

This transcript of the Advisory Board on Radiation and Worker Health, TBD 6000 Work Group, has been reviewed for concerns under the Privacy Act (5 U.S.C. § 552a) and personally identifiable information has been redacted as necessary. The transcript, however, has not been reviewed and certified by the Chair of the TBD 6000 Work Group for accuracy at this time. The reader should be cautioned that this transcript is for information only and is subject to change.

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

+ + + + +

ADVISORY BOARD ON RADIATION AND
WORKER HEALTH

+ + + + +

WORK GROUP ON TBD-6000

+ + + + +

THURSDAY
FEBRUARY 5, 2015

+ + + + +

The Work Group convened via teleconference at 11:00 a.m. Eastern Daylight Time, Paul L. Ziemer, Chairman, presiding.

PRESENT:

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

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ALSO PRESENT:

TED KATZ, Designated Federal Official
DAVID ALLEN, DCAS
ROBERT ANIGSTEIN, SC&A
DAN CHUROVICH
PATRICIA JESKE
JENNY LIN, HHS
JOHN MAURO, SC&A
DAN MCKEEL
JIM NETON, DCAS
DON PIPER
JOHN RAMSPOTT
JOHN STIVER, SC&A

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

(11:02 a.m.)

MR. KATZ: But I think we might as go ahead and start with roll call and I'll circle back for John when he gets here.

CHAIRMAN ZIEMER: Okay.

MR. KATZ: But let me just some preliminaries. So this is the Advisory Board on Radiation Worker Health, the TBD-6000 Work Group.

We're meeting to discuss GSI Site Profile revision issues. And the materials for this meeting are posted on the NIOSH website under the Board section schedules for meetings, today's date.

So people should be able to follow along with all the reports that are being discussed as well as, I have not checked to see if they've been posted yet because these don't get posted very quickly. But we're hoping that the presentations, which came in late, in other words came in this

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1 morning, can be posted at some point while we're
2 still meeting.

3 But anyway, we've asked for that.
4 We'll see what happens. That's not really under
5 our control.

6 Okay. Very good. So let me begin with
7 roll call. We're speaking about a site, so please,
8 for all agency affiliated people speak to conflict
9 of interest as well when you respond and let's do
10 roll call for the Board first.

11 (Roll call.)

12 And just for all, we have a number of
13 people who are not always on the call here.
14 Everyone on the line and all of you and the members
15 of the public as well, when you're not speaking,
16 please mute your phone because otherwