- you have your ingot with the
17 thorium on the surface. Now, if you start
18 rolling it, I would imagine some of the
19 thorium will still stay on the surface.

20 So just because you change the
21 shape doesn't mean that it's gone away. I
22 don't know. That's why I was -- our

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1 metallurgist is no longer with us at the
2 moment.

3 MR. THURBER: Well, some of it --

4 DR. ANIGSTEIN: Oh, there he is.

5 MR. THURBER: Some of it probably
6 scales off, too. It depends, you know,
7 obviously, on how effective your salt bath is
8 or whatever to maintain the oxide that forms
9 on the surface, but some of it's probably
10 going to come off.

11 DR. MAURO: It was my understanding
12 that you don't want this stuff.

13 MR. THURBER: No. Well, one --

14 DR. ANIGSTEIN: Not necessarily all
15 of it.

16 MR. THURBER: A point I don't quite
17 understand is this. The dose reconstructor is
18 going to use the full distribution, which
19 includes this large geometric standard
20 deviation of five, and so I don't quite
21 understand why when he's doing that he's not
22 accounting for the fact that the surface

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1 concentration may be higher than the median.

2 CHAIRMAN ZIEMER: I think Mark's --

3 MEMBER GRIFFON: I don't have the
4 distribution in front of me, but I don't know
5 what the median is, even.

6 MR. THURBER: Well, in our -- in
7 our White Paper, we showed that the 95th
8 percentile value from TBD-6000 dose to the
9 hands and arms was 3,250 rem, and we did --

10 In this same comparison table we
11 did a simple-minded calculation, basically,
12 where we took the 230 millirem per hour
13 number, multiplied it by a factor of 15 to
14 compensate for the thorium 234 concentration
15 on the surface, and assumed an exposure of
16 1,000 hours per year, and that comes out to be
17 essentially the same number.

18 So, when you -- and we said that's
19 kind of a theoretical maximum, if you will, so
20 the theoretical maximum by this back-of-the-
21 envelope calculation, if you will, in the 95th
22 percentile from the TBD-6000 distribution were

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1 basically the same. So, as I say, I'm not
2 clear why, given those kind of numbers, that
3 this problem is not embraced within what the
4 dose reconstructor would normally do.

5 MEMBER GRIFFON: That might -- you
6 might have just answered my question. I
7 didn't know -- I didn't have the distribution
8 in front of me. I mean, the only -- then, the
9 only caveat I'd ask NIOSH to consider is maybe
10 it makes sense to use the 95th for hand and
11 forearm dose instead of --

12 But it sounds like even the full
13 distribution, he's saying, comparing it to the
14 same kind of back-of-the-envelope calculations
15 we did is bounding, so if that's the case,
16 that would answer my concerns.

17 I guess that's the only thing I
18 would leave open is maybe that's the -- I'm
19 trying to pull this up while we're talking,
20 but maybe that's the caveat is that instead of
21 using the full distribution for hand and
22 forearm cases, they could consider the 95th,

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1 you know, the maximum instead of applying the
2 full distribution.

3 CHAIRMAN ZIEMER: Mark, you --

4 MEMBER GRIFFON: It would only be
5 for these specified sites, too. You don't
6 have to -- it wouldn't be all sites, maybe,
7 because even if you're at a rolling -- even if
8 what you said, Bob, is true, that it doesn't
9 change, the characteristic, it's still there,
10 but you're not going to be in direct contact
11 as much in a rolling operation, I would
12 assume.

13 DR. NETON: I would hope not.

14 MEMBER GRIFFON: Yes, I would hope
15 not.

16 CHAIRMAN ZIEMER: Well, you're
17 talking about using the specific 95th
18 percentile value, rather than a distribution?

19 MEMBER GRIFFON: I'm just asking if
20 they can examine that possibility for this
21 hand and forearm --

22 CHAIRMAN ZIEMER: Does that --

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1 MEMBER MUNN: Oh, we didn't cover
2 that?

3 CHAIRMAN ZIEMER: That doesn't --

4 MR. ALLEN: Well, it's kind of the
5 discussion we had the last Work Group meeting.

6 CHAIRMAN ZIEMER: Yes.

7 DR. MCKEEL: Dr. Ziemer, this is
8 Dan McKeel.

9 CHAIRMAN ZIEMER: Yes?

10 DR. MCKEEL: May I make a quick
11 comment, please?

12 CHAIRMAN ZIEMER: Yes.

13 DR. MCKEEL: I want to make a
14 comment about not being exposed during a
15 rolling mill operation. The men at Dow who
16 rolled a lot of thorium containing alloy
17 plates mentioned that as part of that process
18 often there would be little buckles and rough
19 places in the roll sheets and plates, and they
20 would have to go with a piece of, basically,
21 sand paper, which they held in their hands
22 right against the rolled sheets and sand it

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1 off.

2 CHAIRMAN ZIEMER: Probably sanding

3 --

4 DR. MCKEEL: So they say that there
5 was intimate exposure during the rolling
6 operation, so I just needed to mention that,
7 and I also need to mention you all are
8 continually talking about Putzier effect,
9 derbies, and ingots, and I just need to enter
10 into it again that that was one type of
11 uranium metal. The other type was the one-
12 step.

13 That was a two-step process, and
14 then the second process patented at
15 Mallinckrodt, used at Mallinckrodt downtown,
16 used at Weldon Spring was the one-step dingot
17 process, and what that resulted is a
18 different, thicker outer crust, but in both
19 cases, for the ingot and the dingot, it didn't
20 just flake off.

21 It had to be -- and we have
22 provided photographs of this and descriptions

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1 of this process. The crust had to be machined
2 off with vertical lathes, and we've shown
3 pictures of that being done, and at that
4 point, if you know where to machine that off,
5 what resulted was a bright, shiny inner
6 uranium core that then developed an oxide and
7 all that.

8 So, we believe that there probably
9 was a difference in a one-step dingot and a
10 two-step ingot in the amount of thorium-234
11 that built up in that crust, and to ignore
12 dingots altogether is just not representative
13 of what was going on.

14 And you might say, "Well, how many
15 places use dingots?" Well, we know at least
16 from technical documents at Mallinckrodt that
17 Mallinckrodt dingots now, not ingots, which
18 were also used, but they were sent as fuel
19 rods to the Hanford Production Reactors.

20 In fact, the dingots were used
21 there for quite a while, and then the dingots
22 were finally scrapped, because they were not

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1 dimensionally stable in the reactor.

2 They swelled, and despite adding
3 trace metals and other alloys, they couldn't
4 correct that problem over what they got with
5 ingots. But, in the meantime, the dingots
6 went to at least, you know, Weldon Spring and
7 Hanford and probably other sites around the
8 complex.

9 So I just -- I just think it's
10 really short-changing the real world to not
11 consider the differences between the outer
12 crust of an ingot and a dingot with respect to
13 the Putzier effect. I'll just let it rest at
14 that.

15 MR. THURBER: This is Bill Thurber.
16 Bob Anigstein, didn't -- did you make a
17 calculation that showed what the atom surface
18 density might be for thorium-234?

19 DR. ANIGSTEIN: In terms of the
20 physical surface density?

21 MR. THURBER: Yes, in terms of how
22 thin a layer would actually produce this

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1 effect.

2 DR. ANIGSTEIN: Oh, microscopic.

3 MR. THURBER: Microscopic. See, I
4 think one of the confusions here is this, that
5 the crust that Dr. McKeel talks about is
6 probably uranium oxide. The surface -- the
7 extraordinary surface concentration associated
8 with the thorium-234 is microscopic. You
9 can't see it, so we're talking about two
10 totally different things here.

11 DR. MCKEEL: Well, the crust that
12 I'm talking about, Dr. Thurber, is not uranium
13 oxide. I'm talking about the crust that has
14 to be cropped off that results after the bomb,
15 and that's magnesium fluoride.

16 MR. THURBER: Yes, I understand
17 that.

18 DR. MCKEEL: Okay.

19 MR. THURBER: Yes.

20 DR. MCKEEL: All right. Okay.

21 MR. THURBER: But that has nothing
22 to do with the Putzier effect, per se. That

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1 involves microscopic thickness of thorium
2 atoms on the surface of the uranium shape.

3 DR. MCKEEL: The uranium core?

4 MR. THURBER: The uranium shape,
5 whatever it is, dingot, ingot.

6 DR. MCKEEL: Well, that's what I'm
7 trying to tell you. What was sent over to
8 General Steel, for instance, is a uranium
9 dingot with the crust intact, still on the
10 inner core, and that's why radiography was
11 done to define how thick the crust was and
12 then to allow machining with a vertical lathe
13 to remove it so that very little, if any, of
14 the uranium core was involved.

15 So I think the, you know, the
16 surface dose that somebody put their hand on,
17 unless they were working with a freshly
18 scalped uranium inner core, was putting their
19 hand on top of the magnesium fluoride shaggy
20 crust that was on the outside of those
21 dingots, and there was also a shaggy coat on
22 the outside of the ingots before they were

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1 cleaned up, as they came out of the bomb, and
2 there are numerous pictures showing that.

3 MR. THURBER: Yes, but there is --

4 DR. MCKEEL: Okay.

5 MR. THURBER: It's my
6 understanding, and I could be wrong. It's my
7 understanding that the Putzier effect was not
8 observed on the product of the bomb reduction.

9 DR. MCKEEL: Well, then that needs
10 to be -- well, what -- then it was observed on
11 a freshly scalped ingot?

12 MR. THURBER: No, it was a freshly
13 cast ingot.

14 DR. MCKEEL: You don't understand.
15 There isn't any way to cast an ingot without
16 having -- it's all done in the bombs, which
17 have that coating of magnesium fluoride,
18 whether it's an ingot or a dingot.

19 MR. THURBER: In the two-step
20 process, if you take the product of the bomb
21 reduction --

22 DR. MCKEEL: Yes.

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1 MR. THURBER: -- and you recast it
2 in a vacuum induction furnace, and it is in
3 the vacuum induction furnace in particular
4 where the Putzier effect is observed, and
5 there are -- there is patent out there which
6 says that you don't get the Putzier effect in
7 the bomb-reduced product, per se, before it is
8 recast.

9 DR. MCKEEL: Okay. Well, if all
10 that's true, is that going to be in TBD-6000?
11 I think that ought to be clearly explained,
12 then.

13 CHAIRMAN ZIEMER: That could
14 certainly be included in the explanation. The
15 crust that you're talking about, can somebody
16 enlighten me as to -- that's not a crust that
17 increases the surface dose, is it? It's not -
18 - it's not an active product. If anything, it
19 would decrease the surface dose, I would
20 think.

21 DR. MCKEEL: That's right, unless
22 the thorium-234 accumulates on the surface of

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1 the crust.

2 MR. ALLEN: In the thermite
3 process -- the reduction bomb process,
4 usually, magnesium metal mixed with uranium
5 tetrafluoride reaction causes the fluorine to
6 go with the magnesium and create magnesium
7 fluoride. The leftover uranium is simply
8 uranium metal in a molten form that drains to
9 the bottom of this pot.

10 DR. MCKEEL: There you go. That's
11 exactly what I was saying. So the thorium
12 does go with the magnesium fluoride. That's
13 their entire point.

14 DR. ANIGSTEIN: He's right.

15 DR. MCKEEL: And it's been
16 overlooked. Anyway, I can't make that point
17 any stronger.

18 CHAIRMAN ZIEMER: I want to get
19 some clarity on this. Are we saying that the
20 crust itself is higher in thorium content than
21 is accounted for? Is it like the Putzier
22 effect? Otherwise, we thought we had

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1 enveloped this whole thing with the Putzier
2 effect. Bob?

3 DR. ANIGSTEIN: The Mallinckrodt
4 TBD states that the surface dose or the
5 activity, exposure rate at the surface of
6 freshly -- of the freshly created magnesium
7 shapes in the bomb process is actually lower
8 than from aged uranium in equilibrium with its
9 progeny.

10 You have actually -- at first, I
11 was puzzled by that, because I thought here
12 the Putzier said it's higher. They say it's
13 lower, and the two are not inconsistent or two
14 different processes.

15 And Bill Thurber and I -- Bill,
16 correct me on this if I'm not quoting right --
17 had discussed the possibility of this
18 scalping, and from a metal production
19 standpoint it really doesn't make much sense,
20 because when you want to remove the scalping,
21 and you know, certainly the vertical lathe is
22 not only -- I don't have a picture of it, but

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1 it's perfectly reasonable they would do that.

2 The coating is not uniform, so one
3 radiograph or a couple of radiographs, like I
4 said, four-shot, four-corner shot, would not
5 tell you how much to remove. The machinist
6 knows how much to remove. There is a very
7 visible difference between the scale and the
8 metal, and they would just go --

9 CHAIRMAN ZIEMER: Until they got
10 what they wanted.

11 DR. ANIGSTEIN: They would just go
12 gradually, a thousandth of an inch at a time
13 if necessary, until they see, "Okay, we got
14 rid of scale. Now we're down to the uranium."

15 DR. MCKEEL: Dr. Anigstein, I just
16 read you all from Weldon Spring. I think it's
17 TBD-28. It says, "The amount of metal to be
18 removed by cropping in order to produce sound
19 material for rolling is determined by the use
20 of high energy X-rays."

21 Now, I don't know how much clearer
22 that could be, so the idea that you don't need

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1 radiographic delineation of the interface
2 between the inner uranium core and the outer
3 crust is just contradicted by a large volume
4 of literature that's been provided.

5 So I can -- I personally cannot
6 prolong this argument any longer. I think --
7 I think that's just the way it is, and it's
8 been very well documented, so I think I'm just
9 going to have to let it go at that.

10 CHAIRMAN ZIEMER: Well, in any
11 event, my question remains. What is the
12 characteristic of the crust that would require
13 us to deal with it separately as far as
14 exposures to the worker are concerned?

15 DR. MCKEEL: Well, Paul, I would
16 say the reason why is because, as was just
17 stated, the thorium goes -- binds to the
18 magnesium components of the magnesium fluoride
19 crust and that that's where the action is.
20 That's where the -- I mean, that's where it's
21 located. That's where the thorium is located
22 that we're talking about.

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1 CHAIRMAN ZIEMER: Okay. Thanks.

2 Let me --

3 DR. MCKEEL: All right.

4 CHAIRMAN ZIEMER: Dave?

5 MR. ALLEN: Dr. McKeel interrupted
6 me when I started that process, but I
7 definitely didn't say that thorium goes with
8 magnesium. I simply don't know if it stays
9 with the uranium or goes with the magnesium.

10 You will have left at the end of
11 this process a derby, or if you're doing a
12 direct ingot you'd have an ingot. It will
13 have a magnesium fluoride type of crust on it.

14 I know at Fernald it was you
15 produced derbies first and then re-melted
16 those in the -- recast them, and the derbies
17 you had to break out of this hard, crusty
18 magnesium fluoride left over from the
19 operation, and they even needed pneumatic
20 hammers type of thing to get some of this off.

21 CHAIRMAN ZIEMER: Dr. McKeel, were
22 you aware of any references that indicate the

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1 thorium is with the crust? That's what I'm
2 trying to --

3 DR. MCKEEL: There is a table that
4 I provided in one of the Weldon Spring
5 brochures. I can't -- the atomic fuels or
6 fuel for the atomic -- I can't remember.
7 Maybe Mr. Ramspott can remember which one, but
8 in one of those tables it mentions as a
9 component of the Weldon Spring uranium, some
10 thorium, and it's at a very low level, and I'm
11 not even sure.

12 I don't think that table mentions
13 thorium-234. I think it mentions thorium-232,
14 so that's the only information that I know
15 about that, and, you know, that's obviously a
16 crucial point.

17 CHAIRMAN ZIEMER: Okay.

18 DR. MCKEEL: But what Dave Allen
19 just said I appreciate that needs to be also
20 understood that the derbies did not come out
21 as clean, shining, smooth uranium. They also
22 had that magnesium fluoride crust, and Dr.

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1 Anigstein is exactly right that it was of
2 highly variable thickness, and it was a rough
3 coat on there, and it had, as David said, it
4 had to be chipped out with pneumatic hammers,
5 and you can imagine how precise that operation
6 is. So, anyway --

7 CHAIRMAN ZIEMER: Okay.

8 DR. MCKEEL: Okay.

9 CHAIRMAN ZIEMER: Well, I think
10 some good points there, and probably, Bob,
11 you're probably right when even with an X-ray
12 picture, which would show the unevenness, the
13 machinist probably had to continue to get that
14 down to the shiny surface with the machining
15 operation.

16 But I guess now I'm concerned that
17 have we characterized the surface dose rates
18 of the dingots? Do we know the thorium
19 content? It sounds like something sort of
20 analogous to the Putzier effect in that you
21 have -- maybe have thorium there or not. Do
22 we know that?

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1 MR. ALLEN: Well, we weren't
2 looking at that as part of this. We haven't
3 seen anything that says that, at least, no
4 significant type of effect like that with the
5 thermite reduction process.

6 CHAIRMAN ZIEMER: Okay. Can we
7 agree that as part of the revision that you
8 develop in discussing the Putzier effect that
9 you will also discuss the crusts relating to
10 the dingots and whether or not there are
11 elevated exposure rates from those things that
12 would need to be taken into consideration?

13 DR. MAURO: I'd like to add there's
14 one more step in the process there, I think,
15 when you tell the story. You still have the
16 uranium hexafluoride, which is the material
17 you put in the bomb.

18 If that's freshly produced uranium
19 hexafluoride, there is no thorium, okay. So,
20 therefore, if it's old, there will be thorium.

21 So, unfortunately, it's all the timing, so if
22 you go in, and you go through the reduction

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1 process with fresh uranium hexafluoride,
2 you're not going to get the thorium.

3 If it's aged, you can get the
4 thorium, and whether or not it shows up in the
5 crust is another matter, so if you just --

6 CHAIRMAN ZIEMER: It's got to be
7 discussed in that framework.

8 DR. MAURO: Part of your story.

9 CHAIRMAN ZIEMER: Right.

10 MEMBER GRIFFON: But I think those
11 are things you can't know.

12 DR. MAURO: That's right.

13 CHAIRMAN ZIEMER: Right, and if you
14 don't know, you'll have to make some
15 assumptions, so --

16 MR. ALLEN: Just from my past
17 experience, I remember getting uranium
18 tetrafluoride in from the gas diffusion plants
19 that had been there for several years.

20 DR. MAURO: See, there you go. And
21 that's going to have thorium.

22 MR. ALLEN: When we did the

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1 reduction, we didn't see the highest data dose
2 in the reduction area that we did see in the
3 recalculated --

4 DR. MAURO: Is that right?

5 MR. ALLEN: That's an experience.

6 MR. RAMSPOTT: Dr. Ziemer?

7 CHAIRMAN ZIEMER: Yes?

8 MR. RAMSPOTT: This is John
9 Ramspott.

10 CHAIRMAN ZIEMER: Yes, John?

11 MR. RAMSPOTT: I'm going to email
12 you the booklet that definitely mentions
13 thorium. It's published by Mallinckrodt. It
14 was done by Harold Thayer, the President of
15 Mallinckrodt. It was in my original workbook
16 that I gave you guys four years ago, and I'm
17 going to resend that to you in about two
18 minutes.

19 CHAIRMAN ZIEMER: Okay.

20 MR. RAMSPOTT: And it definitely
21 says it, but I have another -- I'm really
22 confused. In looking at page nine of TBD-

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1 6000, it says all radiation must be included
2 in dose reconstruction on page nine, very
3 clearly, and let some dose reconstructor --

4 I've heard the words "maybe,"
5 "possibly," "if it makes a difference," "if
6 it's marginal." I don't see that anywhere in
7 the law. I think it says "must."

8 I would think this has to be
9 considered in any revision to TBD-6000, unless
10 I'm reading this incorrectly, but that's what
11 the document says in front of us, and it said
12 it in about three other documents we have.

13 Everybody -- matter of fact, Dr.
14 Neton just referred to "all" and "must"
15 earlier in this meeting. I would think the
16 Putzier effect would go under that "all" and
17 "must," unless I'm missing something, and if
18 somebody could explain that to me, I'd sure
19 appreciate it.

20 CHAIRMAN ZIEMER: And, in fact,
21 it's the intent that these do be included.
22 That's why we're having this discussion.

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1 MR. RAMSPOTT: That's what I
2 thought, but I heard some dose reconstructor
3 would have the option of maybe using it.

4 MEMBER GRIFFON: John, that was my
5 -- I think that was my comment, and I was
6 saying that if -- you know, it's NIOSH's
7 efficiency process, kind of. If it was a
8 compensable claim, then they wouldn't even --
9 you know, it wouldn't have to be any further
10 consider -- it was just an efficiency process,
11 but in general you're right. All doses have
12 to be considered.

13 MR. RAMSPOTT: I guess I was
14 misunderstanding that, then, because I heard -
15 - I mean, I wrote it down. It was about ten
16 references to maybe, possibly, could be. I
17 don't think that's the intent of the law. I
18 don't think some dose reconstructor should
19 have that option.

20 CHAIRMAN ZIEMER: Well, no. You've
21 got to understand that the Putzier effect is
22 not always there for every condition, so they

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1 -- that's the issue. If it appears that it
2 has to be taken into consideration, then
3 that's what the dose reconstructor has to do.

4 MR. RAMSPOTT: Isn't that kind of a
5 maybe? How does he know what sites? As John
6 Mauro was saying, how do you know? Does it
7 grow back in?

8 CHAIRMAN ZIEMER: Yes.

9 MR. RAMSPOTT: I mean, it could be
10 there. How does this dose reconstructor, how
11 is he the all-knowing whether it's there or
12 not?

13 CHAIRMAN ZIEMER: Well, that's why
14 I asked to look at the specific case, if it's,
15 you know, whether it's -- and if he can't
16 determine that, then he has to assume that
17 it's there, so then that's how it's taken into
18 consideration.

19 In any event, let's ask that NIOSH
20 include this discussion as they do the
21 revision, and I think the net result will be
22 this will end up in abeyance until we see. I'm

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1 wondering if you can, Dave, perhaps for the
2 next time develop for us what the wording
3 might look like in terms of the revision.
4 Would that be feasible? I know that --

5 MR. ALLEN: I think so, yes.
6 There's been enough discussion. I think it's
7 probably worth drafting it and sending it
8 around to the Work Group, at least.

9 CHAIRMAN ZIEMER: Yes, so that we
10 have a -- what will the revision contain in
11 terms of dealing with the Putzier effect, in
12 terms of dealing with the crusts on the
13 dingots, and the related matters in terms of
14 how dose is reconstructed for these cases
15 where there are extremity cancers. Bob, any
16 additional comments?

17 DR. ANIGSTEIN: Yes. About this
18 business of the cropping of the ingots -- Bill
19 Thurber?

20 MR. THURBER: I'm here.

21 DR. ANIGSTEIN: Is it your -- would
22 you agree with my impression that the cropping

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1 is not turning it on a lathe but cutting off
2 the ends?

3 I know that in the vacuum
4 induction process that I was familiar with at
5 the Manufacturing Sciences Corporation -- that
6 was a facility at -- not part of but inside
7 Rocky Flats where once they cast the ingot, on
8 top you would get a porous area, region, which
9 was not good metal and also would contain a
10 lot of thorium.

11 And you referred to it as the hot
12 top, and it would be cut off with a bandsaw,
13 and then, of course, the bad part would simply
14 be thrown right back into the recycling
15 process and, you know, and then run back in.

16 And that would be very -- that
17 would be very consistent with what we heard
18 from one of the workers where they didn't
19 radiograph all the edges. They just
20 radiographed the corner. They took a two-
21 corner shot.

22 Then they flipped the ingot over

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1 and took the other two corner shots, so it
2 seemed to me like they were looking for the
3 ends, not for the entire periphery, and there
4 you would need guidance, because the machinist
5 would not know where to place the saw in terms
6 of getting all of this defective metal at the
7 end, not necessarily contaminated metal, just
8 porous and not nice, uniform shape for
9 rolling. Does that make sense, Bill?

10 MR. THURBER: That's correct, Bob.

11 Common -- common terminology in the industry
12 for cropping is exactly what you say. It's
13 cutting the end off, and it may be the bottom
14 for other reasons but particularly the top
15 because of porosity if you're dealing with an
16 alloy, segregation of metal to the top and so
17 forth, but that's the proper -- that's the
18 commonly accepted industry terminology for
19 cropping is cut the ends off.

20 DR. ANIGSTEIN: Good. Thank you.

21 DR. MCKEEL: Well, the other term
22 that's used -- this is Dan McKeel again -- is

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1 scalping, so if you read that literature,
2 cropping is one term that's used, and,
3 actually, John has some information -- I
4 think, again, that we've sent to the Work
5 Group -- that indicates that cropping could be
6 as much as the top third of an ingot, so it
7 wasn't just some little crust, and it varied
8 from ingot to ingot.

9 So, you know, and I am absolutely
10 100 percent positive from the literature that
11 we've read that ingots were covered. As they
12 came out of the bomb, they were covered,
13 sides, top, and bottom, with this magnesium
14 fluoride residual crust from the bomb, and the
15 two words I've seen described of that are, at
16 least, cropping and scalping.

17 MR. THURBER: Again, we're talking
18 about two separate things here, and we're
19 confusing the terminology and the operations
20 that were done. In the case of a cast ingot,
21 which is what you're going to use as the
22 starting point for your rolling or for your

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1 extrusion or whatever, that is the ingot that
2 Bob was talking about that is cropped, and it
3 may be a third. If it's a bad casting, you
4 could throw the whole thing away.

5 Now, the bomb product is something
6 else and was treated differently. Indeed, it
7 had scale on it that, as David Allen or
8 someone -- I'm not sure who -- suggested is
9 chipped off with a pneumatic hammer.

10 That was a different animal,
11 treated in a different way, and I haven't seen
12 the evidence, and there was someone in the
13 background there talking that I think said
14 there was no evidence of high beta exposures
15 when handling the product of the bomb
16 reduction.

17 So we're talking about two
18 different things, and we have to be very
19 careful about the kinds of operations we're
20 attributing to each physical entity in the --
21 in the process.

22 DR. MCKEEL: Well, I can tell you

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1 that -- this is Dan McKeel again -- that with
2 respect to General Steel and Dow -- which at
3 Dow, of course, they did experimental
4 extrusion of uranium from Weldon Spring, and
5 they did rod straightening for the fuel rods -
6 - the material that they sent over from Weldon
7 Spring from Weldon Spring literature was
8 derived from dingots, so that's just the way
9 it was.

10 So I think that we, at this end,
11 understand the operations. I think that the
12 exact operations involved and the distinctions
13 you're making need to be gotten straight with
14 NIOSH, and that needs to be much clearer than
15 it is now in TBD-6000, and I think that's what
16 we're talking about.

17 CHAIRMAN ZIEMER: Yes, and we have
18 a commitment for NIOSH to discuss this in the
19 revision, and Dave is going to prepare a -- I
20 guess I'd call it a preliminary draft for the
21 Work Group to look at. Of course, we will
22 make it available to the rest of the folks,

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1 too.

2 I presume that if we're able to --
3 it's a working document of an agency, so I
4 don't know how to commit on this, but we're
5 going to have a look at what that will be, so
6 this particular item I think automatically
7 will go into abeyance then until we see that
8 product, and then we can perhaps close it at
9 that time.

10 Thank you for input on that. I
11 want to move us onto Appendix BB specifically
12 now, which is, of course, the General Steel
13 Industries Matrix, and we have some open items
14 there that we want to discuss as we move
15 forward here. Under agenda, it's item 4.

16 Issue 1 was NIOSH evaluation of
17 new documents relating to source term and also
18 status of the film badge records, and let me -
19 - let me start us with the second of these,
20 because I think this is going to be maybe a
21 brief report.

22 You may recall that NIOSH has

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1 issued a contract, I believe, to Landauer for
2 the purpose of having Landauer go through all
3 the Picker records that they had on hand to
4 try to identify any that were related to
5 General Steel Industries, and actually, I
6 think the contract goes beyond that to cover
7 other facilities for which Landauer might have
8 Picker records that apply to other facilities
9 in the program.

10 Dave, can you report to us on the
11 status of that, the Landauer film badge
12 information?

13 MR. ALLEN: Well, what we have been
14 told by Landauer is that Picker dosimetry data
15 would have been incorporated into their
16 microfiche library, essentially. That is not
17 set up, apparently, in a way that is easily
18 retrievable. It's all account numbers, et
19 cetera. We gave them a contract to, not just
20 with GSI, to basically catalogue all the --

21 CHAIRMAN ZIEMER: All the records.

22 MR. ALLEN: All the customers that

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1 they had, the time frames they had records
2 for. They got about -- we got a partial list
3 from them, and it ran out of money. We're
4 trying to get some more money for that to get
5 the rest of it. It's apparently a fairly
6 large job for them to do this, and the partial
7 list we got was nothing --

8 CHAIRMAN ZIEMER: Nothing so far
9 related to General Steel Industries? This is
10 only a -- is it a partial list of records or
11 just the names of facilities where they have
12 records?

13 MR. ALLEN: It's a partial index,
14 essentially, is what it amounts to. It's the
15 list of companies that they have film badge
16 records for and the time frame that they have
17 it, and it's not necessarily -- you know, you
18 won't necessarily have GSI 1964 to 1972.

19 We might have GSI 1964 to '66 and
20 then a separate set of records that goes
21 beyond that. It's a bit of a hodgepodge
22 there, but we're getting a catalogue where we

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1 can search it and they can search it, and we
2 can ask for a specific set of records is the
3 goal here.

4 CHAIRMAN ZIEMER: So that's
5 ongoing.

6 MR. ALLEN: Still ongoing.

7 CHAIRMAN ZIEMER: And --

8 MR. ALLEN: It's apparently a very
9 big job.

10 CHAIRMAN ZIEMER: My understanding
11 from them it's kind of an overload thing there
12 --

13 MR. ALLEN: Yes.

14 CHAIRMAN ZIEMER: It's not their
15 highest priority in terms of what they're able
16 to do in terms of taking care of their own
17 customers, I suppose. Is that correct?

18 MR. ALLEN: Yes, that's the way I
19 understand it. It's a very big job that is
20 done as they can type of thing. The contract
21 with us is not big enough for them to ignore
22 their customers or anything, so they catch

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1 time when they can.

2 CHAIRMAN ZIEMER: Well, it may or
3 may not provide additional input for us, and I
4 guess at this point we can't count on that as
5 being available in the near future, and I
6 think, certainly, on General Steel we have to
7 proceed with what we have in hand, and, you
8 know, we're not going to sit around for years
9 and wait for something to be found there.

10 Bob, did you have additional
11 comment?

12 DR. ANIGSTEIN: Yes, I'd like to
13 comment on that since it was SC&A that came up
14 with the idea, I believe, that the Picker --
15 you know, one of our -- one of our associates
16 found out that they did, in fact, have the,
17 you know, records from Picker, and one of the
18 workers, former workers, had suggested that
19 because they bought their regular X-ray film
20 from Picker, perhaps Picker was the supplier.

21 However, having looked at the
22 information from NRC, formerly AEC, of all of

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1 the license records, the document related to
2 licensing, it appears that Picker was not the
3 purveyor.

4 It was a company called Nuclear
5 Consultant Corporation, which my impression
6 was it was like a one-man firm with his family
7 members or whatever helping, and that they
8 supplied both. They did the radiation safety
9 surveys, and they supplied the film badge,
10 film badges, and that company has -- actually,
11 Dr. McKeel pointed out and I confirmed -- was
12 purchased by Mallinckrodt sometime in the
13 '60s.

14 But since, to my knowledge, and I
15 hesitate to -- I'm not pretending to be an
16 expert on old film badge companies.
17 Mallinckrodt was not in the film badge
18 business, so it would seem unlikely that those
19 records would have been preserved.

20 CHAIRMAN ZIEMER: Well, in any
21 event, the probability of this particular
22 pursuit bearing fruit for this facility seems

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1 more remote than it did originally, but NIOSH
2 is still pursuing it because it may provide
3 some information for other facilities, which
4 will make it worthwhile.

5 But we now have the other
6 documents that you referred to, and I agree
7 there is no hint in those other documents that
8 Picker X-ray was involved in the film badge
9 dosimetry at all for this facility.

10 Now we do have, relating to issue
11 1 on the matrix, which is dealing with source
12 term information and that sort of thing, we
13 have -- well, you've gotten two things since
14 our last meeting.

15 One is Dr. McKeel made available
16 to the Work Group Members the NRC website on
17 which all of these documents are available,
18 and we've been able to -- Work Group Members,
19 if you wish to, could look at those individual
20 documents, the licenses, various
21 correspondence, inspection reports, and so on,
22 so a lot of material there, some clarity on

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1 source terms, which had been somewhat lacking
2 before but some confirmations in some cases of
3 those source terms and so on.

4 From that, NIOSH has presented a
5 new analysis for us, and this was distributed,
6 I believe, to -- well, I know to the Work
7 Group Members, as well as to the petitioner,
8 and this is called -- hopefully, we'll get the
9 right paper here -- "Portable Radiography
10 Sources at GSI," prepared by Dave Allen, DCAS,
11 May 2010.

12 Dave, I think probably it would be
13 worthwhile for you to give us a quick overview
14 of this and indicate what has changed since
15 your original sort of approaches to dose
16 reconstruction at GSI based on this
17 information.

18 MR. ALLEN: Okay. Let me pull
19 that up here. This was intended to be -- it
20 says "Portable Sources," because I, you know,
21 kind of took this one bite at a time. I wasn't
22 dealing with the betatron or anything like

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1 that.

2 CHAIRMAN ZIEMER: Right. This is
3 separate from the betatron.

4 MR. ALLEN: We had gained --

5 CHAIRMAN ZIEMER: Betatrons.

6 MR. ALLEN: We had gained the
7 information from the NRC documents, and it
8 also incorporates information we've been told
9 in the various Work Group meetings or worker
10 outreach meetings.

11 We've got the time frames when two
12 smaller, approximately quarter curie, cobalt-
13 60 sources were purchased by GSI. It was in
14 essentially the middle of 1962. We have --
15 the exact assay of them was .26 and .28
16 curies.

17 We have information from those
18 records that they gave to AEC that prior to
19 that they were using two 500-milligram radium-
20 226 sources, so that gives us an assay value,
21 and they don't decay very quickly, so we can
22 pretty much know what assay value they were

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1 using.

2 We have from, I believe, the last
3 Work Group, possibly the one before,
4 information that they would rope off an area,
5 delineate an area somehow that was one and
6 one-half times what was the required boundary.

7 The required boundary by AEC at the time was
8 two millirem per hour, and we also had
9 information that the radiographers would leave
10 that area, go run film or whatever, and
11 sometimes workers would walk through those
12 delineated areas, didn't necessarily comply
13 with those boundaries.

14 Taking all that into account, we
15 tried to see what we could do, what we would
16 do with that. From the assay values, the two
17 cobalt sources and the radium sources we've
18 been using the gamma ray constants of these
19 well known types of sources, we could come up
20 with dose rates at a foot, and using the -- I
21 can't think of the rule now.

22 Using well known physics, we can

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1 determine the dose rate from various
2 distances, and we come up with a preliminary
3 assessment in here that basically said, "If
4 the radiographer was standing at the boundary
5 the entire time that they were X-raying, what
6 would the dose be for the year?"

7 We then went into a dose estimate
8 essentially for folks walking through that
9 area, and that was the more complicated part,
10 of course, and for that we essentially said --
11 we essentially are assuming they are standing
12 at the edge of the boundary any time they're
13 not walking through it.

14 And when they're walking through
15 it, it's modeled as a straight line at various
16 distances from the source, the assumption
17 being they weren't doing that for the sole
18 purpose of getting a radiation exposure. They
19 were trying to get from Point A to Point B.

20 So we -- this is relatively easy
21 math. It's not too hard of a math problem to
22 estimate what the size of that boundary is,

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1 how long it would take them to walk through
2 there, and what the dose rate would be as they
3 got closer to the source and then further
4 away.

5 From that average dose rate and
6 the time, we can come up with the dose they
7 would get for that trip through the area, and
8 essentially we just added that up, plus
9 assuming they were standing at the boundary
10 the rest of the time, and came up with a dose
11 estimate for these non-radiographers that were
12 walking through the area. That's the
13 background on this. There's more detail in
14 here, of course.

15 CHAIRMAN ZIEMER: It's interesting
16 the way this works out. It turns out the non-
17 radiographers end up with a higher dose
18 assignment than the radiographers simply
19 because of the assumption that the others on a
20 regular basis are penetrating into the area
21 rather than observing from the so-called safe
22 distance, but that's the way it works out.

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1 Now can you summarize how you
2 would use this information in terms of
3 claimants from this site?

4 MR. ALLEN: Yes --

5 CHAIRMAN ZIEMER: And what has
6 changed since, for example, as compared to
7 previously processed dose reconstruction?

8 MR. ALLEN: I did want to add I
9 left out one piece of this, and that was the
10 radiation survey around the radiography room
11 in the number six building. There was a
12 survey done around that with the cobalt-60
13 sources inside.

14 I took -- there is a maximum dose
15 rate outside the building, plus an average
16 dose rate in various locations, as well as
17 there is a smaller room inside the building
18 for the operators and the dose rates in that
19 room, and I used those dose rates to also come
20 up with a dose estimate for using that
21 building or that room.

22 I summarized everything at the

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1 bottom of this, you know, and, as you said,
2 you know, the non-radiographer is getting more
3 dose simply because of penetrating the
4 boundary, the safe distance boundary.

5 So essentially I end up with
6 several different estimates here,
7 radiographers, non-radiographers, also the
8 overhead crane operator, since we did have a
9 survey of the cab of that crane with the
10 cobalt-60 sources exposed.

11 And the way it would be used now
12 is this is all in the -- well, the radiography
13 room is in the number six building. It's some
14 distance from the betatron building.

15 Right now, for the non-
16 radiographers in Appendix BB it is based on
17 the stray radiation from the betatron
18 building, assuming they are there the whole
19 time, and that is approximately 1.7 rem per
20 year.

21 These doses are a little lower,
22 not greatly lower for non-radiographers. It's

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1 -- you've got 1.35 rem. You've got, well,
2 another 1.35 rem. They can't be in two places
3 at once. So essentially the idea with this
4 would be assess doses you would get if you're
5 over in this area walking through these roped
6 off areas or standing near the number six
7 building radiography room or if you're over by
8 the betatron building or if you're working
9 inside the betatron building or if you're
10 working with the castings after they're X-
11 rayed and assess all the possible sources of
12 radiation and then essentially pick the worst
13 case is what it amounts to would be the
14 ultimate goal in revising Appendix BB.

15 CHAIRMAN ZIEMER: Now let me first
16 ask if there are any questions here on this,
17 and then I have some thoughts on how we
18 proceed relative to this document. Any
19 questions on either the information or the
20 approach that was used in these? Bob, did you
21 have a question?

22 DR. ANIGSTEIN: Well, I have one

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1 comment, which is basically, you know, for the
2 moment we've -- obviously, we just saw the
3 report --

4 CHAIRMAN ZIEMER: Right.

5 DR. ANIGSTEIN: Basically, we
6 haven't reviewed it, certainly not all the
7 documentation. The approach to the cobalt-60
8 sources seems reasonable.

9 However, the extrapolating -- back
10 extrapolating that the same practice was
11 followed with the radium sources is something
12 that we, John and I, have a problem accepting
13 because, having looked at some --
14 documentation that was furnished as part of
15 the -- with the NRC AEC licenses, they
16 suddenly -- back in '62, they suddenly got
17 religion.

18 They were apparently scolded by
19 the State of Illinois, and we have no records,
20 and there probably are no records, as far as
21 anybody knows, we never will get records from
22 the State of Illinois.

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1 We have no idea what degree of
2 oversight there was, but they were using this
3 fishpole technique with the radium source,
4 which I looked that up, for everybody's
5 information. It's exactly what it sounds
6 like. There would be a long rod with a string
7 and a hook on the end, and they would use that
8 to snag the radium source.

9 Presumably, the radium source
10 would be in some kind of a shield, open on
11 top, and they would have a little hook on the
12 -- there would be a little eye bolt or
13 something, eyelet on the end, and they would
14 engage that with the hook at the end of the
15 fish pole and lift it out, carry it to
16 wherever it needed to be placed, presumably on
17 the far side of the casting or in the middle
18 of a round casting.

19 So there was no building. There
20 was no concrete building at that time.
21 Concrete building was built. The film badge -
22 - the NCC firm, the Nuclear Consultant

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1 Corporation, was called in to provide the
2 radiation safety, everything to be in
3 compliance with the AEC rules. Otherwise,
4 they would not get their license.

5 Prior to that, we have no idea
6 what radiation safety -- I'm being a little
7 facetious to say if any. There must have been
8 some, but what radiation safety they have.

9 So we cannot say that the same
10 analysis, merely changing the gamma factor and
11 the strength of the source, that the same
12 analysis that was done with a quarter curie
13 cobalt-60 sources would apply to the half
14 curie radium-226 sources. I think that's a
15 dark age there that nothing -- next to nothing
16 is known about. I'm not sure anything.

17 CHAIRMAN ZIEMER: Well, what is
18 known is that they used the fishpole
19 technique, and the reason for that was it
20 forces a certain distance, so that part is
21 reconstructable.

22 DR. ANIGSTEIN: Right.

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1 CHAIRMAN ZIEMER: We also know why
2 the State of Illinois and the NRC required the
3 radium work to cease. It had nothing to with
4 GSI.

5 This was nationwide in the early
6 sixties, and the reason was radium sources
7 were leaking virtually everywhere because of,
8 presumably, build-up of helium in the source,
9 which is what the alphas become once they give
10 up their energy. So everyone pretty much was
11 required to stop using radium sources
12 nationwide.

13 So I don't know if there were
14 implications that GSI somehow had poor
15 practices and were being scolded for using
16 radium. Everybody was required pretty much to
17 stop using radium, so that issue -- but you're
18 quite right that we don't know, for example,
19 were they roping off at one and one-half times
20 the distance or whatever. I don't think we
21 know that. Maybe we do, but, in any event, I
22 don't think right now we should debate that so

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1 much as we have the report. We've only had it
2 a couple days.

3 I know that the petitioner has a
4 number of concerns about this. I have not
5 gone through them, but I have received from
6 Dan, and I believe others have received his
7 comments, maybe just within the last day or
8 so, on the petitioner's concerns.

9 In fact, from my perspective, I
10 think it may be appropriate for the Work Group
11 to task SC&A to actually do a critical review
12 of this, and maybe the issue that you raised
13 may be one of those issues, and then we can
14 address it.

15 MEMBER POSTON: At the same time,
16 it makes -- it makes -- it's reasonable to
17 assume, to make those assumptions to give you
18 some indication of what the dose is.

19 CHAIRMAN ZIEMER: Right. I think
20 as a starting point you use --

21 MEMBER POSTON: I haven't received
22 any comments from Dan. I had a few questions

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1 that I took them up directly with David.

2 CHAIRMAN ZIEMER: Right, and I
3 have not -- I have not had a chance to review
4 Dr. McKeel's comments myself.

5 MEMBER POSTON: Well, my point is
6 I wouldn't dismiss the assumptions out of
7 hand.

8 CHAIRMAN ZIEMER: Well, no, no,
9 no.

10 MEMBER POSTON: I agree that we
11 don't know.

12 CHAIRMAN ZIEMER: I'm just saying
13 --

14 MEMBER POSTON: It's a reasonable
15 beginning point.

16 CHAIRMAN ZIEMER: Right, and I've
17 gone through Dave's thing in detail, and I
18 thought in my mind the approach was very
19 reasonable. I like the way you did the
20 traversing through there with a lot of
21 different paths and basically kind of
22 integrating and averaging those results out

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1 and so on.

2 There certainly can be some
3 questions about the earlier practices, and we
4 may have to deal with that, but, in any event,
5 it seems to me that we would benefit from a
6 chance to all see what the petitioner's
7 concerns are on this approach, to have SC&A
8 have a chance to take a careful look at it if
9 that's agreeable with the Work Group to do
10 that. Let's get some input here.

11 MEMBER MUNN: Well, I have no
12 disagreement with the current step except that
13 in my perspective what I would like for our
14 contractor to be looking at are things where
15 we feel there might be major glitches or
16 something that's been overlooked or we have
17 concerns with respect to the format, the way
18 the information is presented.

19 Frankly, I just read through
20 Dave's material. I don't believe I've read
21 Dr. McKeel's comments with respect to it. My
22 personal feeling is that I hesitate to assign

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1 work to the contractor until I feel that
2 what's before us and responses to it are of a
3 significant enough nature that we feel like we
4 need that kind of oversight from the
5 contractor.

6 I have no objection to that
7 happening. It just seems that it may be an
8 extraneous move if after some consideration of
9 the documentation that we have we feel that
10 it's adequately -- if we all understand it,
11 the purpose of our technical contractor is to
12 try to bring in oversights or shed more light
13 on something that isn't understood by the
14 Board Members technically.

15 If that's not the case here, then,
16 as I said, I have no objection. It just seems
17 to me that it's a little early for us to do
18 that.

19 CHAIRMAN ZIEMER: We've got other
20 comments here. Mark and Josie, what are your
21 feelings on that?

22 MEMBER BEACH: I agree with your

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1 suggestion that SC&A review it. For me, I
2 think that would be helpful.

3 CHAIRMAN ZIEMER: Mark, what is
4 your --

5 MEMBER GRIFFON: I agree with
6 that.

7 CHAIRMAN ZIEMER: John Mauro, did
8 you have a comment?

9 DR. MAURO: I'll just foreshadow
10 what I see coming in the future. I think that
11 these scenarios, the scenarios as laid out in
12 David's report, perhaps some scenarios that we
13 might look at regarding the fishpole and the
14 kinds of exposures people might have
15 experienced, are all informative in terms of
16 starting to get a sense of what kinds of
17 exposures people might have experienced during
18 this ten-year period where we don't have film
19 badges, and I mentioned this at my last
20 meeting.

21 When we go through this at our
22 next meeting and we come back with a story,

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1 and everybody will agree, "Yes, those
2 scenarios are pretty good, and those doses
3 look pretty good," I think it's -- I think
4 fundamentally the Work Group and everyone
5 concerned has to eventually come to grips with
6 the sense that here we have a ten-year period.

7 Non-destructive testing is going on. Sources
8 are being handled, 500 millicuries of radium,
9 250 millicuries of cobalt during a ten-year
10 period.

11 The nature of the radiologic
12 controls that were in place were of some
13 question because AEC was not involved at that
14 time. It was more of a state-regulated to the
15 extent to which the state was involved.

16 The bottom line is we all know
17 that non-destructive testing using radioactive
18 sources is not unusual for there to be some
19 incidents from mishandling and exposures. In
20 fact, I believe there was even one anecdotal
21 story that a source actually was taken home
22 sometime prior to the -- some time -- I don't

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1 remember the time period, but it was --

2 DR. ANIGSTEIN: It was probably
3 the radium source.

4 DR. MAURO: Perhaps a radium
5 source. What I'm getting at is, you know,
6 everything we do here is going to add value in
7 terms of getting a sense of the magnitude and
8 types of exposures that may have occurred, but
9 in the end, I think we have a very difficult
10 decision to make.

11 Is it an acceptable circumstance
12 for a facility to be operating for ten years
13 without film badges and without apparent
14 radiological control oversight and procedures,
15 et cetera that are self-evident from the
16 literature and say that we can reconstruct
17 those doses with sufficient accuracy.

18 CHAIRMAN ZIEMER: Any other
19 comments?

20 MEMBER POSTON: But you didn't
21 speak to the question. The question was
22 whether or not we should assign SC&A --

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1 DR. MAURO: Oh, I'm sorry.

2 MEMBER POSTON: -- to review
3 Dave's report.

4 CHAIRMAN ZIEMER: I think John --
5 John doesn't have an unbiased view of that.

6 DR. MAURO: We'd be happy to do
7 that, but I'm saying that after we're done,
8 we're just beginning.

9 MEMBER MUNN: I think he just made
10 the sales pitch.

11 DR. MAURO: Oh, no. In fact, I
12 could actually say maybe it's not -- maybe we
13 shouldn't do that. Maybe we should go right
14 to the big issue.

15 MEMBER POSTON: I don't -- I don't
16 -- I agree with Wanda. I don't think it's a -
17 - it's probably premature because I don't have
18 a clue what Dr. McKeel's comments are on this
19 report. I read it. Technically, I find it
20 pretty solid.

21 CHAIRMAN ZIEMER: Well, here's one
22 thing that we can do. We're going to be doing

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1 some tasking next week at the full Board
2 meeting. Perhaps I could ask the Work Group
3 members to, between now and next week, amidst
4 all the other documents you will be reviewing,
5 at least to take a look at Dr. McKeel's
6 concerns, and if you haven't had a chance to
7 go through this in detail, look at it, and
8 then we can make a decision on tasking next
9 week.

10 MEMBER POSTON: Send them to you?

11 Who has the comments? Did you send them to
12 us?

13 CHAIRMAN ZIEMER: Dr. McKeel,
14 didn't we distribute those? Ted, maybe you
15 did.

16 MR. KATZ: Maybe not, because I
17 think -- if this is something that came
18 recently and I was already on the road here,
19 then it wouldn't have been distributed yet,
20 but, anyway, I will distribute them as soon as
21 I get back on Thursday.

22 CHAIRMAN ZIEMER: I know that the

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1 comments came because I got a copy just before
2 I left home. Dr. McKeel, if you're on the
3 line, you sent those out perhaps Monday. Was
4 that correct?

5 DR. MCKEEL: Well, the -- this is
6 Dan McKeel. I believe I sent my comments on
7 David Allen's White Paper the day after I
8 received it, and then that was sent before the
9 document that I sent about reasons that I
10 thought GSI should get an SEC that we're going
11 to talk about later on.

12 MEMBER BEACH: So let me ask. Is
13 --

14 DR. NETON: -- sent on Sunday.

15 MEMBER BEACH: Is that the 13
16 points?

17 MR. KATZ: Did you receive the --

18 CHAIRMAN ZIEMER: I found it here.
19 Dr. McKeel's email went out at 7:00 on Sunday
20 evening. It was sent to -- it wasn't sent to
21 the Work Group. It was sent -- no, it says it
22 was sent to the Work Group.

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1 DR. NETON: No, no. The
2 distribution I have is --

3 DR. MCKEEL: -- sent to the Work
4 Group.

5 DR. NETON: -- was Dr. Ziemer, Ted
6 Katz, Dave Allen, Jim Neton, Stu Hinnefeld.

7 MR. KATZ: Okay. Well, if I had
8 it on Monday, I would have -- are you looking
9 on your CDC accounts right now?

10 MEMBER POSTON: No.

11 MEMBER BEACH: Yes.

12 MR. KATZ: Okay. Well, that's --

13 DR. NETON: I received it Sunday
14 at 10:00 p.m.

15 MR. KATZ: Well, I sent a variety
16 of things from Dr. McKeel on Monday, I
17 believe, so if you look at your CDC accounts,
18 if I had it on Monday, I'm pretty sure I sent
19 it on Monday.

20 DR. MCKEEL: I don't have all the
21 CDC email addresses.

22 MR. KATZ: No, no, no, you

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1 wouldn't have them, Dan, but this is something
2 I do.

3 CHAIRMAN ZIEMER: It did go to
4 Ted. I'm looking at it now. It says that
5 it's addressed to me and the members of the
6 Work Group, but Dan sent it to me, to Ted, to
7 John Mauro, to Dave Allen, Jim Neton, and Stu
8 Hinnefeld.

9 MEMBER BEACH: Ted sent it to all
10 of us on 5/10. I have it right here.

11 MR. KATZ: Validation.

12 MEMBER BEACH: At 6:18 in the
13 morning.

14 CHAIRMAN ZIEMER: Okay.

15 MR. KATZ: Thank you.

16 MEMBER POSTON: My computer is
17 locked up, and I'm trying to get it unlocked.

18 CHAIRMAN ZIEMER: Okay. Well,
19 would that be agreeable?

20 MEMBER POSTON: If someone could
21 send me a copy of it to my --

22 CHAIRMAN ZIEMER: Are you all

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1 agreeable that we'll look at it, and then we
2 can, if we want to proceed with it, ask him to
3 do it next week? Is that -- Josie, is that --

4 MEMBER BEACH: Yes, that is fine.

5 CHAIRMAN ZIEMER: Okay. So that's
6 what we will do related to Issue 1, which is
7 the source term summary issue.

8 DR. MCKEEL: I have one more
9 comment about Issue 1, if I may.

10 CHAIRMAN ZIEMER: Sure. Please
11 do.

12 DR. MCKEEL: At the last -- this
13 is Dan McKeel, again, for the court reporter.

14 At the last Work Group, I mentioned and you
15 endorsed the idea that it would be very
16 helpful to get the Illinois State Radiation
17 Device registration records.

18 And so between February 2 and
19 March 10, I sent a FOIA to the Illinois
20 Department of Public Health, who were the
21 people for which the original legislation was
22 drafted, and they were named as the repository

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1 of those records, and they said -- wrote back
2 very promptly, within 24 hours, and said that
3 years ago those records had been sent to the
4 Illinois Emergency Management Department, the
5 Nuclear Safety Division.

6 So I then FOIAed that group and
7 spoke to and got an answer, two answers, from
8 their legal department, and then finally on
9 March 10 they said, "Per your recent online
10 FOIA request, the Agency has conducted a
11 search of its files and has found the
12 information attached herein."

13 Basically, what it was -- I can
14 forward this. I would like to -- well, let me
15 make my -- let me tell you what I got, and
16 then I would make my suggestion. I got three
17 pages of a database printout, and on the last
18 page, which is a different format, it's got
19 the facility number for Granite City Works of
20 United States Steel, which was the old General
21 Steel place.

22 It said "Location, GSI" on state,

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1 model, and serial number of one of the two
2 betatrons. It says the last inspection date
3 was April 1, 2009, and then below that it has
4 acquisition date, equipment status, junked,
5 and it says last updated 10/08/1993.

6 So the records are really sort of
7 strange, but it certainly indicates that IEMA
8 did have some radiation records on -- and the
9 equipment is described as application class
10 particle accelerator, so it at least had some
11 information on at least one of the Allis-
12 Chalmers betatrons.

13 I am sure that what needs to
14 happen -- and I'm going to actually ask NIOSH
15 to please do this or the Board to initiate
16 this. I have been getting records from IEMA
17 Nuclear Safety Division for more than five
18 years now for General Steel and for Dow
19 Madison, and they have produced some
20 documents, but I don't believe they've
21 produced all of the documents that I've asked
22 for, and I really have two choices.

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1 One choice is to file an appeal.
2 The last time I did that on one of my FOIAs to
3 IEMA, it took a year to get the appeal
4 answered, which I finally won, but we don't
5 have a year to waste on this, so I'm going to
6 ask. I think the most expeditious thing is I
7 believe that there are crucial radiation
8 device records at IEMA in Illinois.

9 One of the things not mentioned
10 today by David Allen was that the NRC records
11 mention that there were at least two
12 conventional x-ray, industrial x-ray devices
13 in use at GSI, so it certainly is possible we
14 can get more source term information from
15 Illinois Emergency Management, and they should
16 have registration records for all of the
17 sources at General Steel.

18 So the two ways I know to get them
19 are, besides a FOIA appeal, which I think will
20 take too long, will be either to go to IEMA
21 and do a direct data capture, remembering
22 that, you know, there are 19 or 20 covered

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1 sites in the State of Illinois, and that might
2 be very productive for sites other than just
3 General Steel. They might be productive for
4 Dow Madison or any of the other many places in
5 Illinois.

6 The other possibility is to do
7 what I have urged and requested for years, and
8 that is to write Department of Labor a letter
9 and ask them to please invoke the subpoena
10 power to get those records. I believe that
11 although they have been partly cooperative
12 that IEMA is not being fully cooperative, and
13 I just believe that a little firmer action is
14 needed to get the records that they have, and
15 it could be very productive.

16 So that's what I wanted to report.

17 I have at least got some information, but
18 it's not inclusive of all the radiation
19 sources that should have registration records
20 and that we know existed at General Steel
21 during the covered period.

22 CHAIRMAN ZIEMER: Okay.

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1 DR. MCKEEL: Okay?

2 CHAIRMAN ZIEMER: Yes, thanks for
3 that suggestion, too, Dan. So on Issue 1,
4 then, we will -- we have agreed to wait until
5 next week to make a final decision on whether
6 or not additional tasking is needed.

7 In that regard, though, I'm going
8 to ask you again, Dr. McKeel, are you
9 suggesting that there may have been some other
10 sources in the earlier days beyond the radium
11 sources that perhaps the state would have in
12 their registration records that are unknown to
13 us?

14 DR. MCKEEL: Yes. David Allen's
15 report mentions the fact that we have known
16 for a long time from testimony from several of
17 the General Steel workers and one in
18 particular who filed an affidavit to this
19 effect that there was an iridium-192 source
20 used in the 1950s.

21 So that was prior to the cobalt-60
22 licenses, and this gentleman testified that he

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1 used it. Then he went away, I think, to the
2 service and then came back in the fifties a
3 little bit later, and the iridium source was
4 still in use at GSI, and it was clear from him
5 that it was a source that GSI owned.

6 It then was not there, and he
7 stayed on at GSI for a long time, but it was
8 not there in the sixties, so it's possible
9 that that was an additional source besides the
10 two radium-226 sources in the 1950s, and so
11 that information could be at IEMA.

12 CHAIRMAN ZIEMER: Now iridium-192
13 is a byproduct material, and in my mind it
14 therefore could only be there under license.

15 DR. MCKEEL: I agree with you,
16 but, you know, I asked in both of my 2006 and
17 subsequent FOIA that produced NRC 2010-0012
18 about all the -- all the byproduct material
19 licenses that would be held by General Steel
20 from 1952 through plant closure in 1973, and
21 what I got was that 1,016 pages that covered
22 1962 to when the license was terminated,

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1 actually, in January of 1974 after the plant
2 closed.

3 So I've asked. I've asked twice,
4 and, you know, I didn't get any information of
5 any sources. As you said, the radium-226
6 weren't licensed by the NRC.

7 CHAIRMAN ZIEMER: Yes. Is there a
8 --

9 DR. MCKEEL: So that's all I know.

10 CHAIRMAN ZIEMER: Is there a
11 possibility someone with a separate license
12 may have been brought in to do iridium --

13 DR. MCKEEL: No, we know that
14 [identifying information redacted] and St.
15 Louis Testing Company brought other sources
16 over, and John Ramspott had copied them all to
17 me, extensive communications with [identifying
18 information redacted] in person.

19 I've talked to [identifying
20 information redacted] and emailed back and
21 forth about the iridium source, and the
22 iridium source, I believe, from this --

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1 particularly one worker's testimony,
2 definitely was owned by GSI, that it was not
3 owned by St. Louis Testing.

4 CHAIRMAN ZIEMER: Well, it's --

5 DR. MCKEEL: There is no record in
6 those materials that iridium source was
7 licensed from 1962 to '73.

8 CHAIRMAN ZIEMER: Well, I might
9 add one other thing here, and I think there is
10 confusion about the iridium issue because the
11 individual that I interviewed, and I won't
12 give that person's name here, Dan, but I think
13 you know who it is --

14 DR. MCKEEL: Yes. That was a
15 different person.

16 CHAIRMAN ZIEMER: -- relative to
17 the application of the one and one-half times
18 distance issues --

19 DR. MCKEEL: Right.

20 CHAIRMAN ZIEMER: -- when we were
21 trying to get an idea of the source term
22 strength. I was originally talking with him

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1 about the so-called small source, which they
2 identified as being iridium, and he had been -
3 - when I asked him to verify my understanding
4 of the interview, and he had talked about this
5 iridium source, and I believe subsequent to
6 that, after he took my draft response or my
7 draft summary and talked with others, and I'm
8 not sure who he talked to, they had concluded
9 that he was incorrect in identifying what he
10 worked with as being iridium, and he changed
11 it to cobalt.

12 DR. MCKEEL: Well, that's the
13 gentleman you talked to, and I know who that -
14 -

15 CHAIRMAN ZIEMER: Right. All I'm
16 saying is there was some confusion. Clearly,
17 people had some knowledge of an iridium
18 source, but it's not quite clear when and how
19 much it was.

20 DR. MCKEEL: The individual who
21 gave the affidavit about the iridium was one
22 of the isotope licensed people who was there

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1 all during the 1950s, and he -- I agree with
2 you that there has been confusion, but he was
3 quite definite.

4 He was the individual, for
5 instance, who provided the film report, film
6 badge report from four quarters of 1962 that
7 preceded the Landauer film badge thing whose
8 report identified NCC, Nuclear Consultants
9 Corporation, as the provider of that film
10 badge report, and so, you know, he is among
11 the most reliable people that has been
12 interviewed.

13 I don't believe that that
14 gentleman has been interviewed individually.
15 He's still alive. He's still highly helpful,
16 and, you know, he is another person that could
17 be interviewed directly. So that's all I can
18 say about it.

19 CHAIRMAN ZIEMER: Well --

20 DR. MCKEEL: That's as far as I
21 can take it.

22 CHAIRMAN ZIEMER: The other point

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1 I perhaps will make is that even if we are
2 unable to identify through licensee license
3 records exactly whether that was a licensed
4 source or not, I think the scoping process
5 could still and maybe already does encompass
6 those exposures in the sense that if we -- if
7 we made the assumption that the iridium source
8 was there and being used at something
9 comparable to the radium sources in terms of
10 frequency of usage and so on, we could capture
11 that if we don't already. I just think that
12 in general principles, because --

13 DR. MCKEEL: Well, the comment --
14 the comment that I would have is the radium
15 sources, as far as I know, in the description
16 of the -- in the license documents we got, I
17 think they were used in the building -- in the
18 building six facility, the radiography
19 facility, so whereas the iridium-192 could
20 have been used in the same place, I think
21 that's less definite where that was used, but,
22 anyway --

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1 MR. RAMSPOTT: Dr. Ziemer?

2 CHAIRMAN ZIEMER: Yes, sir.

3 MR. RAMSPOTT: It's John Ramspott,
4 if I may.

5 CHAIRMAN ZIEMER: Yes.

6 MR. RAMSPOTT: Dan's point about
7 the six building and the NDT small building
8 being used, I thought the records that Dave
9 Allen was referring to said that was built in
10 '62, so all that time before '62, '53 is
11 really of interest, and the radium sources
12 were -- the radium-226 sources were much
13 earlier sources.

14 CHAIRMAN ZIEMER: Right.

15 MR. RAMSPOTT: We saw renewals, I
16 believe, when they were getting rid of radium-
17 226 and going to cobalt. Radium-226 sources
18 were used much earlier. That would mean
19 another good reason, maybe, to go to the
20 state.

21 CHAIRMAN ZIEMER: Right.

22 MR. RAMSPOTT: Then the gentleman

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1 that you interviewed who was the Safety
2 Officer, he didn't start at General Steel
3 until 1963.

4 CHAIRMAN ZIEMER: Right.

5 MR. RAMSPOTT: So there's a whole
6 ten-year period that he wasn't there, so he
7 couldn't know what sources were there.

8 CHAIRMAN ZIEMER: I understand.
9 Right.

10 MR. RAMSPOTT: That's a pretty
11 valid point.

12 CHAIRMAN ZIEMER: Right. Okay.
13 Thank you.

14 MR. RAMSPOTT: Thank you.

15 CHAIRMAN ZIEMER: Let's look at
16 Issue 2 briefly before we take our lunch
17 break. Issue 2, in our discussion last time,
18 it had to do with the covered period and the
19 fact that DOL had not changed that covered
20 period start date. Dave Allen reported that
21 we had sent -- we being NIOSH -- that the
22 program he sent information about the covered

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1 period to DOL, and I think the question arose
2 as to whether or not they actually got that
3 material, and we had asked that there be some
4 confirmation, that NIOSH confirm with DOL that
5 they have the information that was provided
6 that could impact on when the covered period
7 started, I believe was the issue.

8 MR. ALLEN: Well, verbally, yes,
9 they have it. What I did since then is I put
10 the letter we sent them, along with
11 attachments, on the common drive that the
12 Board has access to, as well as a Federal
13 Express receipt for that letter.

14 CHAIRMAN ZIEMER: That shows that
15 they have received the information, and, Bob,
16 a comment?

17 DR. ANIGSTEIN: I have input on
18 that, and that is I have a -- I don't have it
19 connected to the screen at the moment, but
20 I'll just read it. I downloaded from The New
21 York Times the January 14, 1952 headline, "24
22 Million Volt Betatron Setup, Chicago, January

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1 13."

2 "The Army said today that a 24
3 million volt betatron has been installed at
4 the General Steel Castings Corporation,
5 Granite City, Illinois, for x-raying steel to
6 be used in Army tanks. Betatron is said to be
7 able to penetrate steel castings seven to nine
8 inches in a minute what is being produced --
9 14 by 17 inches from the metal."

10 The point of this is this
11 information from January `52 was widely
12 disseminated, so it is -- it doesn't prove
13 anything, but it's entirely plausible that
14 Mallinckrodt would have known about it and
15 would have taken -- they were -- we know they
16 were doing it in `53. I mean, I admit --

17 CHAIRMAN ZIEMER: Yes, the issue
18 is not whether the betatron was there and in
19 operation. I think the issue is --

20 DR. ANIGSTEIN: No, but it was
21 also widely known.

22 CHAIRMAN ZIEMER: Yes, but the

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1 issue is when the covered period started in
2 terms of the atomic weapons work, which the
3 tanks, Army tanks and stuff --

4 DR. ANIGSTEIN: I understand. I
5 wasn't --

6 CHAIRMAN ZIEMER: Yes. No, no.

7 DR. ANIGSTEIN: -- that here is
8 plausibility that the Mallinckrodt management
9 would have known about this, and why wouldn't
10 this -- if they used it in '53, it's just as
11 likely they used it in '52 is the point.

12 CHAIRMAN ZIEMER: Well, I don't
13 think it's based on likelihood. It's got to
14 be based on evidence that the contract
15 occurred earlier and --

16 MR. ALLEN: Any way you look at
17 it, it's DOL has to --

18 CHAIRMAN ZIEMER: DOL has the
19 information.

20 DR. ANIGSTEIN: Sure.

21 CHAIRMAN ZIEMER: That's what we
22 were confirming, so that was the only thing on

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1 Issue 2 that we had to cover.

2 DR. ANIGSTEIN: Okay.

3 CHAIRMAN ZIEMER: On --

4 DR. MCKEEL: Dr. Ziemer?

5 CHAIRMAN ZIEMER: Yes.

6 DR. MCKEEL: This is Dan McKeel.

7 CHAIRMAN ZIEMER: Yes, Dan.

8 DR. MCKEEL: I have something
9 that's really directly relevant about
10 confirming information that NIOSH has with
11 Department of Labor, and that is I think there
12 may be a larger problem here.

13 I had supplied to some GSI workers
14 a summary of the new information that Mr.
15 Ramspott and I and some of the workers had
16 compiled about General Steel that is not in
17 Appendix BB, and I know we'll be talking about
18 that a little bit later.

19 So I took that, and several of
20 those people had apparently sent letters to
21 Department of Labor with that information
22 asking that their cases be reopened, and I got

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1 a letter on May 3 of this year, which I sent
2 to the Work Group, from Rachel Leiton at
3 DEEOIC.

4 She informed me that whereas that
5 information might be valid, she really wasn't
6 disputing that, but she said in her letter
7 that she had gotten no new -- no information
8 from NIOSH or the Board that was new evidence
9 related to General Steel Industries.

10 Now, actually, in reading this
11 item, which kind of surprised me, and I
12 remembered it now, that would include the
13 request that NIOSH had sent over to Department
14 of Labor about the covered period. So,
15 anyway, what Rachel Leiton said was that she
16 needed written confirmation from NIOSH and/or
17 the Board that new information had been
18 received by them pertinent to General Steel
19 Industries.

20 So, you know, I think this
21 procedure of how Department of Labor is
22 notified needs to be worked through, and my

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1 suggestion would be that rather than depending
2 on placement on the O: drive, which seems to
3 be a problematic, that what's really needed is
4 a letter signed by the Board and/or NIOSH
5 directly to Department of Labor and Rachel
6 Leiton explicitly stating what the new
7 information is and asking for a written
8 response back from her, A, that it's been
9 confirmed that she received it, and, number
10 two, you know, whether Department of Labor
11 agrees to accept that and use that in
12 adjudicating claims.

13 So what the message I got was that
14 all this information that Mr. Ramspott and I
15 and the workers and site experts, people
16 you've interviewed, have been supplying to the
17 Board and to NIOSH for the last five years has
18 not been transmitted to Department of Labor so
19 that it could be used in helping the claims
20 process. That seems to be something that
21 could be easily addressed, and, anyway, I just
22 wanted to give you that input that that seems

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1 to be a big problem that is impeding
2 Department of Labor, at least, acknowledging
3 all the work that we've been doing on General
4 Steel for the last five years.

5 And this item, it's hard to
6 confirm that that information on the covered
7 period has even been confirmed as received by
8 Department of Labor and acted upon is very
9 distressing to me. I mean, this has been
10 going on now for months, and it shouldn't take
11 that long to get it confirmed by letter, so,
12 anyway, that's just a -- that's my comment.

13 CHAIRMAN ZIEMER: Yes, I have a
14 copy of Rachel Leiton's letter, also. I am
15 not sure how widely it was distributed. I
16 understood her comments to mean that they got
17 -- when they said -- when she said they got no
18 new information, that everything that was sent
19 they already had or knew about was how I
20 interpreted that.

21 I may have interpreted that
22 incorrectly, but my understanding is that we

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1 are not relying on things on the O: drive to
2 inform Labor. Labor has -- what was put on
3 the O: drive is a copy of the letter that had
4 already specifically been sent together with a
5 signed receipt showing that the Department of
6 Labor had received the material from NIOSH
7 with the information related to extending the
8 covered period. Dave, am I correct on that?

9 MR. ALLEN: DOL doesn't have
10 access to that drive.

11 CHAIRMAN ZIEMER: DOL doesn't have
12 access to the O: drive in any event. That's
13 our internal thing. The point was that Dave
14 had put it on the O: drive to confirm to us
15 both that the material had been sent to Labor
16 and that they had signed a receipt of having
17 received it.

18 Now, admittedly, we don't know in
19 the bureaucracy. I guess we assume that it's
20 gotten to Rachel, but I don't know if NIOSH
21 folks here or if, you know, Mr. Katz, if you
22 can help us on this. Is there more that -- in

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1 a sense, I don't regard it as a Work Group
2 issue. It might be a Board issue. It's the
3 issue of dealing with another federal agency
4 and making sure that they have the information
5 that's needed to make the decision. I
6 understood from Rachel Leiton's letter that
7 she believed that nothing that was sent was
8 new information to them. I may have --

9 MR. KATZ: Yes, rather -- I think
10 I read it, too, but, you know, I read it among
11 many things a few days ago. I thought her
12 point was that information she received was
13 not dispositive on the issue.

14 So it's not that she didn't
15 receive information that might have been new,
16 even. It's just that DOL's consideration of
17 that information did not find that it was
18 dispositive, in other words, that it would
19 change their determination of the, you know,
20 the covered period.

21 DR. MCKEEL: I agree with Ted that
22 that's what that letter said. It was not

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1 really about the covered period. It was about
2 all of the -- all of the issues that we have
3 worked through with respect to Appendix BB and
4 the SEC.

5 So, anyway, I think she was saying
6 that it was not dispositive, but to me, I
7 mean, we can talk about that under Item 4(d),
8 but that's preposterous that items that
9 directly affect dose reconstruction would not
10 be dispositive with respect to adjudicating
11 claims which are based on dose reconstruction.

12 I mean, that's a logical absurdity
13 to me, but, anyway, I just wanted to mention
14 that if there were a problem, I don't know who
15 should communicate new information, but it
16 seems like it should be communicated.

17 And I would see it the way Ted
18 Katz just said, that she was not disputing
19 that this was important information, just that
20 it was not going to affect the way they
21 adjudicated claims, and I -- but I understood
22 her to be saying until the Board or NIOSH

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1 validated that this information had been, you
2 know, worked through and was now acceptable.
3 And, of course, the real point is where it
4 needs to be added is it needs to be added to a
5 revised TBD -- I mean, to a revised Appendix
6 BB, but we can talk about that later on.

7 CHAIRMAN ZIEMER: Well, let me
8 just comment that I think Labor's decisions
9 are not dependent on what we put in the TBDs
10 or in Site Profiles because those, in fact,
11 are driven in part by what boundaries are put
12 on us by the decisions made by Labor and DOE
13 in those determinations.

14 There already is a practice that
15 NIOSH has. If they discover documents that
16 suggest that the covered period should be
17 different, those don't even necessarily come
18 to the Board. They go -- they notify
19 Department of Labor directly, and that is a
20 regular practice.

21 It's my understanding that if
22 documents surface that suggest that the

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1 covered period should be extended in some way,
2 those documents -- that documentation is made
3 known at once to Department of Labor, so there
4 is no requirement. In fact, it's not a
5 practice that the Board has to agree that a
6 covered period should be changed. That's --

7 DR. MCKEEL: My letter had nothing
8 to do with the covered period. It had to do
9 with Appendix BB-related issues.

10 CHAIRMAN ZIEMER: Per se, yes, but
11 we did have the --

12 DR. MCKEEL: I understand what
13 you're saying.

14 CHAIRMAN ZIEMER: Yes, this
15 particular thing, we wanted to confirm that --

16 DR. MCKEEL: Yes, sir. I agree.

17 CHAIRMAN ZIEMER: -- that, that
18 Labor had gotten that information.

19 DR. MCKEEL: All right. I agree,
20 and thank you for the explanation.

21 CHAIRMAN ZIEMER: I think it's
22 time for our lunch break now, so we'll break.

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1 I think an hour is enough for lunch, and
2 we'll come back promptly at 1:00 and resume
3 our deliberation.

4 MR. KATZ: Thank you. Thank
5 everyone on the phone, and we'll reconnect at
6 1:00.

7 (Whereupon, the above-entitled
8 matter went off the record at 12:03 p.m. and
9 resumed at 1:08 p.m.)

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A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

1:08 p.m.

MR. KATZ: So welcome back, everyone, to the Advisory Board of Radiation and Worker Health, the TBD-6000 Work Group. We're just reconvening after lunch.

Let's just check on the line to see -- Henry Anderson, Dr. Anderson, do we have you with us again?

(No response.)

MR. KATZ: And how about the petitioner and site expert?

DR. MCKEEL: I'm here. This is Dan McKeel.

MR. RAMSPOTT: I'm here. This is John Ramspott.

MR. KATZ: Welcome back.

CHAIRMAN ZIEMER: Okay, I think we're ready to proceed. My notes on issues 3 to 11 of Appendix BB was to ask the question

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1 of what will the impact of the new issue 1
2 information have on these issues.

3 Let me review for you what issues
4 3 to 11 deal with and then I'll ask Dave Allen
5 for a very general response because we may
6 need to get some specificity.

7 Issue 3 had to do with the under-
8 estimate of beta beam intensity.

9 Incidentally, let me insert here
10 that before -- I'm not sure we had all the
11 NIOSH responses to all of these, but they were
12 related to source term information that now
13 may have changed somewhat, so the responses
14 may change.

15 Issue 4 had to do with an
16 underestimate of stray radiation from the
17 betatron. Now, the betatron source term hasn't
18 changed, so that issue may not change for you
19 unless there was something in the surveys that
20 changed that.

21 MR. ALLEN: Well, there's been
22 several pieces of information that he wants us

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1 to --

2 CHAIRMAN ZIEMER: That have come up
3 since so -- okay.

4 MR. ALLEN: One batch.

5 CHAIRMAN ZIEMER: Right, okay so,
6 anyway that's what issue 4 had to do with.

7 Issue 5 had failure to assess
8 other radiography sources. Well, in part, or
9 maybe in full, that's at least addressed by
10 the new source term information.

11 Neglect of skin dose from
12 activated steel was the next one.

13 The seventh one was an
14 underestimate of exposure to activated
15 betatron apparatus.

16 And, Number 8 was underestimate of
17 work hours. That was the 40-hour week versus
18 the 60. The ninth one had to do with mis-
19 characterization of steel work practices.
20 Issue 10 had to do with errors in calculating
21 dose rates from uranium. And, Issue 11 dealt
22 with underestimate of doses to other workers.

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1 So all of those things are the
2 items that we said last time we need to know
3 what the impact of the new information would
4 have on those outcomes.

5 Now, at the time of our last
6 meeting, we were aware of this new set of
7 documents that have been discovered by the
8 petitioner, but we weren't aware of the impact
9 they would have on these other items.

10 So we do need to -- and I'm not
11 thinking we would do that today -- but I think
12 we need to know if anything has changed in
13 those matrix items with this new information.

14 MR. ALLEN: I think some has --
15 very aware that the source --

16 CHAIRMAN ZIEMER: Right.

17 MR. ALLEN: Isotopic sources, some
18 White Papers describe all that information.
19 There's also some information on the betatron
20 building site.

21 CHAIRMAN ZIEMER: Right.

22 MR. ALLEN: The drawings we were

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1 relying on before came from photographic
2 surveys.

3 CHAIRMAN ZIEMER: Right. We have
4 those other drawings now, too.

5 MR. ALLEN: Now we have drawings
6 that dimension them.

7 CHAIRMAN ZIEMER: Right.

8 MR. ALLEN: Also some shielding
9 wall in the new betatron building on those
10 drawings that was not in the FUSRAP surveys.
11 I don't know if that was just omitted as not
12 necessary or if that wall disappeared before
13 1990 when they did the survey. I simply don't
14 know, but there is a thicker concrete wall.

15 CHAIRMAN ZIEMER: Back up a little
16 bit. There's a big difference between the old
17 betatron building and the new betatron
18 building so much in the --

19 MR. ALLEN: Right.

20 CHAIRMAN ZIEMER: It extends in the
21 upward corridor in the old building and it
22 stops pretty much at the shielding room on the

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1 new betatron building.

2 These drawings show the ten-foot
3 thick wall stops there but then there's a
4 concrete wall bearing thickness as it turns
5 the corner and the thickness goes to four
6 feet.

7 MR. ALLEN: I believe our reaction
8 last time was that any or all of these items
9 might change with the new information.

10 CHAIRMAN ZIEMER: Yes.

11 MR. ALLEN: So what I'd like to
12 suggest if it's agreeable to the Work Group is
13 that we ask NIOSH to now go back to their
14 previous responses and make whatever
15 modifications need to be made on these issues
16 so that we -- because we want to close them in
17 terms of current information. We don't want to
18 deal with them based on old information which
19 is no longer pertinent.

20 If you say this item -- this issue
21 doesn't change because of something other than
22 -- fine, then we proceed.

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1 But I think in terms of our own time and being
2 systematic on this, if we could go back to
3 each of those and see what the response is now
4 that you have the new service information.
5 Would that be appropriate?

6 CHAIRMAN ZIEMER: Yes, I think we
7 can do that.

8 MR. ALLEN: I was going to say that
9 there's been so much new information between
10 film badges to NRC documents and --

11 CHAIRMAN ZIEMER: Right.

12 MR. ALLEN: And new information
13 from workers.

14 CHAIRMAN ZIEMER: Well, your
15 responses might have changed substantially
16 from the finding. I think the finding may
17 still be appropriate to address, but the
18 answers might be very different now.

19 MR. ALLEN: Yes. Some of those
20 findings might be moot now.

21 CHAIRMAN ZIEMER: They may be moot
22 and that's fine too.

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1 MR. ALLEN: I mean, they might --
2 the solution might raise --

3 CHAIRMAN ZIEMER: Right, right. So
4 I think it's appropriate to systematically go
5 through each of those original findings and
6 indicate how you would answer them in terms of
7 the current information.

8 So that would be our
9 recommendation, I think, to NIOSH. We don't
10 task them, but we certainly can -- we're
11 certainly aware that the response to the
12 matrix has to have changed in some respects
13 with regard to the new source term-related
14 information.

15 Any other questions on items 3
16 through 11?

17 DR. MAURO: Excuse me, Paul? When
18 you make reference to that, do you include
19 some of the analysis that we provide in our
20 report because our findings, you know, we've
21 sort of laid out a lot of places where
22 assumptions made -- these assumptions, those

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1 assumptions -- in other words, where we laid
2 out alternative approaches that may be
3 considered -- have new distances in occupancy
4 times and number of shots.

5 I mean, in other words, what I'm
6 getting at is that there's new information
7 that Dan McKeel, of course, has been
8 providing. There is information that we
9 provided by way of our own analysis in the
10 situation. So there is really a fairly long
11 collection --

12 CHAIRMAN ZIEMER: Well, they have
13 all of that.

14 DR. MAURO: And they have all --
15 but that's where you're going with it?

16 CHAIRMAN ZIEMER: Yes, yes.

17 DR. MAURO: Okay. It's the whole --

18 CHAIRMAN ZIEMER: Sure. Yes, yes.

19 DR. MAURO: Okay.

20 CHAIRMAN ZIEMER: So issues 3
21 through 11 need to be addressed in terms of
22 the current status of the information.

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1 Issue 12 was the contamination-
2 resuspension issue, which is sort of the same
3 issue as we had in TBD-6000 itself. So that's
4 one that goes back to the original transfer to
5 the other -- to the Subcommittee. Well, it's
6 the same issue, I think.

7 MEMBER MUNN: It is. Yes, I think
8 it is.

9 CHAIRMAN ZIEMER: Right.

10 MEMBER MUNN: It certainly appears
11 to be at this point.

12 CHAIRMAN ZIEMER: Issue 13 was use
13 of incorrect units. I'm not sure if that's an
14 important issue in terms of dose
15 reconstruction because we know that all the
16 reports always talked about dose in roentgens
17 and roentgen is not a dose unit. It's an
18 exposure unit. Rads and rems came along
19 later.

20 It's a technical-clarity issue,
21 but for example, if you're reporting on what
22 an old report said and you know the roentgens,

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1 that's how you report it.

2 If you wanted to be up to date, we
3 got to get into sieverts and grays and so on.

4 Anyway, there's some other things
5 there that talked about air kerma and
6 millirads and so on. But these are sort of
7 technical edits that can be made as needed, I
8 think.

9 I don't think the Work Group needs
10 to deal with that, per se, except that --

11 MEMBER MUNN: NIOSH has accepted it
12 and said they'll change it in the future and
13 they haven't, so --

14 CHAIRMAN ZIEMER: Right.

15 DR. ANIGSTEIN: The issue is,
16 besides technical correctness is also that if
17 they use the OCAS 1, there's a different dose-
18 conversion factor.

19 Basically, it ends up with dose to
20 a given organ. That's the final analysis.

21 CHAIRMAN ZIEMER: Right.

22 DR. ANIGSTEIN: There are different

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1 dose-conversion factors for exposure and for
2 HD10 and for, I believe there's also one for
3 effective dose. Both reconstructors need to
4 know which of these three tables to use.

5 CHAIRMAN ZIEMER: Is that
6 something, maybe, to be clarified -- I don't
7 recall the details on that -- was there
8 uncertainty as to which table --

9 DR. NETON: I think what Bob's
10 pointing out is that, aside from the fact that
11 we need identifiable -- really, what we mean -
12 - it's important to identify what it really is
13 because dose reconstructors may rely on that
14 unit to do a conversion. External -- That's
15 based on the ICR.

16 Whether you're converting from an
17 exposure measurement in here to an organ dose
18 or -- it makes a big difference.

19 CHAIRMAN ZIEMER: Right.

20 DR. NETON: Some difference.

21 DR. MAURO: It's a -- I would say
22 it's a marginal issue compared to these other

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1 matters.

2 DR. NETON: I think we acknowledged
3 it.

4 CHAIRMAN ZIEMER: Right.

5 MEMBER MUNN: But its use, then, in
6 dose reconstruction would seem to place
7 additional priority on getting at least that
8 portion of appendix revision done, would it
9 not?

10 DR. NETON: I'm not certain that --
11 even though the text might indicate that, I
12 think that where the rubber meets the road,
13 dose reconstructors -- I expect they're using
14 the right conversions.

15 CHAIRMAN ZIEMER: Well, all we need
16 then is to point out what is done in practice
17 aside from the terms in the Appendix itself to
18 give assurance that the correct conversions
19 are being used in the dose reconstruction
20 process.

21 MEMBER MUNN: Perhaps we could add
22 that to the NIOSH response.

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1 CHAIRMAN ZIEMER: Right.

2 DR. ANIGSTEIN: That meeting is not
3 accessible on disk. In the actual standards,
4 there are places MCNP was used to calculate
5 rads that other places where roentgen were
6 calculated.

7 So there were -- it's not just the
8 same -- okay, translated -- there are changes,
9 because there actually were mixed units in the
10 analyses themselves and not just in the write-
11 up.

12 So there needs to be a little --
13 it's not a major job, but there needs to be a
14 little work done to unify that.

15 CHAIRMAN ZIEMER: Okay. I want to
16 move on to item D, which is the petitioner's
17 document. The title of that document is
18 Reasons the TBD-6000 Work Group Should
19 Recommend an SEC for GSI and Appendix BB and
20 TBD-6000 Needs to be Revised by NIOSH.

21 So if you will pull that out. What
22 I would like to do is the following -- Dr.

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1 McKeel has numbered the items. I believe there
2 are 13 of those items, the first of which
3 we've actually already discussed. That was on
4 TBD-6000. I think we've discussed that one
5 already.

6 But starting with item 2 on
7 through and what I would propose doing is --
8 over the weekend, I developed some comments of
9 my own and I want to share those with you.

10 My comments are intended -- I'm
11 not suggesting what the Work Group's positions
12 should be so much as trying to
13 stimulate your thoughts on these items. Feel
14 free to shoot down whatever I say. These are
15 just some discussion points.

16 We'll allow the petitioner also to
17 add to or respond to what I will characterize
18 as my sort of initial responses to the items.

19 One, you're looking like you're
20 having trouble finding the documents.

21 MEMBER MUNN: Yes, I am. The date
22 of this?

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1 CHAIRMAN ZIEMER: I think Dr.
2 McKeel distributed this.

3 MEMBER MUNN: Oh, in your red and
4 white?

5 CHAIRMAN ZIEMER: The red and
6 white.

7 MEMBER MUNN: Got it.

8 CHAIRMAN ZIEMER: Dr. McKeel's
9 document -- you have the original copy there?

10 Okay, so it cites specific Appendix BB items
11 is where I'm starting. In his item 2 on the
12 unresolved SC&A findings on Appendix BB and so
13 on, the comment says that collection of SC&A
14 analysis was a GSI external radiation doses
15 have been grossly underestimated by NIOSH.

16 This comment includes, via
17 reference, all of the GSI SEC00105 co-
18 petitioner McKeel's previous public comments
19 at Board meetings in the TBD-6000 Work Group
20 transcripts. This formal critique posted on
21 the OCAS web site and comments to NIOSH
22 thereon.

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1 My initial comment is, 1) the Work
2 Group has not specifically agreed to or
3 accepted the SC&A analysis or assertions that
4 the external doses have been grossly
5 underestimated.

6 Just as a starting point, we have
7 not agreed -- nor have we disagreed -- but we
8 have not agreed with that position
9 necessarily.

10 Of course, NIOSH now has provided
11 -- updated the external dose reconstruction
12 figures based on this new source term
13 information that's been provided.

14 So in my mind, what would need to
15 happen and what we might decide to do next
16 week is for SC&A to re-evaluate these
17 recommendations in this NIOSH White Paper and
18 perhaps critique that, because I don't know if
19 SC&A's comments are still the way they're
20 characterized here or not as the dose is being
21 grossly underestimated and so on. That's my
22 initial comment on that.

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1 John, you --

2 DR. MAURO: Yes. You said a couple
3 of things that sort of compounded together in
4 what you just described.

5 There's a number of comments we
6 have that go back to our original review of
7 the work done on Appendix BB and there is a
8 lot of discussion we reviewed that errors were
9 made, assumptions would be different, and that
10 sort of thing.

11 Then of course, there is the
12 recent report that just came out dealing with
13 external exposures from sources, which is
14 really new information on dealing with this
15 new matter of how we're going to deal with --
16 now, I see that as separate.

17 In other words, that's a stand-
18 alone issue and as I understand it, we decided
19 in Buffalo to do anything on that. Is that
20 right? Do we have an official green light?

21 CHAIRMAN ZIEMER: Yes.

22 DR. MAURO: I guess what this --

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1 all these other matters deal with basically
2 Bob's comments on language -- you know, the
3 betatron model was run and all those
4 assumptions. I guess I'm not quite sure. Is
5 there anything else you need from us related
6 to that?

7 I mean, that's now on the record.
8 I don't know if there's anything that we said
9 that changes, in light of everything we've
10 learned --

11 DR. ANIGSTEIN: No. I'd like to
12 just interject.

13 DR. MAURO: Sure, please.

14 DR. ANIGSTEIN: I don't know if
15 it's clear and I doubt if it's clear to
16 everyone, the purpose of the report that we
17 issued back in the uncleared version in March
18 and the cleared version in April of 2008 was
19 not to say we have the answer.

20 This is the way the betatron
21 upgraded 100 percent of the time and
22 therefore, we can use all of this as the

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1 calculated doses.

2 The purpose was to show, here are
3 some scenarios that NIOSH overlooked of the
4 betatron shooting the casting of the railroad
5 tracks of the exposure in the restroom, which
6 was -- actually, there wasn't one condition
7 under which you could draw a straight line
8 from the corner of the restroom to the bigger
9 target with nothing being in between except
10 some light sheet metal and light concrete.

11 True, it was not the correct beam.
12 It would be a different number of the beam,
13 but nevertheless, there would be -- so these
14 were examples of things that should be looked
15 at.

16 We didn't say this is always the
17 case. We also didn't say that these are the
18 worst conditions. We didn't look at every
19 single possible geometry. We're so limited by
20 time. These summaries run very long.

21 So I could imagine intuitively
22 that there could have been worse geometry.

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1 For instance, we had the beam being horizontal
2 -- pointed horizontal at this large round
3 casting, length of a shovel. The beam could
4 have been underneath pointing up at a 45 -- I
5 was told it never points straight up. It could
6 be at a 45-degree angle. It would have to be
7 to get all the -- as a matter of fact, I have
8 a picture of that here.

9 We have to get this thing -- Jim,
10 you seem to be the expert on this -- how to
11 get this thing started. At least, Dave said
12 you are.

13 DR. NETON: Turn it on.

14 DR. ANIGSTEIN: It's on, but I have
15 no idea how to activate it -- how to get the
16 projector to talk to the laptop.

17 CHAIRMAN ZIEMER: You may have to
18 push F7 or F8 button to -- F7 or F8 usually
19 sends the signal.

20 DR. ANIGSTEIN: I think it's
21 function F8.

22 DR. NETON: You've got to get the

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1 light working. The light is not on. I just
2 turned it on.

3 DR. ANIGSTEIN: Okay, now this --

4 CHAIRMAN ZIEMER: For those on the
5 phone, Bob is starting to show us a picture
6 here which you'll be familiar with, but we
7 don't -- a big shot, Bob, of what?

8 DR. ANIGSTEIN: Let me get it.
9 There we go.

10 CHAIRMAN ZIEMER: We all have
11 pictures of this ourselves.

12 DR. ANIGSTEIN: This is in the SC&A
13 report, Figure 19.

14 CHAIRMAN ZIEMER: Right.

15 DR. ANIGSTEIN: So I just made a
16 copy here. I did it for a different -- I mean,
17 I had to key up for a different reason, but as
18 long as we're at it, what it shows is they're
19 going to need to take from different angles.

20 You're going to have to put a film
21 inside here and so it's got to be shooting --
22 in our model, we're shooting horizontal.

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1 We're also going to have to shoot
2 up like this because I don't think we're going
3 to get all the different pieces of it.

4 So I'm just saying that there are
5 many, many situations -- and we only picked a
6 couple as not necessarily worst case, not
7 average case -- just an example of something
8 that was not included in the original.

9 We did so to say, well, our
10 estimate is 13.6 per year and imagine the
11 estimate is lower. That's assuming this would
12 be 100 percent of the time and we don't claim
13 it is.

14 CHAIRMAN ZIEMER: Well, I think the
15 overall thrust -- and Dan can clarify -- the
16 overall thrust of the second comment here is
17 not specifically on that one issue, but it was
18 in general that we need resolution on all of
19 the SC&A findings in Appendix BB. That's
20 number one.

21 And oh, by the way, many of the
22 estimates of SC&A seem to be higher than

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1 NIOSH, so there was that discrepancy that was
2 pointed out.

3 But I think Dr. McKeel, I believe,
4 is emphasizing the need to resolve these items
5 that are in the matrix and I think we agreed
6 to that. NIOSH has agreed that they're going
7 to come back with new information, certainly
8 on items 3 through 11, which are the bulk of
9 these, so we will have that new information.

10 But let me pause and ask Dr.
11 McKeel if I have understood his comment
12 correctly?

13 DR. MCKEEL: Hi, Dr. Ziemer. This
14 is Dan McKeel.

15 Yes, you've got it exactly right.
16 I wasn't making any specific point other than
17 there were some really serious findings that
18 need to be resolved.

19 They all need to be resolved and
20 then Appendix B can move on. The corollary of
21 that and the concern is that once those things
22 are resolved, then Appendix BB desperately

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1 needs to be revised, so exactly right.

2 CHAIRMAN ZIEMER: Okay, thank you.

3 Let's move on to the third item,
4 which was unresolved SC&A findings for the SEC
5 00105 Evaluation Report.

6 Dr. McKeel points out that the
7 findings included review of two GSI cases with
8 major technical errors. These cases were
9 important to the Dose Reconstruction
10 Subcommittee and he points out he's got no
11 results of that referral.

12 And then it says one major finding
13 by SC&A was that NIOSH methods on all of those
14 reconstruction were scientifically flawed.
15 This finding, in and of itself, is sufficient
16 for the TBD-6000 Work Group and full Board to
17 recommend overturning NIOSH's recommendation
18 to deny 00105 in recommending SEC.

19 My initial comment is that neither
20 this Work Group nor the Board has so far
21 agreed that the NIOSH methods are all
22 scientifically flawed.

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1 The fact that -- I'm not sure --
2 Dr. McKeel, you can clarify in a moment -- I'm
3 not sure if you were talking about just the
4 dose reconstruction from General Steel or all
5 dose reconstruction.

6 But I did want to note that it's
7 very common in dose reconstruction cases and
8 cases reviewed by our contractor, SC&A, to
9 find what I would call technical issues or
10 what we call findings in terms of our
11 evaluation process or the Board's evaluation
12 process of dose reconstruction.

13 In most of the cases reviewed to
14 date, these technical errors have not risen to
15 the level where there would be a change in the
16 compensation decision.

17 I believe that in the few cases
18 where perhaps it was identified that it could
19 affect the compensation decision, the burden
20 is on NIOSH to address the individual case,
21 not on the Work Group.

22 And the Board doesn't review the

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1 individual cases per se -- for example, what
2 you might call appeal. That's my initial
3 comment on that.

4 Maybe I'll ask Dr. McKeel, though,
5 to clarify. When you talked about all cases
6 being flawed, were you referring to all dose
7 reconstructions or specifically to General
8 Steel?

9 DR. MCKEEL: Dr. Ziemer, this is
10 Dan McKeel. There is a finding in a particular
11 -- I think the last time that I addressed the
12 Board about that, that entered the record
13 specifically.

14 SC&A was referring to -- I believe
15 the term they used was all GSI dose
16 reconstructions done to date.

17 I've read an awful lot of SEC
18 evaluation reports and I cannot remember ever
19 hearing a statement that strong. So my point
20 was that as a departure point, Dr. Anigstein
21 picked two cases that illustrated SC&A's
22 problem with the way dose reconstruction had

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1 been performed.

2 Of course, I understand that the
3 Board has not made a final determination and
4 that's why Items 2 and 3 start off with
5 unresolved findings.

6 But what my point was is that I
7 understand very well that rarely have your
8 dose reconstruction reviews resulted in a
9 change to the Probability of Causation toward
10 compensation and so forth. And here were two
11 cases that were so troublesome -- and it is
12 clear that they were troublesome, at least to
13 SC&A, who went on for several pages describing
14 what was wrong specifically, and those two
15 cases have not really been examined yet. They
16 haven't been defended by NIOSH and they really
17 haven't been scrutinized by the Board.

18 So I felt that one possibility
19 might be, besides any other deliberation,
20 would be to bring those two cases to the
21 attention of the Dose Reconstruction
22 Subcommittee and perhaps, since those cases

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1 are not a random sample, but are two cases
2 that are singled out by SC&A as having major
3 problems that -- that might be two cases that
4 could be recommended.

5 The rest of that comment speaks of
6 another person who contacted me recently who
7 is from GSI whose Probability of Causation was
8 49.14 percent with lung cancer and is in there
9 the entire covered period.

10 So I was merely suggesting that
11 that would be another case that would be
12 excellent to have dose reconstruction done.
13 That may be a perfectly appropriate
14 Probability of Causation, but I'm just trying
15 to make the work of the Dose Reconstruction
16 Subcommittee examine cases that are, number
17 one, really close to the compensation line
18 because our contention -- I'm talking about
19 petitioners, the advocates, the workers, the
20 claimants from GSI -- is that they're a very
21 large number of pieces of new information,
22 including the average work week change, that

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1 need to be incorporated in dose
2 reconstruction. We're not clear that they have
3 been. Certainly, Appendix BB has never been
4 revised.

5 So that was the point of trying to
6 flag those cases. That's all.

7 CHAIRMAN ZIEMER: Okay, that's
8 helpful. Ted Katz has a comment.

9 MR. KATZ: A couple things related
10 to his request about the Dose Reconstruction
11 Subcommittee, for one.

12 Can I ask -- someone on the line
13 is washing dishes or something and if you
14 could put your phone on mute. It's not
15 impossible for us to make out what Dan is
16 saying, but it might be worse for other people
17 on the phone.

18 The cases, I believe, that are
19 referred to are cases that are anted up for
20 the Dose Reconstruction Subcommittee to
21 review. There's a process by which they go
22 about that.

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1 They review those in sets and they
2 are pretty far along now because the twelfth
3 set, which is -- right -- the most current,
4 has already been assigned for a sort of
5 further investigatory process that goes on
6 between SC&A and Board members. So those are
7 pretty far along, but those are in process.
8 Those would be in process then for having sort
9 of a final evaluation ready for the Board to
10 consider with respect to those cases, right?

11 MEMBER GRIFFON: You're saying if -
12 -

13 MR. KATZ: The particular cases
14 that he mentioned are ones that SC&A reviewed
15 as part of the dose reconstruction review
16 process. That's my point.

17 MEMBER GRIFFON: I didn't know
18 that.

19 MR. KATZ: So Dan, that will -- in
20 the normal course of business, those cases
21 will be sort of fully evaluated by the
22 subcommittee.

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1 DR. MCKEEL: Ted, I -- this is Dan
2 McKeel again.

3 I appreciate your efforts in
4 flagging those cases and identifying that they
5 were already an existing set.

6 What I was trying to say in this
7 comment about the SEC is that I think it's
8 extremely important that, once they are
9 reviewed, that that information be fed back to
10 this particular Work Group to consider along
11 with their own deliberations on those two
12 cases, which I assume in time will be examined
13 and looked at.

14 MR. KATZ: Right.

15 DR. MCKEEL: That's really what I
16 was trying to do was to make that connection
17 between those two cases.

18 MR. KATZ: Right. Thanks, Dan. I
19 think that's easy to do, but Mark Griffon is
20 actually the chair of that subcommittee that
21 does the dose reconstruction reviews.

22 DR. MCKEEL: All right, thank you.

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1 MR. KATZ: Though he sits on this
2 one.

3 CHAIRMAN ZIEMER: This is Ziemer
4 again. I want to sort of emphasize something
5 in terms of our own internal procedures
6 recognizing you already have -- these cases
7 have been reviewed before and all that SC&A
8 had done was gone back and said have we
9 reviewed some GSI cases in the past and what
10 were our comments on those?

11 So those do automatically get
12 resolved in the system and the Work Group,
13 that is, the Subcommittee, the Dose
14 Reconstruction Subcommittee, is reviewing
15 those as part of their normal review process.

16 If they find that procedurally,
17 there's something in error because there's a
18 resolution process there too -- if the doses
19 were reconstructed in error, those get taken
20 care of by NIOSH through a feedback process.

21 If it's found that there's
22 information -- something has changed that

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1 should have been considered -- maybe a
2 shortcoming in, let's say, Appendix BB, that
3 information could be fed back.

4 The other part of it is, if
5 Appendix BB changes and there's a new work
6 week or number of hours used or there's a
7 change in other parameters, all previous dose
8 reconstruction done under the old system would
9 get re-evaluated to determine whether or not
10 any new findings affect the Probability of
11 Causation, so that's all part of the process.

12 The main thing I wanted to
13 emphasize, particularly on a specific case
14 that you mentioned and I'm not going to give
15 either the DOL file number or the person's
16 name, but it's mentioned in your document,
17 Dan. You understand that neither this group,
18 nor the Dose Reconstruction Subcommittee, nor
19 the Board -- we are not an appeals committee
20 and would not look at that case as a specific
21 case.

22 What we would do would be if,

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1 let's say procedures or other information that
2 fed into the dose reconstruction for those
3 kinds of cases changed how dose reconstruction
4 is done, then all of those cases -- and we
5 would not pick out a case to go back to the
6 Board and say this person we think you should
7 redo. We wouldn't tell NIOSH that. They would
8 redo all cases that had been previously
9 considered whether or not they're close to 50
10 percent or whether they're -- well, we don't
11 know -- whatever they are.

12 So the Work Group can certainly
13 make recommendations on any issue that affects
14 dose reconstruction. For example, should a
15 different work week length be considered?
16 Should a different source term be considered?
17 Should the Putzier effect be considered? All
18 of these things that might affect these -- so
19 we have to approach it in a generic way.

20 I think you understand that, Dr.
21 McKeel. We won't review that specific case. I
22 don't even know if that's one of the cases

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1 that's reviewed and we couldn't reveal that
2 anyway.

3 In any event, we will -- this
4 Board will not review that particular case as
5 a specific case. I believe that's correct from
6 a legal point of view and I'll ask counsel if
7 I'm not correct on that. We cannot take action
8 on that specific case as an individual case.
9 We would address all of these as GSI dose
10 reconstruction cases.

11 DR. MCKEEL: Dr. Ziemer, this is
12 Dan McKeel. I definitely understand all the
13 things you just said.

14 However, about that last case --
15 and I understand that you're not an appeals
16 board, you don't adjudicate individual cases.
17 On the other hand, what you do do, is somebody
18 has a list, a pool of candidate cases for the
19 Dose Reconstruction Subcommittee, and out of
20 those you do pick them. I've heard many of
21 those discussions.

22 For example, cases -- if I were

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1 doing that, if I were in your position, I
2 would be extremely interested in looking at a
3 case that came that close to the Probability
4 of Causation of a person who has lung cancer,
5 which is a highly compensated cancer and who
6 is at the work site for 30 years, knowing the
7 fact that 30 percent of the people there have
8 already gotten compensated on dose
9 reconstruction.

10 So just as a Board member or a
11 Subcommittee member, I might wonder how come
12 this person wasn't compensated?

13 CHAIRMAN ZIEMER: You're quite
14 right there and in fact --

15 DR. MCKEEL: That's the only reason
16 I flagged that -- that there was a
17 constellation of findings that, a priori,
18 which I understand is not the way the process
19 is done -- you might think that person would
20 be compensated. That's all.

21 CHAIRMAN ZIEMER: Yes, you're quite
22 right. In fact, you'll notice in the more

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1 recent selections a fair amount of attention
2 to cases -- Mark, you can maybe speak to this
3 -- but cases that are very close but under 50
4 percent, there has been an intentional
5 selection of many of those.

6 We obviously can't do 100 percent
7 of them, but we do try to both find cases that
8 are very close to 50 percent and cases from a
9 variety of facilities to ask the very question
10 you're asking.

11 So indeed there is some intention
12 in that regard. Again, at that point, we're
13 looking at them, without identification of --
14 we do identify by site and by Probability of
15 Causation and type of cancer, so we have that
16 information, but not by individual names.

17 But you're quite right. If you
18 are a Board member, you would do that. If we
19 were Board members, and we are, we would do
20 that and we do and we are, so your point is
21 well made.

22 DR. MCKEEL: Thank you.

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1 CHAIRMAN ZIEMER: A comment --
2 Wanda?

3 MEMBER MUNN: One other comment
4 that perhaps should be made very clear. Even
5 if the case that's being discussed
6 specifically here were to be among those that
7 we were reviewing in dose reconstruction and
8 if there were, in fact, as a result of any
9 information that came forward re-calculations
10 on groups by NIOSH, it is -- this Board would
11 not be advising advocacy groups of the fact
12 that that had occurred -- only the claimant
13 would occur.

14 CHAIRMAN ZIEMER: Yes. In fact, we
15 would not necessarily know that that had
16 occurred.

17 MEMBER MUNN: Precisely. There was
18 an exchange earlier during this conversation
19 where I believe I heard a request that if this
20 case or those like it were reviewed, that the
21 advocate be made aware that they had been.

22 I just want to make it very clear

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1 that it's not possible for us to do that. It
2 would not be done. The claimant would be
3 advised.

4 DR. MCKEEL: This Dan McKeel. No,
5 that's not what I was asking because I
6 understand that that cannot be done.

7 What I was saying was however,
8 that it does -- that if it's possible, it
9 would be useful if the Work Group -- these two
10 cases have been singled out in an SEC
11 evaluation report as having extremely flawed
12 methodology. SC&A pointed that out.

13 It seems to me that that finding
14 on these two cases needs to be resolved. It
15 seems to me that one piece of data that would
16 help resolve that would be if the Work Group -
17 - now I'm talking about could be privy in a
18 generic sense or whatever sense, without
19 knowing the person's name -- that's immaterial
20 -- or their identifying information. That's
21 immaterial.

22 But if they could be -- if they

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1 could learn the purpose of the Dose
2 Reconstruction Subcommittee review, that would
3 be extremely helpful and I am aware of the
4 long discussions you all have had of
5 justifying to the HHS Secretary exactly what
6 the utility of those dose reconstruction
7 reviews is.

8 It seems to me that one of the
9 utilities is certainly to -- I mean, the main
10 purpose is a quality-control measure.

11 So if your contractor picks two
12 cases, from what Dr. Ziemer said if I
13 understand it correctly, if those two cases
14 have already been examined by the Dose
15 Reconstruction Committee and they were found
16 not to have a problem and then SC&A reviews
17 them for another purpose and says there are
18 major problems, then that's an internal
19 quality-control problem.

20 Anyway, look, I'm not trying to
21 tell you all how to do your job. I'm just
22 flagging those two cases. I would notice the

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1 petitioner that I'm not aware that those two
2 cases have been ever discussed at the Work
3 Group level and a very simple thing I was
4 trying to do was to point out that that is a
5 finding on the SEC and that I'm hoping that
6 that will be looked at and resolved. That is
7 all.

8 CHAIRMAN ZIEMER: Yes. Dan, let me
9 clarify because you may have misunderstood.
10 These cases were never approved in advance by
11 the Dose Reconstruction Committee.

12 These cases were done by NIOSH and
13 the claims were closed. It's after that that
14 we review. We review closed claims. All of the
15 claims that we look at in the Dose
16 Reconstruction Subcommittee are cases that
17 have come to closure. They've gone back to DOL
18 and the case has either been awarded or
19 denied.

20 DR. MCKEEL: I understand that.

21 CHAIRMAN ZIEMER: So we never
22 looked at it. So the findings of SC&A are part

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1 of our review of those, so if these are not
2 claims that the Board has said are -- that
3 meet muster and have later been reviewed and
4 found not to be. This is our first look at
5 those.

6 DR. MCKEEL: Okay.

7 CHAIRMAN ZIEMER: With the help of
8 our contractors.

9 DR. MCKEEL: That's fine.

10 CHAIRMAN ZIEMER: And, in fact, now
11 it is the Dose Reconstruction Subcommittee's
12 job to take that information and either say,
13 no, wait a minute. You're wrong and here's why
14 or, yes, you're right and we agree. If there's
15 an issue, that feeds back into the system.

16 It may either have to cause a
17 change by how the dose reconstructions are
18 done. I mean, they could be something as
19 simple as a miscalculation by a reconstructor
20 or it could be something that's flawed in the
21 whole process.

22 As you indicated, maybe, if it's

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1 something like the Appendix that's relied on
2 for dose reconstruction in these cases needs
3 to revised and that feeds back to us, so
4 there's an opportunity now for the Dose
5 Reconstruction Subcommittee to feed the
6 findings back.

7 So indeed, what you're talking
8 about as an objective is exactly the way the
9 system is supposed to work. So we're with you
10 on that. I just want to make clear that it is
11 not something that had been previously
12 approved and now is being said is flawed.

13 The only sense in which it was
14 closed was that the claim was closed by NIOSH
15 and Labor and is now subject to our review.
16 That's the point at which we step in.

17 DR. MCKEEL: That's the way I had
18 understood it.

19 CHAIRMAN ZIEMER: Okay. Let's move
20 on, shall we. How are we doing on time? We're
21 good.

22 That was item 3. Item 4 was the

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1 film badge data, the lack of film badge data.
2 Reference is made to the uranium purchase
3 orders, reference made to John Mauro's
4 citation that the Work Group had not yet acted
5 on that information. The findings merit
6 immediate recommendation from the Work Group
7 to the full Board to approve the SEC.

8 Well, my initial comment was there
9 are some film badge data and we recognize
10 that. We do have the Landauer data, so it's
11 not -- it's the early period that I think we
12 probably focused on in terms of the SC&A
13 remark.

14 But in cases where the film badges
15 are more claimant-favorable, of course, those
16 could be used. But there's many cases where we
17 don't have film badge records -- the early
18 years here at GSI are one of those -- and if
19 they don't exist or haven't been recovered,
20 then the DR reviews do permit reconstructing
21 doses from source term data.

22 Now, we still have to deal with

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1 the issue of reliability of source term data
2 and related practices in the early years for
3 example, so that's still an open question.

4 But I believe as a Work Group, we
5 still feel, in terms of our charge and what
6 we're compelled to do, is to deal with the
7 information we have. The lack of film badge
8 data itself is insufficient to say that we
9 should automatically declare this to be a SEC
10 class, in my judgment.

11 The statement that there's no
12 remedy in sight; I guess I would not agree
13 with that. Maybe I'll change my mind as we
14 proceed, but I think there are some endpoints
15 in site.

16 Certainly at some time down the
17 road and perhaps fairly soon, if we can
18 clarify the early years, we could make a
19 decision on whether or not we have enough
20 information to reconstruct dose from source
21 terms or not. But either way, there is a
22 remedy in sight, I believe.

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1 That's my initial comment on that.
2 Others have reactions or --?

3 MEMBER GRIFFON: I just agree.

4 CHAIRMAN ZIEMER: Dan, do you have
5 additional comment on that one?

6 DR. MCKEEL: Yes, sir. One is that
7 comment four is related to the lack of film
8 badge data and purchase orders for 1953.

9 CHAIRMAN ZIEMER: The early years,
10 yes.

11 DR. MCKEEL: The other comment is
12 not just I, but John Mauro in a previous Work
13 Group session and at this Work Group session
14 has said that for SC&A at the present moment
15 where things stand, that's going to be a major
16 problem down the road.

17 What I meant by no remedy in sight
18 is if somebody comes up with a new strategy or
19 like the 45 boxes of classified material that
20 is now being examined to see if it's relevant
21 to Dow, you know, unless somebody comes up
22 with a sudden new find, that's what I meant --

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1 that there is no remedy in site for obtaining
2 the film badge data or the purchase orders for
3 1953 to 1963.

4 We've been to the Department of
5 Energy and they say they have exhausted their
6 resources in doing so. So that's the context
7 that I made that comment.

8 Of course, when and if whatever
9 recommendation you're going to make is
10 entirely up to the Work Group, but I was
11 saying that to me, based on what's done at
12 other places, and this is just my opinion, but
13 I think we are at the point where we have no
14 data, no monitoring data, no real monitoring
15 data for 10 of the 13 years of the covered
16 period.

17 Obviously, NIOSH has made some
18 determination that they're able to back-
19 extrapolate existing data to that period of
20 time and so forth. But I'm expressing my
21 opinion as co-petitioner.

22 CHAIRMAN ZIEMER: Okay, and that's

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1 fine. We appreciate that.

2 Of course, I'm going to suggest
3 that we at least take a look at what NIOSH
4 presents the next time we're able to deal with
5 the Appendix BB issue. It may be that we'll be
6 at the point then that we can more clearly see
7 what to do on the earlier years.

8 I quite agree. I don't think we're
9 going to sit and say, well, let's wait and see
10 if somebody finds additional data. In my mind,
11 we have to go pretty much with what we have
12 now in terms of source term and in monitoring
13 or lack thereof.

14 NIOSH will have to make a final
15 sort of ascertainment as to whether or not
16 they believe they can reconstruct dose based
17 on present source term information and then we
18 will either have to agree or disagree that
19 that can be done in a manner that fairly
20 bounds things and see from there.

21 MEMBER GRIFFON: I'm sorry. What is
22 NIOSH's approach now -- the current, on the

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1 books for this?

2 MR. ALLEN: In Appendix BB, you
3 mean?

4 MEMBER GRIFFON: Yes.

5 MR. ALLEN: For a particular time
6 period?

7 MEMBER GRIFFON: External dose for
8 this early time, yes.

9 MR. ALLEN: Appendix BB is a model
10 dose based largely on the betatron machine and
11 there's an activation product, uranium and
12 activation steel.

13 MEMBER GRIFFON: And you've made
14 certain assumptions on occupancy factors and
15 things like that, right?

16 MR. ALLEN: Yes.

17 CHAIRMAN ZIEMER: Well, the
18 betatrons, in my mind, although they are
19 complex, they're a little easier to
20 characterize.

21 I mean, it would be hard to say
22 that the operations were very different in the

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1 early years.

2 I think the radium sources may be
3 the ones that call things into question in
4 terms of where they were used, how they were
5 used, and what the controls were.

6 And I think the radium sources, as
7 I recall, you're still characterizing those in
8 terms of source output and distance, right?

9 MR. ALLEN: Yes.

10 CHAIRMAN ZIEMER: I think in
11 principle, it seems like you can do that but
12 there's some questions that have to do with
13 practice that come into play.

14 I think SC&A has raised those
15 issues and to some extent, pointed out
16 analogies with other facilities in years where
17 we are not able to pinpoint controls. We don't
18 have monitoring data. We don't have
19 information on, apparently on the extent to
20 which the workers and others were controlled
21 in terms of their exposures.

22 I guess that was the nature, John.

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1 You can help me out there.

2 DR. MAURO: The way I've been
3 looking at this is that the betatron models
4 and concerns -- workers who were involved in
5 working the betatron is a tractable problem.

6 We have lots of differences of
7 opinion on the best way to do it and what the
8 assumption should be on distances and times
9 and on the activation products in the neutron
10 unit.

11 All of this is, in my mind,
12 tractable. What in my mind right now is some
13 question as to whether it's tractable, is
14 reconstructing doses to workers who were
15 involved in using radium sources, especially
16 in the 1950s without having any film badge
17 data.

18 That becomes a problem, a class of
19 problem, that I find difficult but as being
20 tractable and it comes down to that.

21 CHAIRMAN ZIEMER: So in part, we
22 need to take a look at what is being proposed

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1 on the radium sources. I mean, it's in the
2 paper there and we can take a look at it.

3 DR. ANIGSTEIN: I'd like to state a
4 minority opinion even on the betatron. I think
5 that the doses to the betatron operators are
6 pretty much -- are tractable because first of
7 all there's models and we have detailed
8 information from -- there was like four former
9 betatron operators who got together and
10 compared notes and sent us e-mails and faxes.
11 Besides, they were badged.

12 We can quibble about the badges --
13 how they accurate they were, but they were
14 badged.

15 Workers who were not betatron
16 workers were in the unshielded parts of
17 Building 10, I think -- I don't know how to
18 deal with because, as I pointed out, somebody
19 in the restroom getting 53 -- I forget what it
20 was -- 30 mR per hour.

21 I don't know workers at another
22 point, the chainmen who handled the uranium --

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1 and they were not assigned any skin dose
2 because they were not in this category of
3 betatron plus two hours.

4 So whether it can be done is one -
5 - we can never say something can't be done
6 until someone has tried to do it. But so far,
7 it has not been done in a manner that would
8 meet the test of our all workers, all the non-
9 betatron operators, being treated properly and
10 fairly even during the film badge period
11 because they weren't given film badges.

12 We had something like 3,000
13 employees in GSI and between 17 and 60 on any
14 given week had film badges.

15 CHAIRMAN ZIEMER: Nonetheless, in
16 spite of that, in my mind, betatrons are still
17 easier to deal with partially because they're
18 fixed in location. We know something about
19 their outputs and you can -- even if -- you
20 can make reasonable assumptions about
21 occupancy. So in principle, it's much easier
22 than a case where you have radiant sources

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1 which can be used in any number of different
2 places. We don't know how they were -- but
3 again --

4 DR. ANIGSTEIN: Including
5 somebody's spot.

6 CHAIRMAN ZIEMER: I think what
7 we'll have to deal with is how NIOSH proposes
8 to reconstruct dose in those cases and whether
9 or not that -- in the minds of the Board is --

10 MR. DUTKO: Dr. Ziemer?

11 CHAIRMAN ZIEMER: Yes.

12 MR. DUTKO: This is John Dutko,
13 betatron megnaflux operator.

14 CHAIRMAN ZIEMER: Yes, John.

15 CHAIRMAN ZIEMER: Dr. Ziemer, I
16 know it is very true that we were badged, but
17 a good portion of that time when we worked in
18 9 and 10 building in magnaflux over time, we
19 did not wear those badges the same as the
20 people out there. The only time we wore the
21 badges, once more, was when we were working in
22 the betatron, sir.

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1 I look at it from a different
2 perspective. When you people do dose
3 reconstruction, you look at a piece of paper.
4 I look at my fellow workers here on this end
5 with cancer, sir. That's what tells the story
6 on my end. Thank you.

7 CHAIRMAN ZIEMER: Yes. Thank you
8 for that comment. I think we're aware of that
9 -- your statements before about the betatron
10 workers only wearing their badges in the
11 betatron, which incidentally, I noticed in the
12 documents that we got -- some of the
13 management radiation safety documents -- you
14 can go back and check the ones, recently
15 recovered documents, have statements in them
16 saying that betatron operators are required to
17 wear their badges all the time, including the
18 times they are outside of the betatron.

19 That's very much in conflict --
20 the official statements in the GSI safety
21 manuals are very explicit about the betatron
22 operators wearing their badges at all times

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1 during work hours regardless of whether or not
2 they're in the betatron room. You can go back
3 and check that.

4 So I know that that may have not
5 been the practice.

6 MR. DUTKO: It was company policy
7 not to wear them, sir.

8 CHAIRMAN ZIEMER: I'm telling you
9 it was company policy in writing to wear them
10 is what I'm telling you. They may not have
11 enforced it, but it's in writing in the
12 documents that were just provided to us.

13 MR. DUTKO: I might be wrong, but I
14 guess --

15 CHAIRMAN ZIEMER: You probably are
16 correct that it wasn't done, but I was
17 surprised to read it in the documents.

18 I'll go back and double-check.
19 I read it, I think, several times. I said,
20 wait a minute. This -- I know that I've heard
21 this statement that nobody wore them outside
22 the betatron room. Why did the safety manuals

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1 say this?

2 MR. DUTKO: We were told not to
3 wear them on the floors because of burning,
4 hot sparks, grinding, welding -- anything that
5 could damage it.

6 CHAIRMAN ZIEMER: I don't doubt
7 that that was the practice. My only point was
8 that it appears that the practice was
9 different from the official written policy.

10 But that's -- you know, that
11 doesn't change the fact that you didn't wear
12 them all the time.

13 Okay. Let's go on quickly here.
14 Item -- where are we at? Item 6 -- Item 5 --
15 no direct neutron monitoring data.

16 My initial comment is that the
17 absence of neutron monitoring data doesn't
18 prevent reconstruction of neutron doses since
19 you can calculate neutron production rates
20 very readily from the operating parameters of
21 the cyclotrons and from the composition of the
22 target materials. In my mind, the neutron

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1 doses are relatively easy to handle.

2 Bob, do you have a different view
3 of that?

4 DR. ANIGSTEIN: No. I mean, I
5 don't agree with the proposed method that was
6 at an early Work Group meeting that was
7 proposed by Dave Allen of taking the
8 neutron/proton ratio and then changing the
9 proton dose to recalculate the ratio and the
10 neutron dose through it.

11 But yes, we did do an analysis of
12 the neutron dose and it's usually -- when the
13 proton doses were high, the neutron doses were
14 a relatively small fraction.

15 CHAIRMAN ZIEMER: Well, my
16 experience with high-energy accelerators is
17 that the neutron doses to workers are
18 typically very small. Typically, where you
19 get the most neutrons is right at the target
20 and that's where you get the activation so you
21 get activation products, which gives some
22 residual dose to workers after the thing is

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1 shut off.

2 But in any event, I think you can
3 calculate neutron doses pretty readily.

4 DR. ANIGSTEIN: I agree.

5 CHAIRMAN ZIEMER: So whether or not
6 you monitored for the neutrons per se is not
7 as critical. But that's just a comment.

8 MEMBER GRIFFON: I'm just going to
9 ask the same question as the last one. What's
10 the current approach? Are you still using
11 neutron/proton ratios?

12 MR. ALLEN: That was the proposal
13 that Bob just said he disagrees with, but the
14 Appendix doesn't include that.

15 CHAIRMAN ZIEMER: But I guess
16 you'll need to address that in some way when
17 you go through the new materials, taking into
18 consideration the comments plus the new source
19 term. Certainly in my mind, you can do
20 neutrons pretty easily.

21 MEMBER GRIFFON: I guess the only
22 question -- I mean, I can see how you would

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1 approach it, but I think you're going to go
2 with probably bounding scenarios or whatever
3 where you look at different combinations of
4 the source terms and you know.

5 CHAIRMAN ZIEMER: Yes. You might
6 take the -- I mean, it goes up with the
7 energies.

8 MEMBER GRIFFON: Right.

9 CHAIRMAN ZIEMER: The photon
10 energy. There's a neutron cross-section and
11 then also it's going to vary with target
12 material.

13 MEMBER GRIFFON: Is that the way
14 you're leaning is toward modeling something
15 like that rather than neutron/proton ratios
16 off the --

17 MR. ALLEN: Yes. I mean, neutron
18 production -- I mean, the only evidence of it
19 is the physics associated with it. The physics
20 are well known and can be modeled.

21 MEMBER GRIFFON: And you have this
22 -- I know we've talked about source term a

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1 little bit here, but you're pretty confident
2 that you can run the gamut of the source terms
3 that they would have used, right? Not when
4 they're scanning upper targets.

5 MR. ALLEN: Yes. I believe so if
6 I'm understanding your question. Yes.

7 MEMBER GRIFFON: I mean, there was
8 uranium in this and there was some steel?

9 MR. ALLEN: Right. Yes.

10 MEMBER GRIFFON: We know enough
11 about the end material.

12 MR. ALLEN: Yes.

13 CHAIRMAN ZIEMER: Comment 6 was --

14 DR. ANIGSTEIN: I just brought up
15 to the Board the neutrons.

16 CHAIRMAN ZIEMER: Okay. Bob has a
17 slide here on the neutron production, but I
18 don't think it's important that we know the
19 numbers right now; just the fact that -- now,
20 what you have there, Bob, is that calculated
21 based on outputs or what is that you're
22 showing us?

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1 DR. ANIGSTEIN: That's based on the
2 maximum output of the betatron depending on
3 whether we were shooting -- this is based on
4 the report.

5 This is depending on whether we
6 were shooting with the casting of the railroad
7 track or in the center of the shooting room.

8 CHAIRMAN ZIEMER: But your neutron
9 values are based on what?

10 DR. ANIGSTEIN: I calculated using
11 MCNP and using -- basing on first principles.

12 CHAIRMAN ZIEMER: Right.

13 DR. ANIGSTEIN: We modeled the --

14 CHAIRMAN ZIEMER: Right. That's
15 sort of, in general what I had in mind.

16 The one thing you always notice on
17 this, for example, if I take your first set of
18 -- I'll just tell Dr. McKeel and Mr. Ramspott
19 that we're looking at a chart that came out of
20 one of the SC&A reports.

21 DR. ANIGSTEIN: Page 14.

22 CHAIRMAN ZIEMER: It's the April

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1 21, 2008 report.

2 The photon doses are, in general,
3 about an order of magnitude bigger than the
4 neutron. But the neutron is not -- you know,
5 you don't ignore. It may increase the total
6 dose by 10 percent. These are expressed in
7 millirems, so you take into consideration the
8 quality factor for the neutrons.

9 DR. ANIGSTEIN: Yes. Oh, yes.

10 CHAIRMAN ZIEMER: So that's sort of
11 the issue that -- you don't need necessarily
12 film badges to know the neutron output because
13 you can reconstruct it from first principles.

14 DR. ANIGSTEIN: Correct.

15 MEMBER GRIFFON: And then I guess
16 the difficulty in this kind of model comes
17 into placing the workers in the area or
18 wherever -- operators versus -- it's
19 interesting that roof reading --

20 DR. ANIGSTEIN: Yes, because that
21 was the one place where, according to -- it's
22 very interesting. According to some of the

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1 information written for the AEC license
2 applications for the room 6 using the small
3 cobalt sources -- a quarter millicurie, a
4 quarter curie cobalt sources, no one was to be
5 -- no one was to go on the roof. No one could
6 even go into the overhead frame without
7 permission from the Radiation Safety Officer,
8 who was also the supervisor, you know,
9 familiar with his name, also the supervisor
10 there.

11 However, nothing was said about
12 the betatron building. According to one worker
13 who attended this briefing session in
14 Collinsville in the fall of 2007, he said he
15 went up and serviced the fans on the roof of
16 the betatron building.

17 I said, did you communicate with
18 the operator and tell him you were going to be
19 up there like, don't shoot, I'm here. He says
20 no. There was no communication.

21 He didn't go through the building
22 to get to the roof. He went from up, from the

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1 next building.

2 MEMBER GRIFFON: Right.

3 CHAIRMAN ZIEMER: Okay, comment
4 number 7, NIOSH has not characterized all
5 radiation source terms as mandated.

6 Of course, now we need to
7 determine if this is still the case after the
8 most recent NIOSH White Paper that they have
9 provided us with. Is that still the case?
10 That's sort of an open question yet, as we
11 understand. It certainly was true before that.
12 Is it still true?

13 Then a series of comments; NIOSH
14 has made no report on NRC 2010-0012 sealed
15 source licenses that GSI has obtained and so
16 on.

17 Well, of course, as we've already
18 indicated, they have now produced the White
19 Paper that evaluates those referenced
20 materials and they provided a dose-
21 reconstruction approach.

22 As far as -- there's comments

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1 here. Let's see. I guess Dr. McKeel had said
2 that he believes that SC&A should review this
3 material and talked about the Board and Work
4 Group have not tasked SC&A to do so and was
5 asking that we ask SC&A to review the NRC
6 material.

7 My comment on that is that in my
8 mind, that's NIOSH's job to review the
9 documents and then to give their position on
10 those and make the evaluation.

11 Now, it certainly -- and then if
12 we task SC&A to review the NIOSH positions,
13 obviously, they may need to return to those
14 documents.

15 But my view on it was -- of
16 course, if we had a different view, we could
17 do that tasking today, but my view is that in
18 tasking, to review those documents is not an
19 SC&A job. That's a federal job. That's their
20 job to say, here's this information. Here's
21 what it means to us. Here's how we will use
22 it.

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1 Once we know that -- what they
2 plan to do with it -- then we can say, all
3 right, is that the right plan?

4 So that's kind of my view on that.
5 So we don't, in my mind -- of course, as John
6 knows, this has sort of been an ongoing theme
7 for me. I keep saying let's not task SC&A to
8 do NIOSH's jobs.

9 So of course, the Work Group
10 members -- we, ourselves -- I think the point
11 that this was -- Dr. McKeel made a statement
12 that we had had the materials very long
13 ourselves, but obviously, we are free to
14 evaluate those and should on our own become
15 familiar with the contents and so on and then
16 as we proceed forward, we may have additional
17 tasking.

18 But that was sort of my reaction
19 on that. I don't know how the others of you --
20 do you have a differing view? Feel free to
21 make that known.

22 I want to make sure that we're on

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1 the same page. Dr. McKeel do you understand my
2 sort of position on that?

3 DR. MCKEEL: Dr. Ziemer, this is
4 Dan McKeel.

5 CHAIRMAN ZIEMER: Yes?

6 DR. MCKEEL: Yes, I do understand
7 your position on that. I do have a comment on
8 that item number 7C about the 80-curie cobalt-
9 60 source.

10 CHAIRMAN ZIEMER: Yes, go ahead.

11 DR. MCKEEL: Okay. Actually, the
12 1969 80-curie cobalt-60 source was at GSI.
13 That was documented in those NRC papers that
14 you now have.

15 Now, that 1968 date is what I want
16 to stress to you is a different date
17 concerning first arrival of the big source
18 than a number of the GSI workers have provided
19 sworn affidavits about this matter.

20 What they have said collectively -
21 - there was a cobalt-60 GSI-owned 80-curie
22 source in use at GSI in the 1963, 4, and 5

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1 time frame.

2 What is fairly convincing about
3 that to me, very convincing, is that people
4 like Mr. Dutko, who is on the line today,
5 assisted with that large cobalt-60 source,
6 which really physically couldn't be confused
7 with the small sources that were used in
8 Building 6.

9 That large source was used in the
10 new and the old betatron building. In fact,
11 proof that it was is the fact that in both the
12 old and new betatron building, there were
13 ports were made in the control room wall.
14 We've sent in pictures of one of those in the
15 old betatron building of shielded ports
16 through which the cable ran that retracted the
17 pig -- I mean the source from the pig -- out
18 in the betatron facility.

19 The men have further testified
20 that those cobalt-60 gamma sources -- the big
21 one, the 80-curie one, was used for
22 Westinghouse channel heads, which were up to

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1 20 inches thick in parts and featured a dome
2 structure that really only a cobalt-60 type
3 source could accommodate that sort of
4 radiography. Films could be placed on the
5 inside. Imaging such a large casting required
6 multiple shots.

7 Anyway, they were Westinghouse
8 nuclear power plant channel heads and missile
9 launch tubes for submarines, nuclear
10 submarines that were also imaged with gamma
11 sources that could not -- could not have been
12 imaged with the small cobalt-60 sources.

13 Also, Mr. Ramspott pointed out
14 that in David Allen's report -- the recent
15 White Paper on sources, on page 5, he mentions
16 the 70-minute exposure on thick steel. Well,
17 the little sources really couldn't image
18 through thick steel -- how thick it was.

19 But anyway, as it's clear that the
20 license says that there was a 1968 cobalt-60
21 source and the license renewal implies that
22 that's when it first came to GSI. But we

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1 certainly have countervailing testimony from
2 more than one worker who says they used the
3 big Co-60 source there.

4 So I think that this is another
5 example where the proof, quote, is worker
6 testimony and you know, that's probably -- I
7 mean, unless -- again, unless somebody else
8 can turn up with relevant records like
9 registration records from the State of
10 Illinois, that's where things may lie. The
11 decision will be, do you accept the workers'
12 statements or if you do reject the statements
13 of eyewitnesses who say they assisted with a
14 cobalt-60 source, then you would have to
15 conclude that they really were grossly
16 ignorant of the situation.

17 At the very least, they were -- I
18 don't know how you would resolve that. But
19 here are good people who have no reason to
20 misrepresent things. They say the big source
21 was used in 1963,4,5. I need to put that on
22 the record.

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1 CHAIRMAN ZIEMER: I'm glad you
2 emphasized that point. Dan, do you recall -- I
3 read these license applications but there were
4 several of them and I don't recall now. Do you
5 recall if the 63 application itself mentioned
6 the cobalt, the 80-curie source?

7 DR. MCKEEL: No, sir. I read them
8 front to back and a mention of a large cobalt-
9 60 80-curie source does not appear until the
10 1968 renewal.

11 As much as I would love to say
12 that it implies that the source was there and
13 just added to the license, it really reads to
14 me as though the large source was added in
15 1968.

16 So I would say it's an unresolved
17 dilemma: worker testimony versus license
18 application. I don't know what to do with
19 that.

20 My suggestion was, in other
21 documents that I've submitted, is some light
22 may be shed on the fact by looking at the

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1 records from the GSI Eddystone, Pennsylvania
2 plant, which as you all know, closed in 1963
3 and one of the betatrons, for instance, was
4 brought to General Steel and put in the new
5 betatron building.

6 There is some suggestion,
7 speculation among the workers that perhaps a
8 cobalt-60 large source was brought from
9 Eddystone to Granite City.

10 But again, and I think Dr. Ziemer
11 would agree with me that that should have been
12 licensed, there should be transfer papers and
13 as soon as that source got to Illinois, it
14 should have been registered immediately with
15 the NRC and/or IEMA or both. We don't have
16 any of that data. We don't have any of that
17 documentation, so that's all I know about
18 that.

19 CHAIRMAN ZIEMER: Okay, I
20 appreciate those comments. So the suggestion
21 is that there's a possibility this was at
22 another site. Where was that? Pennsylvania?

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1 DR. MCKEEL: Eddystone actually did
2 very similar work.

3 CHAIRMAN ZIEMER: But they were
4 located?

5 DR. MCKEEL: In Pennsylvania.

6 CHAIRMAN ZIEMER: Pennsylvania.
7 When that betatron was moved to Illinois, that
8 possibly the source also might have --

9 DR. MCKEEL: That's one of the
10 ideas, right.

11 CHAIRMAN ZIEMER: Yes. Of course,
12 then there would have had to have been a
13 license in Pennsylvania for that.

14 DR. MCKEEL: But that's never been
15 asked about and I will admit that's one of the
16 to-do tasks that I've not gotten around to.

17 CHAIRMAN ZIEMER: Because on the
18 licensed sources is a twofold thing. Those
19 that have worked in this field over the years,
20 you know that not only did the recipient have
21 to have a license, but the provider, whether
22 it was a commercial firm or another

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1 institution, had to have evidence that there
2 was a license for the person or the entity
3 receiving the source.

4 So if the thing was at another facility and
5 transferred without that being done, you have
6 kind of a double violation.

7 DR. MCKEEL: I agree.

8 CHAIRMAN ZIEMER: Yes.

9 DR. ANIGSTEIN: Just to clarify,
10 the Eddystone facility belonged to General
11 Steel Industries.

12 CHAIRMAN ZIEMER: But it could have
13 had a separate license.

14 MEMBER POSTON: Doesn't make any
15 difference.

16 CHAIRMAN ZIEMER: It probably would
17 have had a separate license in a separate
18 location.

19 DR. ANIGSTEIN: If the license is
20 here it should be for Granite City.

21 CHAIRMAN ZIEMER: Yes. But I can
22 envision -- because it's happened to me where

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1 a source gets transferred to a site and gets
2 used and then suddenly somebody realizes, wait
3 a minute, we're not covered by this in our
4 license. We've got to get our license updated.

5 Yes, so those violations do occur.
6 It's quite possible.

7 DR. MCKEEL: I mean, Mr. Norris,
8 who was a supervisor at GSI and started the
9 film badge program and so forth and so on, you
10 know, he also came there from Eddystone and
11 knew all about that.

12 So it is possible. I mean, it's
13 possible.

14 CHAIRMAN ZIEMER: Okay. Dave has a
15 comment.

16 MR. ALLEN: The 1968 application
17 for renewal of the license -- part of that
18 application describes the process which they
19 were using.

20 They used the same general write-
21 up year after year, but in that year, they
22 added in a paragraph about the 80-curie

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1 source.

2 It said in addition, due to
3 workload and large industrial casting, General
4 Steel Industry has decided to obtain one 80-
5 curie cobalt-60 source from Radionics
6 Incorporated.

7 It goes on, but it certainly
8 implies there that they intended to purchase
9 this from Radionics and there is later a
10 disposal of three sources. I believe it was
11 the Radionics and that would include our
12 number, right?

13 CHAIRMAN ZIEMER: Is there any
14 evidence -- do we have any Radionics records
15 showing that they provided such a source?

16 MR. ALLEN: Not that I'm aware of.

17 DR. MCKEEL: This is Dan McKeel
18 again. I have not -- I don't have any
19 documents to prove that. Oh, I'm sorry --
20 except the license itself.

21 CHAIRMAN ZIEMER: Right. Well, you
22 know, and again, this is an open issue here,

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1 but one of the things that we'll have to
2 resolve, I think, is NIOSH will have to take
3 into consideration the worker testimony that
4 there was an 80-curie source, whether or not
5 it's licensed immaterial

6 If it were there -- if we reliably
7 thought it was there for some reason, can you
8 still characterize it in principle? I guess
9 you can.

10 DR. MCKEEL: Well, like I say, the
11 ports that are described in the license
12 document were present there during the early
13 1960s when people like Mr. Dutko were there.
14 He left by 1966, so he was -- if they weren't
15 put in until a big source were put in in 1968,
16 Mr. Dutko would have no way of seeing that.

17 And those ports -- we couldn't get
18 into the new betatron building, but we did
19 extensively tour the old building and took
20 pictures of the ports.

21 And the diagrams in the license
22 actually show floor diagrams of the betatron

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1 facilities and they both show and state that
2 the cobalt-60 sources were not -- big ones,
3 I'm talking about -- big one -- not to be
4 moved out of those buildings. In fact, there
5 is a letter in that material -- quite
6 interesting -- where apparently GSI applied to
7 use the large 80-curie source outside and the
8 Illinois Department of Public Health, which
9 later turned over its records to IEMA, denied
10 that request.

11 Actually, the AEC went along with
12 them. So even though we know that some 80-
13 curie source was used outside and the
14 gentleman that Dr. Ziemer is going to speak
15 about his interview, actually told us -- I
16 think put on the record -- that he had to stop
17 an outdoor 80-curie cobalt-60 source shot.

18 You know, so there's a lot of
19 corroboration that there was a large source
20 there at one point. The fact that the men say
21 that they knew about those ports and saw those
22 ports had to mean that they were put in there

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1 well before 1968.

2 You know, there is at least a
3 little bit of physical evidence as well. There
4 are no pictures that I'm aware of of the GSI
5 large cobalt source unfortunately, but there's
6 a lot of testimony about it.

7 CHAIRMAN ZIEMER: Okay. Well,
8 thanks for that additional information.
9 Comment here or a question?

10 MEMBER POSTON: I was just going to
11 say that the only difference between the 80-
12 curie source and the small source is time.
13 They have the same photon. They don't
14 penetrate -- the quality of your radiograph is
15 --

16 CHAIRMAN ZIEMER: Right. You could
17 make a radiograph with a small source because
18 the penetration is exactly the same. It's just
19 getting enough photons to get a picture, so a
20 small source would take much, much longer.
21 Those were less than a curie. They were maybe
22 half a millicurie, so you're talking about 160

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1 times longer.

2 MEMBER POSTON: Sure.

3 CHAIRMAN ZIEMER: So it's not
4 practical for probably --

5 MEMBER POSTON: He's implying that
6 you could only do it with a big source. You
7 can do it with any size source.

8 CHAIRMAN ZIEMER: It's not a
9 penetration issue. It's a time issue, yes.

10 MR. RAMSPOTT: Dr. Ziemer, this is
11 John Ramspott, if I may?

12 CHAIRMAN ZIEMER: Yes, John?

13 MR. RAMSPOTT: The type of casting
14 alone -- the channel head, the steam chest,
15 the Polaris submarine missile launch tubes --
16 they required a larger source.

17 CHAIRMAN ZIEMER: John, all Dr.
18 Poston is saying is that a smaller cobalt --

19 MR. RAMSPOTT: I agree with Dr.
20 Poston. He's making a very good point.

21 CHAIRMAN ZIEMER: A small cobalt-60
22 source and a large cobalt-60 source both have

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1 identical penetration.

2 MR. RAMSPOTT: I fully understand
3 that.

4 CHAIRMAN ZIEMER: The only
5 difference is it takes longer with a small
6 source than a large to get enough protons
7 through.

8 MR. RAMSPOTT: I understand. He
9 made a very valid point. I understand that.
10 There would be no reason to try and do that
11 job with a quarter curie. It would take --
12 what did you say? 160 times longer?

13 CHAIRMAN ZIEMER: Whatever it was,
14 yes.

15 MR. RAMSPOTT: I mean, that's --
16 and those type of castings are what they had.
17 We have pictures of it and they're dated.
18 Those are the kind of castings they had at
19 Eddystone, Pennsylvania.

20 It's coincidental, at least in my
21 mind, that there's an application for an 80-
22 curie source in 68. They closed the plant down

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1 in Eddystone in 63. The cobalt-60, if I
2 understand it, has a half-life of 5.7 years.
3 It's about a five-year spread that all of a
4 sudden, they now need a new cobalt source, an
5 80-curie source.

6 If I were a betting man, I would
7 bet that came down from Eddystone, no ifs,
8 ands, or buts. The betatron, and until we made
9 people aware of it, most didn't even know
10 there was a second betatron at GSI. So just
11 because there's no paperwork on it doesn't
12 mean it wasn't there.

13 CHAIRMAN ZIEMER: We understand.
14 We're going to take a comfort break in a
15 moment.

16 I just very quickly wanted to
17 point out that on number 8, that had to do
18 with the Picker X-ray film business. We've
19 already talked about that.

20 On number 9, it talks about the
21 need to update Appendix BB. We're actually, of
22 course, going to do that. We have the recent

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1 source-term information and we have the
2 documentation that's been gathered.

3 I just wanted to add that we need
4 some -- it would be helpful to know what time
5 table NIOSH might be on to update the Appendix
6 BB information. I don't know how fast that
7 will come about. I mean, I don't necessarily
8 want you to have to commit to anything, but we
9 need to have some idea of planning ahead when
10 we're going to be able to meet again and so
11 on.

12 MR. ALLEN: Well, you've already
13 asked me to update the responses.

14 CHAIRMAN ZIEMER: Which is
15 basically what we need.

16 MR. ALLEN: We could essentially
17 put a plan together and a time line, update
18 those responses, and send along what our path
19 forward is essentially at that same time.

20 CHAIRMAN ZIEMER: For Appendix BB?

21 MR. ALLEN: Yes. I couldn't commit
22 to a reasonable date at this point right now,

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1 but I can sort it all out.

2 CHAIRMAN ZIEMER: Well, the first
3 thing was to address the issues that we have
4 and then that will also kind of do -- lay out
5 what is needed to revise Appendix BB in any
6 event.

7 DR. MCKEEL: Dr. Ziemer, this is
8 Dan McKeel. May I make one short comment?

9 CHAIRMAN ZIEMER: Of course.

10 DR. MCKEEL: That short comment is
11 that I noticed in the White Paper that Dave
12 Allen did about the sources that he uses the
13 number in there for the hours worked as 3250.

14 What's very interesting about that
15 number is when you break it down, that's the
16 65-hour work week that was agreed on in Dr.
17 Anigstein's meeting with the workers in
18 October of 07 in Collinsville.

19 So now it's gratifying to see that
20 not only is that a number that SC&A accepts
21 but also NIOSH accepts it.

22 The problem that the petitioners,

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1 advocates and experts and workers and
2 claimants from GSI have is that we have no
3 information, no evidence that that number has
4 been plugged into all the dose
5 reconstructions. More than 90 percent at GSI
6 have been accomplished under Appendix BB.

7 So you made the comment earlier
8 that as part of the normal process, if a
9 parameter such as average work hours a week
10 worked changed, that NIOSH would automatically
11 update their technical document. Well,
12 Appendix BB says the average work week at GSI
13 is 46 hours.

14 It was agreed -- now, almost
15 three, two and a half years ago -- that the
16 average work week consensus of all the workers
17 there was 65 hours. NIOSH appears to accept
18 that, yet that information, which as -- I
19 think Dr. Anigstein pointed out years ago --
20 that that alone is a 35 percent increase in
21 exposure if you just take that simple formula
22 of dose rate times time equals exposure.

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1 So there's an instance where over
2 that -- since 2007 June when Appendix BB was
3 reached, I literally -- I'm sure you have too
4 -- seen dozens and dozens of revised and
5 updated NIOSH technical documents being posted
6 on the OCAS website except for Appendix BB.

7 We simply cannot understand that.
8 So I really just cannot let that just go by
9 unanswered. Again, as much as I appreciate
10 the intention to revise Appendix BB, here we
11 are in May -- next month it will be three full
12 years -- and we still don't have any time
13 commitment at all about when Appendix BB will
14 be updated.

15 You know, by now, the amount of
16 new information is voluminous. So I just must
17 emphasize how -- of all the things that I
18 might be able to say today, that's the most
19 important one of all. We need to have Appendix
20 BB updated as soon as possible. I think I'll
21 let it rest with that.

22 CHAIRMAN ZIEMER: Dave, did you

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1 want to comment on that? That's not been
2 plugged in to the official -- well --

3 MR. ALLEN: Dose reconstructions
4 are being done by the original Appendix BB
5 right now.

6 CHAIRMAN ZIEMER: That's not an
7 officially accepted position, yet you used it
8 in your document, which is a White Paper at
9 this point.

10 MR. ALLEN: A White Paper.

11 CHAIRMAN ZIEMER: It's not an
12 official part -- it has not been incorporated
13 yet into the process.

14 MR. ALLEN: Right.

15 CHAIRMAN ZIEMER: It's like the
16 first step, which you are indicating, though,
17 the intent to use that. Is that correct?

18 MR. ALLEN: Yes. Definitely, that's
19 a point in the estimate. We still have film
20 badge data that has to be reconciled with
21 whatever scenarios we come up with. We can't
22 come up with an estimate that would show up on

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1 film badges if the film badges aren't showing
2 that.

3 One of those film badges is the
4 control room area badge that we have to be
5 able to reconcile that. We can't come up with
6 a model that gives us a millirem an hour for
7 160 hours and a film badge which is less than
8 10.

9 There's quite a few things to
10 reconcile and they all -- the more you lean
11 one direction, takes away from another
12 direction so they all kind of balance out to
13 where you get a clearer picture of what's
14 bounding for reconciling all the information.

15 I hope that answers your question.

16 CHAIRMAN ZIEMER: Well, I think Dr.
17 McKeel was asking whether it's an official
18 part of GSI dose reconstruction at this point.
19 I think the answer is it is not an official
20 position at this point.

21 MR. ALLEN: Right.

22 CHAIRMAN ZIEMER: But we here your

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1 point, Dr. McKeel.

2 We're going to take a comfort
3 break here for 15 minutes and then we'll re-
4 assemble.

5 (Whereupon, the above-entitled
6 matter went off the record at 2:49 p.m. and
7 resumed at 3:04 p.m.)

8 MR. KATZ: We're just reconvening
9 after a short break.

10 CHAIRMAN ZIEMER: Okay, thank you
11 very much. Let's continue with the concerns
12 that Dr. McKeel had raised.

13 Item 10 -- McKeel SEC 105 Findings
14 on Appendix BB and NIOSH SEC 105 Evaluation
15 Report. Pages 1016 of the NRC FOIA materials
16 and several White Papers have not been
17 adequately considered in dispute resolution on
18 the same documents.

19 Only NIOSH and SC&A findings have
20 been duly considered by the Board. The co-
21 petitioner is concerned the scientific value
22 deserves to be addressed and that their own

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1 comprehensive manner by TBD-6000 Work Group or
2 an investigative group should be tasked to
3 expedite this effort.

4 My only comment there is that I
5 believe the Work Group does desire to address
6 the petitioner's concerns. In fact, that's
7 partially what we're doing here. Any that
8 remain inadequately investigated; we'll
9 certainly want to know about that.

10 I just want to commit to Dr.
11 McKeel that we do intend, indeed, to address
12 his concerns to the extent we're able with the
13 help of both NIOSH and SC&A.

14 I think the Work Group would agree
15 that we, indeed, do want to do that. So I'll
16 just pass that along to you, Dr. McKeel and to
17 the others at GSI.

18 Number 11, Dr. McKeel indicated
19 that a presentation he made to the Board in
20 February had not been posted in the public
21 docket as requested.

22 Ted, you might speak to this. I

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1 did note that, of course, this presentation to
2 the Board was in the public record in the form
3 of the transcript. I'm not sure about a
4 separate posting of it, that practice. If it's
5 already in the transcript, do we also post it
6 separately or what's the status?

7 MR. KATZ: I'm not really clear
8 about which we're talking about here.

9 CHAIRMAN ZIEMER: It was a
10 presentation made to the Board. I believe --
11 and Dan, you can help me out -- I think it was
12 provided to us maybe in writing and you gave
13 the presentation by phone as I recall. You
14 maybe had a request that that be put on the
15 website. I don't recall. It is in the
16 transcript. I know that.

17 DR. MCKEEL: I had requested --
18 there were some tables and things that I
19 requested that they be put as -- you know,
20 posted on the website under the public docket.

21 I can resubmit that. That's not a
22 problem. I mean, it's not a problem that we

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1 can't address easily by resubmitting it.

2 CHAIRMAN ZIEMER: I know it wasn't
3 as a separate document. There was a recent
4 document. In fact, it might be this one that
5 was posted.

6 DR. MCKEEL: Yes.

7 CHAIRMAN ZIEMER: But the
8 presentation that you referred to, indeed, was
9 not a separate document but it is in the
10 transcript. Of course, the figures are not
11 there.

12 DR. MCKEEL: Ted Katz helped me
13 with that and, you know, suggested a procedure
14 by which even Board presentations about SEC
15 Evaluation Reports -- that's really what the
16 issue was.

17 Even ones that have tables, if
18 they're submitted as a PDF file, can be posted
19 and so I appreciate his efforts and that's
20 what I'm going to do.

21 CHAIRMAN ZIEMER: Okay. Number 12,
22 and I won't read the whole item, but it has to

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1 do with redaction and specific concerns that
2 both Dr. McKeel and Mr. Ramspott's names were
3 redacted from the Worker Outreach transcript.

4 I think that is more addressed to
5 Mike Gibson, but since it's in this document
6 here, I did want to make a remark on it.

7 First of all, to say that our Work
8 Group is not involved in the redaction policy.
9 But I think you understand the concerns, but I
10 believe they have to be directly addressed by
11 the Agency, number one.

12 I will express my personal view.
13 I don't personally quite understand why Dr.
14 McKeel's name has to be redacted, but
15 nonetheless, it's an issue that the Agency has
16 to deal with.

17 MR. KATZ: I have addressed it.
18 Dr. Ziemer, I've actually responded to Dan and
19 John on this issue.

20 The Board policy, in terms of
21 redaction of third parties, is very clear.
22 This is why it was redacted by the person who

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1 does the redactions.

2 After re-inserting a third party's
3 name when they've been redacted, according to
4 the Board policy that I state at every Board
5 meeting -- I mean, the issue there boils down
6 to just resources to set up a system to un-
7 redact these, I have to balance a lot of other
8 pulls on resources with respect to OGC and
9 other parties that would be involved to do
10 that.

11 At this point, I have a lot on
12 their plates and to charge them with creating
13 a waiver form and other -- and then getting
14 people to take care of redactions when they're
15 requested which is a very unusual circumstance
16 to have a third party want their name un-
17 redacted -- it's just something I can't deal
18 with right now in terms of resources.

19 I've responded to them in writing
20 to both John and Dan. I'll keep this in mind
21 for down the road, but right now, it's just
22 not as high-priority as some of the other

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1 matters.

2 CHAIRMAN ZIEMER: I understand. I
3 just wanted to make sure that we were
4 addressing it.

5 Number 13 has to do with asking
6 the Department of Labor to invoke their
7 subpoena power to gain certain records. Again,
8 I won't go through this in detail, but I did
9 want to comment on -- my own personal comment
10 on that matter.

11 Clearly, additional monitoring
12 records are of value. There's no question
13 about that if there's records out there.

14 My take on it is that the issue
15 may be whether or not such additional records
16 actually do exist and if so, where they are
17 located and is the use of a subpoena necessary
18 to solve the problem.

19 It seems to me if it's clear that
20 an agency or an organization actually has
21 certain records and they are refusing to turn
22 them over, that certainly would be a

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1 compelling place to call for a subpoena. I
2 don't think it's that clear in this situation.

3 I'm sort of asking, is it -- Dr.
4 McKeel, I'm basically asking, is it your
5 contention that a good-faith effort to find
6 the records will only occur if a subpoena is
7 issued?

8 I'm trying to get a feel for
9 whether or not the subpoena will make any
10 difference if the agencies involved don't know
11 where to look or don't know what records are -
12 - what do we gain from the subpoena?

13 DR. MCKEEL: Dr. Ziemer, this is
14 Dan McKeel. Thank you.

15 It really is my opinion that at
16 the present moment, there are relevant records
17 for GSI in the form of radiation registration
18 records for different sources that we're
19 trying to characterize and are incompletely
20 characterized that reside at Illinois
21 Emergency Management within the Nuclear Safety
22 Division.

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1 As I tried to point out, my recent
2 two FOIAs, which landed at IEMA, produced some
3 records, which tells me that if they had some
4 of the records, they're bound to have had
5 many, many more. So the records that we got on
6 their face are very incomplete.

7 Now, it is possible that somebody
8 at the Department of Labor could stop just
9 short of a subpoena and make an effort to
10 contact that agency at the highest level, say,
11 by phone, and see if we could elicit some more
12 cooperation.

13 But I'm still saying that in the
14 long run, I believe that the legal group at
15 IEMA who replied to my FOIA request might
16 listen to a subpoena when they won't listen to
17 other things.

18 I have talked to those folks and
19 do understand that agencies are restricted as
20 far as their personnel that they can devote to
21 things. On the other hand, releasing FOIA
22 requests that the Agency has really isn't an

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1 optional thing. They have to release them.

2 Now, can I prove that they have
3 those records? Well, of course I can't. That's
4 a burden that you could not prove.

5 But you know, as it turns out, I
6 was right about the license information
7 because -- the reason I was right was because
8 it had to exist.

9 Now, you know, it took two tries
10 by me and tries by NIOSH and SC&A to get that
11 information and so forth, but the records did
12 emerge eventually.

13 If you remember, it took multiple
14 tries over several years, including by a
15 senator's aide to eventually get the
16 Department of Energy to release the records
17 that made the Dow Madison Site an AWE site.

18 So I've always contended that
19 where that whole effort stopped short was we
20 should have subpoenaed the Dow Midland
21 Headquarters office who had even more records
22 related to Dow Madison and the thorium

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1 shipments that were said to take place by many
2 workers to Rocky Flats.

3 So it's a judgment call, but the
4 way I would say it is, that is a tool that was
5 written into EEOICPA by the founders who
6 enacted the legislation and it has been used
7 almost never.

8 When I've asked about it, which
9 has been repeatedly, the answer has always
10 come back from both NIOSH and Department of
11 Labor that we don't use it because we are sure
12 that or we believe that everybody is acting in
13 good faith.

14 Well, I'd like to make that
15 assumption, but having gotten responsive
16 documents in some cases two years later after
17 multiple tries, I guess it's a difference of
18 opinion on what constitutes good faith. I do
19 believe that the subpoena would make people
20 look harder.

21 That's all I can say about it.
22 We're missing some vital records that have to

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1 do with General Steel. My efforts -- I believe
2 they reside at IEMA and I think a discussion
3 about subpoenaing those records might be
4 helpful.

5 CHAIRMAN ZIEMER: Thank you. Let
6 me ask a question. Maybe I'll ask -- I'll
7 address it to Ted.

8 Let's suppose there are such
9 records there at the Illinois agency that were
10 needed for dose reconstruction. We don't need
11 to go through Labor anyway, do we, to get
12 those, Ted?

13 MR. KATZ: Not to request them. But
14 when it comes to the subpoena power, I don't
15 know. I think that rests with the Department
16 of Labor. Is that correct?

17 CHAIRMAN ZIEMER: Well, when Dr.
18 McKeel said, perhaps the Department of Labor
19 could stop short of the subpoena but request
20 the records, that an agency requesting the
21 records might have more clout, as it were,
22 than an individual FOIA request.

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1 Wouldn't the same be true or have
2 we already done this? Has NIOSH requested the
3 records?

4 MR. ALLEN: Yes, we have.

5 CHAIRMAN ZIEMER: You have and you
6 have not gotten anything more?

7 MR. ALLEN: We requested everything
8 with GSI. In response, I think we got some
9 licensing Department of Labor letter from not
10 necessarily this particular plant, but the one
11 --

12 CHAIRMAN ZIEMER: The other --
13 Granite City?

14 MR. ALLEN: It did -- at least one
15 of them covered this plant also. But it was
16 after this time frame. It was more modern --
17 in the 90s, if I remember right.

18 DR. MCKEEL: This is Dan McKeel.
19 Let me comment.

20 NIOSH did, in fact, ask for the
21 licenses and Laurie Breyer sent me a nice list
22 of what they had gotten back. I'm talking

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1 about GSI source-term licenses now.

2 But what they got back was all after 1975 so
3 there was no material from before 1975.

4 So again, in a few situations, I
5 got to see the letters that NIOSH wrote. In
6 one instance, for instance, it was a group
7 letter asking for anything you might have
8 about so and so.

9 So it's also in how you go about
10 asking for specific information. For instance
11 on these registration records -- I can send
12 you what they sent me. I think if you approach
13 them by saying we know you have some of the
14 records -- Illinois Department of Public
15 Health said that they turned over their set of
16 records to you so we respectfully ask you to
17 look harder, I think that would be useful.

18 Now, if that would -- I don't know
19 whether that would produce them or not. I
20 can't guarantee that the records actually
21 still exist, but what I do expect -- and
22 should be accomplishable -- is I know that

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1 agencies have records-retention policies and
2 that records are routinely lawfully disposed
3 of and must be. That's fine. But there are
4 also records of when those records are
5 destroyed.

6 There should be an entry in their
7 files. GSI records, 19-whatever. Radiation
8 exposure records, 1975 through whatever the
9 years are were destroyed on so and so, 1990.

10 So I think the agencies can and
11 should come up with that kind of information.
12 If they did, that would be evidence, as far as
13 I'm concerned, of acting in perfect good
14 faith. So that's all I can say.

15 MR. KATZ: Jim, I don't know -- are
16 you -- given that Dan has extracted some
17 information from them, that opens the
18 question, are you willing to take another run
19 with another letter and see if you can --

20 DR. NETON: I have a note here from
21 a previous discussion this morning about that
22 and I'll bring it back with our record people.

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1 It certainly is not an inordinate effort to
2 write a letter.

3 MR. KATZ: Right.

4 CHAIRMAN ZIEMER: Do you have a
5 record of the items that Dan has already
6 recovered from them for those earlier years?

7 DR. NETON: I believe he was going
8 to provide them to us. I think there were only
9 three sources or pieces of information or
10 something that he had recovered.

11 CHAIRMAN ZIEMER: Dan, the
12 information that you already recovered from
13 the Illinois Department --

14 DR. MCKEEL: I'm happy to send
15 them. I'll send them to Dave Allen. Is that
16 who I should send them to?

17 MR. ALLEN: That would be fine.

18 CHAIRMAN ZIEMER: Or Jim.

19 DR. MCKEEL: Okay, I'll send them
20 to both.

21 DR. NETON: Please.

22 DR. MCKEEL: I'll just digitize

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1 them and send them right away.

2 CHAIRMAN ZIEMER: They'll make
3 another run at it and see whether or not it's
4 fruitful at all.

5 DR. MCKEEL: Okay. I'll send you my
6 correspondence so you'll have the whole
7 package.

8 DR. NETON: That would be great.

9 MR. ALLEN: Thank you, Dan.

10 DR. MCKEEL: All right, thank you.

11 CHAIRMAN ZIEMER: I think that
12 takes us through this document. I do know that
13 the end, Dan, that you asked that this
14 document be posted in the public document file
15 --

16 DR. MCKEEL: It has been.

17 CHAIRMAN ZIEMER: -- and it has
18 been. I just wanted to confirm that that has
19 been done so it is there.

20 Okay. I would like us to move now
21 to the petition matrix. This is Petition
22 00105, Issue Resolution Matrix. I'm looking

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1 for the date. The last version I have includes
2 SC&A replies dated the 12th of this month so
3 this is very current.

4 DR. ANIGSTEIN: No.

5 CHAIRMAN ZIEMER: No? That date
6 must have gone in automatically when I -- I
7 was saying, boy -- I didn't -- is this from
8 today? We're really on top of this.

9 DR. ANIGSTEIN: John sent that to
10 you. Did you send that to him?

11 DR. MAURO: The GSI matrix? No.

12 DR. ANIGSTEIN: Yes, I think you
13 did.

14 DR. MAURO: I sent the TBD-6000.

15 DR. ANIGSTEIN: Oh, I'm sorry. The
16 GSI matrix -- did you just open it, open a
17 Word file?

18 CHAIRMAN ZIEMER: I opened Issue
19 Resolution Matrix.

20 DR. ANIGSTEIN: Okay, it updates
21 itself.

22 CHAIRMAN ZIEMER: It must have

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1 updated the date itself.

2 DR. ANIGSTEIN: Yes, it does.

3 CHAIRMAN ZIEMER: That's what
4 fooled me here. But I was looking for your
5 original data on that.

6 DR. ANIGSTEIN: It's 10/12.

7 MEMBER MUNN: October of last year
8 is the date.

9 DR. ANIGSTEIN: Yes. 10/12/2009.

10 MEMBER MUNN: Yes.

11 CHAIRMAN ZIEMER: And that should
12 be made a permanent date and not a --

13 DR. ANIGSTEIN: Well, except that
14 it's a living document. We add to --

15 CHAIRMAN ZIEMER: No, no. But it
16 should be dated the date it was updated.

17 DR. NETON: Make it a PDF.

18 CHAIRMAN ZIEMER: I agree with
19 you.

20 DR. ANIGSTEIN: It should have also
21 been in PDF file. PDF files won't update
22 automatically.

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1 CHAIRMAN ZIEMER: Right.

2 DR. ANIGSTEIN: I think we did have
3 a PDF file.

4 CHAIRMAN ZIEMER: What was the date
5 on this file?

6 DR. ANIGSTEIN: My date is
7 10/12/2009.

8 MR. KATZ: That sounds familiar to
9 me.

10 MEMBER MUNN: That's what I have. I
11 received it on 10/14 and I downloaded it.

12 CHAIRMAN ZIEMER: Well, what I
13 notice is this has the NIOSH responses and
14 then it has an SC&A reply. The note I put on
15 the agenda was for Issues 1,2,3,5, and 6, we
16 need to know the impact of the new source-term
17 evaluations on those items.

18 So I guess what I'm asking here
19 is, Dave, I think we need to find out whether
20 the NIOSH responses still hold true with the
21 new source-term information. Not that you can
22 necessarily answer that now, but do we need to

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1 go back and look at the responses to see if
2 they are still the right ones?

3 MR. ALLEN: Yes. You've asked for
4 an update on our replies.

5 CHAIRMAN ZIEMER: Right.

6 MR. ALLEN: It's being done.

7 CHAIRMAN ZIEMER: Right, now you
8 had something --

9 MR. ALLEN: Just asking for the
10 same thing here?

11 CHAIRMAN ZIEMER: Right.

12 MR. ALLEN: Okay.

13 CHAIRMAN ZIEMER: Specifically on
14 Issues 1,2,3,5, and 6, which I think, to some
15 extent, make use of source-term information.
16 What is the impact of that?

17 And then in turn, if the NIOSH
18 response changes, we need to find out whether
19 or not the SC&A reply changes. So it's kind of
20 a two-step thing, I think.

21 MR. KATZ: Right. As soon as I
22 have responses from DCAS, I can forward these

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1 on the request to have SC&A review those.

2 CHAIRMAN ZIEMER: Did that make
3 sense to the others now? I mean, I don't think
4 it would be fruitful for us to go through all
5 of this based on the old source-term
6 evaluations. Okay, so we'll agree to have
7 NIOSH work that.

8 To some extent, you could work
9 that in parallel with the Appendix BB stuff
10 because a lot of it is similar.

11 So I don't think it's that big of
12 a differential in terms of the task here that
13 you would undertake.

14 MR. KATZ: The same would go for
15 tasking. I would task both of those.

16 CHAIRMAN ZIEMER: Right. And then
17 in Issue 4, I have a note here -- review and
18 discuss the SC&A analysis of this issue.

19 This issue, I think, remains
20 regardless of what happens on the source-term.
21 This has to do with the film badges that we
22 have. We have already pretty well agreed that

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1 what we have is probably what we're going to
2 have to work with. I guess there, we have the
3 NIOSH response. We have the SC&A reply.

4 Now we need to determine whether
5 or not the iteration process -- again, I don't
6 know if NIOSH has had a chance to look at the
7 SC&A reply and say, yes, okay, we agree to
8 disagree or where are we on this? So that's on
9 issue 4.

10 And I neglected to double-check,
11 but I do need to check with the petitioner.
12 Dan, you have a cleared copy of that matrix?

13 DR. MCKEEL: Dr. Ziemer, this is
14 Dan McKeel. I looked for it this morning. I
15 can't find it. I can't say I never got it, but
16 I couldn't find it this morning. I try to put
17 them all in one place.

18 CHAIRMAN ZIEMER: The redacted --
19 or not redacted -- the uncleared copy was
20 issued on the 10th of October. I believe the
21 cleared copy would have been very shortly
22 after that. That would also be on the website,

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1 I believe.

2 No -- no, the matrix wouldn't be
3 on the website. I take that back.

4 DR. ANIGSTEIN: The problem here is
5 --

6 CHAIRMAN ZIEMER: Hang on. Let me -
7 - we want to see if Dan --

8 DR. MCKEEL: I don't have it with
9 me and I couldn't find it this morning. If
10 someone would resend it, it would be -- I
11 would appreciate it a great deal.

12 CHAIRMAN ZIEMER: I don't have a
13 cleared copy here. Does anyone have a cleared
14 copy on their -- let me check. Maybe I do have
15 a cleared copy. Hang on just a moment.

16 MEMBER MUNN: No. Mine still has --
17 my copy still has the disclaimer on the
18 bottom.

19 DR. ANIGSTEIN: Can I clarify this?

20 CHAIRMAN ZIEMER: Yes.

21 DR. ANIGSTEIN: The policy --
22 SC&A's policy or rather, SC&A's interpretation

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1 of CDC policy on this issue
2 is that the matrix is never cleared in the
3 sense that it is a living document and it can
4 always be added to.

5 So there is an October 12th
6 version in a PDF format, which should have
7 been the one that was distributed to the Board
8 -- for some reason, the Word document was
9 distributed -- which has been reviewed by OGC.
10 All the information that should have been
11 redacted was redacted.

12 However, at the bottom, we still
13 retain the Privacy Act disclaimer because of
14 the possibility that, at least to the Word
15 version, there may be additions, in other
16 words, we have SC&A reply. It's an ongoing --
17 there's even a space for Board action,
18 although normally that has not been filled in.

19 Consequently, given the fact that
20 it has the Privacy Act notice, it may be that
21 it cannot be distributed. We need to get --

22 MS. HOWELL: It can be distributed,

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1 but the title of the actual document -- like
2 the Word document title should say whether or
3 not it's been cleared even though you guys
4 want to keep the Privacy Act disclaimer on.

5 DR. ANIGSTEIN: It's up to you
6 guys.

7 MR. KATZ: Right, no, we do. We've
8 been distributing these.

9 DR. ANIGSTEIN: Yes, because we
10 went through this before --

11 CHAIRMAN ZIEMER: Okay, okay.
12 There's got to be preferred versions
13 available.

14 MS. HOWELL: It's supposed to be
15 noted in the title of the document regardless
16 of whether --

17 MR. KATZ: Unrestricted is, I
18 think, what it says.

19 MS. HOWELL: Right.

20 DR. ANIGSTEIN: We have one. It's
21 entitled -- I have the title. I have it right
22 here. It's GSI SEC Issues Matrix SC&A Reply

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1 10/12/09 Unrestricted, a PDF.

2 MR. KATZ: Right, so that you can
3 e-mail to Dan, although I believe it would
4 have been sent to him. But I can understand
5 him not being able to locate it on the spot
6 here.

7 MS. HOWELL: The title should
8 always indicate either PA-cleared or
9 unrestricted and actually, now they say PA-
10 cleared.

11 MR. KATZ: But anyway, that would
12 be it and that can be e-mailed to him right
13 now.

14 CHAIRMAN ZIEMER: So the title of
15 that one does say PA-cleared?

16 MR. KATZ: It says unrestricted.

17 CHAIRMAN ZIEMER: Unrestricted,
18 okay.

19 MR. KATZ: Right.

20 CHAIRMAN ZIEMER: Can you e-mail
21 that to Dan right now?

22 DR. ANIGSTEIN: No, because I do

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1 not have his -- oh, yes, I can. I can. In a
2 round-about way. I have to go through my Palm
3 --

4 MR. KATZ: Send it to me, whatever,
5 and I can forward --

6 DR. ANIGSTEIN: Right this moment?

7 MR. KATZ: If you send it to me
8 right this moment, I can forward it to him.

9 DR. ANIGSTEIN: I will do that.

10 CHAIRMAN ZIEMER: Okay, Dan, we're
11 going to get this to you here.

12 DR. MCKEEL: That's fantastic. I
13 appreciate it.

14 CHAIRMAN ZIEMER: We figured out.
15 It's going to go from Bob to --

16 MR. KATZ: Yes, it will come from
17 me.

18 DR. MCKEEL: I'm impressed. Thank
19 you.

20 CHAIRMAN ZIEMER: We hope it
21 maintains its format in going through these
22 different --

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1 DR. MCKEEL: It will. That's great.

2 CHAIRMAN ZIEMER: Okay, so issue 4
3 then -- in fact, my copy of this here -- issue
4 4 was the film badge dosimetry issue.

5 Here was SC&A's final statement.
6 The issue here is the corrections for the
7 attenuation of incident radiation and the PA
8 orientation when the badge is worn in front
9 are dependent on proton energy. Since the
10 energy spectrum of the residual radiation from
11 the betatron apparatus is unknown, it would be
12 difficult to correct for the exposure
13 geometry.

14 So at that point, I guess it seems
15 to me what is required here would be for NIOSH
16 to be able to say yes, but this is how we
17 would do that.

18 The fact that you don't know the
19 energy does not necessarily mean that you
20 can't do this.

21 DR. NETON: Refresh my memory. This
22 was the winding down of the unit and people

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1 would go in there and there's this sort of
2 capacitor or something that would lead down at
3 the end of the --

4 MEMBER MUNN: Correct.

5 DR. NETON: I think that was what
6 it was.

7 DR. ANIGSTEIN: Yes, well, I have a
8 whole position on this.

9 DR. NETON: I'm aware, I've gone
10 through that, I think.

11 DR. ANIGSTEIN: No, we haven't.

12 DR. MAURO: No, no. We re-analyzed
13 it.

14 DR. NETON: Oh, you re-analyzed it?

15 DR. MAURO: Yes. We took a look at
16 it to see what --

17 CHAIRMAN ZIEMER: Yes, yes, your
18 analysis is pretty much --

19 DR. ANIGSTEIN: I circulated a
20 report and the answer is we don't know.

21 CHAIRMAN ZIEMER: Well, I think
22 what you've done is you've eliminated the

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1 probability that it's due to residual
2 capacitance in the machine.

3 DR. ANIGSTEIN: Right.

4 CHAIRMAN ZIEMER: So what you're
5 going to default to is short-term nuclides
6 that have been activated, I believe.

7 DR. ANIGSTEIN: We've looked at all
8 of the possibilities within our models.

9 In other words, we have modeled
10 the betatron tube itself and there were no --
11 at least, within the limitations of the MCNPX,
12 and this is a new feature which was added to
13 it in its developmental stage, but they do
14 give you a total inventory of what nuclides
15 have been created during the running time.

16 The only ones that would fit the
17 bill would be aluminum-28, which is actually
18 part of the -- one of the constituents of the
19 porcelain and one of the platinum isotopes.

20 CHAIRMAN ZIEMER: Right.

21 DR. ANIGSTEIN: It tells you how
22 many atoms were created. I modeled that and

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1 calculated a dose of six feet and it's in the
2 fractions of the micro R per hour.

3 CHAIRMAN ZIEMER: So what's the
4 contact dose?

5 DR. ANIGSTEIN: Pardon?

6 CHAIRMAN ZIEMER: What's the
7 contact dose rate?

8 DR. ANIGSTEIN: The contact dose --
9 I didn't do contact. I did one centimeter of
10 one of them and it's a two milli --

11 DR. MAURO: One centimeter is fine.

12 DR. ANIGSTEIN: Yes, I know it's
13 fine.

14 CHAIRMAN ZIEMER: No, but I mean
15 six feet is a lot of different --

16 DR. ANIGSTEIN: No, but I mean, it
17 was reported. The measurement was reported at
18 six feet. It was reported at six feet, 15 mR
19 per hour. We can't come within three orders of
20 magnitude of that. So the answer is we just
21 don't know.

22 If we go with the factor of 16 mR

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1 per hour at two seconds after shutdown --
2 let's say five, ten seconds after shutdown, he
3 ran out there to make a measurement and if
4 there was essentially gone -- if they're
5 nearly zero after 15 minutes, so it would have
6 to be something with a half-life that's
7 measured in minutes. If it's a few seconds, it
8 will be gone before you --

9 CHAIRMAN ZIEMER: Under two minutes
10 maybe.

11 DR. ANIGSTEIN: Pardon?

12 CHAIRMAN ZIEMER: One to two
13 minutes?

14 DR. ANIGSTEIN: So these two
15 isotopes are the only ones that fit that bill.
16 One -- the platinum was like one something
17 minutes. The aluminum was two point something
18 minutes.

19 Neither of them -- there's just
20 not enough of it if the MCNPX model is valid.
21 It's the best we've got. It's not -- that
22 aspect of it is not as well tested as other

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1 parts of it.

2 So the answer is we don't know, to
3 be perfectly honest. He also said that it
4 follows the beam profile -- that it falls off,
5 so with that said, it can't be an isotope. He
6 said there's only one percent going behind the
7 machine. There's only one percent -- the
8 intensity it is in front of the machine.

9 CHAIRMAN ZIEMER: Well, I guess I
10 would sort of ask NIOSH to think about that.
11 It seems to me you could make the argument if
12 they're able to measure it anyway at six feet,
13 it's not real soft stuff, which is where you
14 get your response of a film badge. Anything
15 above 100 kilovolts is pretty flat.

16 So if it was that soft, you're not
17 going to be reading it out six feet readily, I
18 don't think.

19 DR. ANIGSTEIN: Well, if it was --
20 the original idea -- if it was a 50 KeV -- 60
21 KeV, if it was a 70 KeV x-ray machine, you
22 would still get a lot of activity at -- sort

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1 of like exposure at six feet. It's not going
2 to be -- the absorption in the body -- below
3 50 KeV, essentially nothing gets through. I
4 mean, nothing is rounded to two decimal
5 places.

6 CHAIRMAN ZIEMER: Nothing gets
7 through.

8 DR. ANIGSTEIN: Less than one
9 percent.

10 CHAIRMAN ZIEMER: Well, sure. That
11 means it's all absorbed.

12 DR. MAURO: Right, and you don't
13 see it under that.

14 DR. ANIGSTEIN: You won't see it
15 under that, so that would be our argument --
16 but yes, the answer is -- you know, you don't
17 usually hear me say that. We haven't got a
18 clue.

19 Whether there was something unique
20 about that particular measurement, whether
21 there was something unique about that
22 particular set-up because the other

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1 information which I'm showing you now that was
2 just discovered -- our associate, Nick Olsher
3 who spent years as a health physicist at Los
4 Alamos and retired recently -- still works
5 part-time and he works for us -- had a
6 discussion. Suddenly, I remember now.

7 We had this Allis-Chalmers
8 betatron at Los Alamos years back and he said
9 -- now it's coming back to me.

10 I went in there. I was curious
11 what was going on. One or two minutes after it
12 was shut off, I went in there. So you have
13 another report.

14 DR. MAURO: Isn't there some
15 language in the manual to the effect that says
16 --

17 DR. ANIGSTEIN: No. The manual says
18 the tube is radioactive; not that there is
19 activity six feet away. It simply said don't
20 touch. It didn't say stay out of the room. It
21 just said don't touch the tube, meaning for
22 purposes of replacing it.

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1 CHAIRMAN ZIEMER: The tube's
2 activation.

3 DR. ANIGSTEIN: Yes, yes. There
4 would be activation. The tube has to be
5 replaced.

6 CHAIRMAN ZIEMER: Well, we won't
7 solve that right here.

8 MR. ALLEN: No. We've tried to look
9 into that too and managed to find one Russian
10 paper that talked about a 35 MeV betatron
11 machine, uncollimated, and it measured
12 activation in the copper -- copper-62. But
13 the dose rates they were coming up were very
14 small and it's a nine point something minute
15 half-life, which doesn't correlate well with
16 the description we have.

17 DR. ANIGSTEIN: There is a copper-
18 65 isotope which also Mr. Olsher pointed out.
19 It's very common in accelerators in general
20 for the copper windings. But that has a five
21 minute half-life so that doesn't suit -- that
22 doesn't say, do nothing in 15 minutes.

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1 MR. ALLEN: And then the other
2 thing I found that could explain it but it's
3 very vague is that accelerators were known --
4 you know, the high magnetic fields and the RF
5 frequencies were known to cause interference.

6 CHAIRMAN ZIEMER: Well, that's
7 something that's highly likely with the 15 mR
8 per hour.

9 I've done activations on medical
10 accelerators which are more energetic than
11 this Allis-Chalmers and you get activation of
12 the collimation stuff used in alloy. It's got
13 a lot of different elements in it.

14 You have to be almost in contact
15 to make the readings. There are a few mR per
16 hour right immediately after a run. Therapy
17 runs can be fairly long sometimes so, you
18 know, they're activated, but see, it's short-
19 lived stuff that all comes to equilibrium
20 pretty fast.

21 It's not like you're building it
22 up for hours and hours. There's an equilibrium

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1 and then it's gone in a few minutes. You
2 couldn't see it at six feet typically.

3 But for sure, there's going to be
4 activation. That's something that can be
5 characterized readily and -- well, anyway, we
6 need some kind of response to that though.

7 I mean, even if you say, well, we
8 don't know, it's a real -- I mean, you can
9 take Bob's analysis, which is very recent. I
10 read through it. You have that. That's got to
11 remain open still.

12 DR. MAURO: When I was talking to
13 Bob about the report and Bob was explaining to
14 me some of the limitations of MCNPX and the
15 situation we're in where in effect what we
16 have is to the best of our ability to try to
17 model this, we really can't figure out the
18 reason why we're seeing that someone
19 experienced 15 mR per hour became like the way
20 it is.

21 So what do we have as a
22 circumstance where we have a worker that has

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1 made some measurements, who has reported --

2 DR. ANIGSTEIN: An engineer.

3 DR. MAURO: An engineer.

4 MEMBER MUNN: Engineers are workers
5 too.

6 DR. ANIGSTEIN: In this report to
7 Sam Glover.

8 DR. MAURO: Right. Now, when we're
9 in a circumstance like that -- this is Bob and
10 I having a conversation -- reality is we have
11 to use that information. That is, we have to
12 give the benefit.

13 We don't know enough about the
14 capability of MCNPX to say with certainty that
15 we really know and we've caught everything and
16 that it captures everything that happened.

17 We have a person that gives us a
18 credible report. I think we have no choice but
19 to accept that.

20 DR. ANIGSTEIN: And in addition, we
21 model -- we're modeling for this purpose,
22 modeling for the original calculation -- so we

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1 just did a simple model.

2 The only thing in our model is the
3 platinum target and the tube. Now the machine
4 itself is a big, mammoth machine. We didn't --
5 we left the rest out because it was just too
6 complicated and we just didn't feel it was
7 worth the labor.

8 So again, the copper coils, the
9 magnet, the steel, the fixtures -- we're
10 talking about something that weighs probably a
11 pound as opposed to the whole thing that
12 weighs probably a ton. So we're only having a
13 very small fraction of the apparatus.

14 CHAIRMAN ZIEMER: Well, you're not
15 going to beam out if you're hitting the rest
16 of the apparatus.

17 DR. ANIGSTEIN: No, of course not.
18 But there is a lot of side -- the neutrons
19 come up in all directions. We were only
20 interested in the beam at the time we did
21 this.

22 But I'm saying in the original

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1 model, we used the same model that we
2 originally constructed to get the beam and we
3 didn't bother -- so besides the fact that
4 MCNPX may not be -- because it's a new
5 feature. It may not be completely accurate in
6 characterizing the new nuclides.

7 We didn't even create a complete
8 model of the whole machine. That's what I'm
9 saying.

10 CHAIRMAN ZIEMER: Do you know if
11 the neutrons come off from --

12 DR. ANIGSTEIN: From the target?

13 CHAIRMAN ZIEMER: -- uniform
14 target?

15 DR. ANIGSTEIN: Oh, I don't know
16 the target. I don't know the direction.

17 CHAIRMAN ZIEMER: I don't know.
18 Sometimes that's pretty --

19 DR. ANIGSTEIN: I do not know the
20 directions.

21 DR. GLOVER: This is Sam Glover.
22 The neutrons are highly biased on those

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1 targets.

2 CHAIRMAN ZIEMER: In the forward
3 direction?

4 DR. GLOVER: Yes. It's actually
5 very well described in Schuetz's document.

6 CHAIRMAN ZIEMER: I would have
7 thought. So you're not going to get a lot of
8 activation back into the machinery?

9 DR. NETON: Sam just sent me an e-
10 mail. He's online as well, but he states --
11 and I think Bob brought this up before, that
12 there is the same betatron machine at an Army
13 depot.

14 DR. ANIGSTEIN: Yes, in
15 Pennsylvania.

16 DR. NETON: And his own contract
17 there? We'll have to visit him.

18 DR. ANIGSTEIN: We discussed that
19 in one of -- I've been recommending that ever
20 since 68.

21 But however, discussed that with
22 John and we said, suppose we go, suppose we

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1 get permission and all of that and we go to
2 Letterkenny and somebody from NIOSH drives out
3 and somebody from SC&A such as myself drives
4 from New York which is a convenient place to
5 meet and we find nothing.

6 This is 2010. How can we say with
7 certainty what that machine in 1960-odd was
8 configured. The circuitry changes
9 periodically, upgraded, so they could have put
10 in a shorting circuit to kill the accelerator.

11 CHAIRMAN ZIEMER: Sure, and if
12 you're looking at electromagnetic, it could
13 have been a Faraday shield or something.

14 Okay, well, we'll need to address
15 something there.

16 DR. GLOVER: This is Sam Glover.
17 Very briefly, Schuetz has a side business --
18 the man who wrote the document. He maintains
19 these instruments. That's what he does on the
20 side.

21 I think if there's really anybody
22 who can kind of ascertain if anything has

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1 changed or is it kind of similar, there is a
2 thread if we want to really look at it. So
3 that's all I'll say.

4 DR. NETON: Sam, we'll get together
5 after this and figure out where we want to go
6 to try to --

7 CHAIRMAN ZIEMER: In part, the
8 burden will be on NIOSH again to figure out
9 what do we do with this information.

10 DR. NETON: Right, and I think the
11 key issue was that SC&A was concerned that the
12 photons were low energy, 60 KeV and down and
13 that would be an issue with correcting the
14 badges.

15 CHAIRMAN ZIEMER: Right. Issue 9
16 was -- I have a note that SC&A was considering
17 withdrawing this. Let me look at that a
18 moment.

19 DR. ANIGSTEIN: We withdrew our
20 withdrawal.

21 CHAIRMAN ZIEMER: Oh, you withdrew
22 your withdrawal, okay. Yes, there is a NIOSH

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1 or an SC&A response here.

2 DR. ANIGSTEIN: That's the second
3 part of -- the last part of this report that I
4 sent out on Sunday.

5 CHAIRMAN ZIEMER: Workers may have
6 handled uranium on its way into and out of the
7 betatron but were not assigned a dose to
8 reaction and consequently were not assigned
9 any skin dose. Is that the comment?

10 DR. ANIGSTEIN: That's part of it,
11 yes. Also, the quick -- we jumped to a quick
12 conclusion during a coffee break during the
13 last Work Group meeting.

14 We asked if the Putzier effect
15 would not apply to GSI. Based on the
16 discussion we had earlier today with regard to
17 TBD 6000, that it might apply. We had some
18 recasting at Mallinckrodt or Weldon Spring and
19 there were sufficient delays between the
20 purification of the uranium and the remelting.

21 It doesn't have to be, you know,
22 100 days for 96 percent. If it's 24 days, you

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1 get 50 percent. Since it's a fifteen-fold
2 effect, even if we have a five-fold effect or
3 a double effect, it's still something that
4 could be significant.

5 CHAIRMAN ZIEMER: Well, again, I
6 think we need to find out what NIOSH -- if
7 they disagree with that or concur with that or
8 what.

9 DR. NETON: I'm always trying to
10 remember what we --

11 DR. MAURO: I think it comes down
12 to -- when you folks originally did your
13 analysis, I guess this Putzier effect was not
14 explicitly addressed.

15 You're basically looking at slices
16 and you look at the slice and forget about the
17 Putzier.

18 When we did it, we had a slice
19 also, between we had an edge to have Putzier.
20 But now, I think from information that we've
21 received from Dan and John, there's a good
22 likelihood that these large castings showed

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1 up, are being shot and now all of a sudden,
2 it's not just a little band of four inches
3 wide, it's the full whatever the dimensions
4 are which makes it a larger source.

5 So I guess my simple understanding
6 of the matter is, well, the exposure from that
7 source could go up to a degree several-fold
8 because instead of being -- well, first of
9 all, it's the Putzier effect, I mean, you've
10 increased it because of that.

11 Not only that, it's not just a
12 slice, but it's the whole thing that's there,
13 which changes the exposure setting.

14 DR. NETON: I think earlier in the
15 day, we agreed to revise our write-up in TBD-
16 6000 about the Putzier effect and all these
17 different forms.

18 MR. ALLEN: I've just kind of
19 looked up -- because I'm pretty sure when we
20 exposed the beta dose and the uranium, I think
21 we used the TBD-6000 value. I might be wrong.
22 I'm still looking here.

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1 DR. NETON: Right.

2 MR. ALLEN: Okay, you've got it
3 covered.

4 DR. NETON: Still need to amend
5 TBD-6000 when it describes --

6 DR. ANIGSTEIN: I can't get HHS
7 mail or connect, but I do have it here if
8 someone has it -- I can give it to someone
9 else.

10 CHAIRMAN ZIEMER: What is that?

11 DR. ANIGSTEIN: I have -- I can't -
12 - Ted asked me to e-mail it to him and for
13 whatever reason, I can't connect to HHS mail.

14 MR. KATZ: The matrix.

15 DR. ANIGSTEIN: Pardon me?

16 MR. KATZ: Yes, so if Paul or
17 someone could put it on theirs and e-mail it
18 to me, that could work too.

19 CHAIRMAN ZIEMER: Is this the thing
20 for Dan?

21 MR. KATZ: Yes, it is. You have to
22 save it to the other and --

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1 DR. NETON: I can't access my C
2 drive at all.

3 MR. KATZ: That's weird. I can't --

4 CHAIRMAN ZIEMER: Do you want to
5 bring that over here? We've got too many
6 people talking at a time for the Court
7 Reporter.

8 Dan, we haven't been successful
9 yet, I guess, in getting this out.

10 DR. ANIGSTEIN: It's not a simple
11 thing but if it's encrypted.

12 CHAIRMAN ZIEMER: This is
13 encrypted?

14 DR. ANIGSTEIN: Right. That's what
15 I was told.

16 CHAIRMAN ZIEMER: In what sense is
17 it encrypted?

18 DR. ANIGSTEIN: You have to run a
19 program.

20 MR. KATZ: Why don't you do it with
21 Mark so that Paul can -- do it with Mark's
22 computer. That way Paul can --

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1 CHAIRMAN ZIEMER: Okay --

2 DR. MCKEEL: Don't worry about it.
3 I'll -- you all need to get your work done.

4 CHAIRMAN ZIEMER: We're going to
5 get it done one way or the other.

6 DR. MCKEEL: I appreciate the
7 effort.

8 CHAIRMAN ZIEMER: An issue -- okay,
9 that was issue 9. Issue 10, the NIOSH
10 response was that this was not an SEC issue.
11 It has to do with accuracy of dose estimates
12 and therefore it's really an Appendix BB
13 issue.

14 Well, it's lack of consistency in
15 the signing external exposures, so it has to
16 do with the modeling. It probably should be
17 moved to the Appendix BB matrix.

18 So let's agree to do that and then
19 we will need -- and see NIOSH's response to
20 SC&A was move it, but they weren't responding
21 to the issue so you will need a -- this will
22 need to become a new issue under Appendix BB.

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1 We'll agree to move issue 10 to Appendix BB
2 and address it there.

3 And that's the assignment of
4 external exposure, so to some extent, you're
5 going to be covering that anyway in your other
6 issues, Dave.

7 MR. ALLEN: Yes, I think our
8 response is going to be --

9 CHAIRMAN ZIEMER: -- take care of
10 this one.

11 The next thing I had on our list
12 here was to identify or consider any related
13 petition or concerns on the SEC petition so,
14 Dan, again, I want to ask you if you have
15 additional items that you want to call our
16 attention to outside the matrix itself or
17 within the matrix as well. That's fine.

18 DR. MCKEEL: Paul, this is Dan
19 McKeel again. I prepared a document that I
20 sent to you all. It has to do with the various
21 documents at GSI. What I intended on that was
22 that that also included the SEC matrix. I did

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1 have some additional items that concerned me,
2 but I don't have that with me and ready to
3 discuss today.

4 CHAIRMAN ZIEMER: I do know that
5 you -- to some extent, you covered some of
6 those in the document that we already went
7 through.

8 DR. MCKEEL: You did. I did.

9 CHAIRMAN ZIEMER: So I was just
10 saying are there any other ones that --
11 certainly you'll have the opportunity because
12 we have a lot of work to do on this matrix
13 yet.

14 DR. MCKEEL: I think we've covered
15 them. The overarching issue, as far as I'm
16 concerned, that has to do with the SEC
17 petition is really two things.

18 One -- and I understand that
19 they're being addressed -- but one is that we
20 do not have monitoring data for 10 of the 13
21 years of the covered period. That's big.

22 Second one is that even in the new

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1 White Paper, not all of the radiation sources
2 have been covered. Again, if everyone accepts
3 the testimony that there was an iridium-192
4 source, that hasn't been modeled or the dose
5 calculated.

6 And if one accepts that there were
7 -- and this was in the license -- that there
8 were two, at least, portable conventional
9 industrial x-ray sources there, and the fact
10 that they literally could have been used
11 anywhere in the plant, then I think those
12 doses also have to be calculated. So the
13 sources need to be determined, all of them.
14 But I assume that that will come out as the
15 work progresses.

16 CHAIRMAN ZIEMER: Right. I think
17 those -- I'm looking back here in the matrix -
18 - as to whether those are explicitly
19 incorporated into the findings but certainly
20 those will come out in terms of the issues
21 we've already discussed for Appendix BB.

22 DR. MCKEEL: Okay, that's fine.

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1 CHAIRMAN ZIEMER: Thank you.

2 DR. MCKEEL: Thank you.

3 CHAIRMAN ZIEMER: I think we've
4 identified the path forward on the items as
5 we've gone along so we're okay on that. I do
6 want us to turn to Bliss and Laughlin. Sam
7 Glover, are you still on the line?

8 DR. GLOVER: Yes, sir.

9 CHAIRMAN ZIEMER: Sam, at our last
10 meeting, we learned -- and I don't know if the
11 Petitioner is on the line or not. Is the
12 Petitioner for Bliss and Laughlin on the line?

13 At our last meeting, we learned
14 that the Petitioner had a different version of
15 the Evaluation Report than the one we were
16 using.

17 In the transcript of those
18 minutes, what we said was that the Petitioner
19 would mail his version of the Evaluation
20 Report to Ted so that Ted could identify why
21 his copy was different from the covered -- it
22 was different about the covered dates and the

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1 levels.

2 MR. KATZ: Never received anything.

3 CHAIRMAN ZIEMER: So you never
4 received that, Ted, apparently. Somehow he
5 had a document and he read to us from it. What
6 he read for the covered period was very
7 different than -- I mean, it was different. It
8 was different from the official covered
9 period.

10 Then the other thing in the
11 transcript was it said that NIOSH would
12 indicate whether they intend to do another
13 data capture to look -- oh, that was related
14 to -- that wasn't related to Bliss and
15 Laughlin. That was for the other facility.

16 There was an indication and I
17 don't know if this has occurred. John, you
18 talked about the possibility that you would be
19 meeting with former workers?

20 DR. MAURO: On Bliss and Laughlin?

21 CHAIRMAN ZIEMER: Yes.

22 DR. MAURO: Yes. That's -- we're

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1 trying to schedule that in.

2 CHAIRMAN ZIEMER: That hasn't
3 occurred yet.

4 DR. MAURO: That has not occurred.
5 It's in the queue but it hasn't occurred yet.

6 CHAIRMAN ZIEMER: We wanted to
7 determine whether a formal review and findings
8 matrix was needed for Bliss and Laughlin. I
9 think part of that was going to await what you
10 learned from the workers.

11 DR. MAURO: We have a Bliss and
12 Laughlin SEC Petition Evaluation Report review
13 completed. I think it's probably at DOE right
14 now. It was finished up and sent to DOE.
15 You'll be getting it when it comes back.

16 CHAIRMAN ZIEMER: So there would be
17 a findings matrix?

18 DR. MAURO: Yes, but there won't be
19 the attachment that includes the results of
20 the interviews because the interviews always
21 lag behind.

22 CHAIRMAN ZIEMER: Yes.

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1 DR. MAURO: But you will be getting
2 that as soon as it comes back from DOE.

3 CHAIRMAN ZIEMER: Okay. So probably
4 by the time of the next meeting, we would have
5 a findings matrix.

6 DR. MAURO: Oh, yes.

7 CHAIRMAN ZIEMER: In terms of the
8 Petitioner, I think the burden was on him to
9 send that in, but he knows that the document
10 he has was not correct.

11 MR. KATZ: This is a long time now.
12 I will get in touch with the SEC Petitioner,
13 Laurie Breyer, and find out if she can't speak
14 with him and sort this out.

15 CHAIRMAN ZIEMER: Do you know who
16 it is?

17 MR. KATZ: I don't, but I'll get
18 that from Laurie.

19 CHAIRMAN ZIEMER: Okay, all right.

20 MR. KATZ: Are there more than one
21 Petitioners for this site?

22 CHAIRMAN ZIEMER: Okay, so --

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1 DR. MCKEEL: Dr. Ziemer?

2 CHAIRMAN ZIEMER: Yes?

3 DR. MCKEEL: This is Dan McKeel.
4 I'm sorry to interrupt.

5 CHAIRMAN ZIEMER: That's all right.

6 DR. MCKEEL: I just noticed that
7 under item 4E, the interview that you had with
8 the site expert -- I don't think we covered
9 that. I just wanted to remind you that that's
10 on the agenda whether you want to cover that
11 or not.

12 CHAIRMAN ZIEMER: Well actually, I
13 put it on the agenda but I wasn't certain we
14 needed to cover it. Let me say why.

15 DR. MCKEEL: Okay.

16 CHAIRMAN ZIEMER: I have provided
17 copies of that interview to the members of the
18 Work Group.

19 DR. MCKEEL: That's great.

20 CHAIRMAN ZIEMER: I believe you
21 have a redacted copy.

22 DR. MCKEEL: Yes, sir. That's true.

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1 That's fine with me.

2 CHAIRMAN ZIEMER: It turned out in
3 my mind that much of what we did there was a
4 moot point since we found these other
5 documents which give us much more.

6 The original purpose of the
7 interview was to find out if we could
8 establish the size of the iridium source based
9 on distances used to rope off the area.

10 DR. MCKEEL: Yes.

11 CHAIRMAN ZIEMER: What I learned in
12 the interview was, 1) that that
13 individual was not actually involved with an
14 iridium source so I provided the other
15 information that he gave to me about the
16 sources he was familiar with. Plus, I think
17 there was information about the outside group
18 that came in and did some radiography.

19 But as far as I can see, there's
20 no information there that is more helpful than
21 that that you were able to gather from the
22 license materials.

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1 DR. MCKEEL: That's fine.

2 CHAIRMAN ZIEMER: Yes.

3 DR. MCKEEL: Okay, thank you.

4 CHAIRMAN ZIEMER: We do all have a
5 copy of that.

6 DR. MCKEEL: Yes, okay, good.

7 CHAIRMAN ZIEMER: Okay, thank you.
8 Let me ask if there's any other items that
9 need to come before us today?

10 MR. THURBER: Mr. Ziemer, this is
11 Bill Thurber.

12 CHAIRMAN ZIEMER: Yes, Bill?

13 MR. THURBER: A comment on the
14 Bliss and Laughlin report which you all will
15 be getting momentarily as John said, when you
16 get it, you will see that the analysis by
17 NIOSH and our critique of their analysis is
18 closely intertwined with TBD 6000.

19 Some of it deals with inabilities
20 to interpret what TBD-6000 says. Some of it
21 deals with unsubstantiated positions or
22 approaches to data taken in TBD-6000. Some of

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1 it deals with the fact that in one place, TBD-
2 6000 says do this. In another place, it says
3 do that.

4 I would hope that even though
5 these things are not necessarily or have not
6 necessarily been part of the TBD-6000 matrix,
7 that as the document does get revised by NIOSH
8 that these things will get picked up and be
9 corrected as well.

10 CHAIRMAN ZIEMER: Thank you for
11 that comment. I think that, for example, you
12 pointed out a contradiction within TBD-6000
13 that certainly whatever that is, we'll want to
14 take care of that and pick that up in any
15 revision.

16 The same would be true if there's
17 other issues outside of what we've already
18 talked about because we don't want to keep
19 doing iterative revisions every time we do a
20 TBD subset.

21 MR. THURBER: Exactly.

22 CHAIRMAN ZIEMER: So we appreciate

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1 getting those early on and then --

2 DR. MAURO: They're close.

3 CHAIRMAN ZIEMER: Particularly if
4 there's something that's very obvious. When
5 you talk about a contradiction, it seems to
6 say do something this way and do something
7 that way.

8 MR. THURBER: Right.

9 CHAIRMAN ZIEMER: Or maybe it
10 doesn't and you think it does, so we'll find
11 that out.

12 MR. THURBER: Which may be true as
13 well. Exactly.

14 CHAIRMAN ZIEMER: Very good. Any
15 other comments?

16 (No response.)

17 CHAIRMAN ZIEMER: I thought we
18 would go to five-ish. Surely there's more
19 comments. Well, that's what happens when you
20 start an hour early. If not, I thank you all
21 again. I thank those on the phone who
22 participated, and we are adjourned.

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1 (Whereupon, above-entitled matter
2 went off the record at 4:10 p.m.)

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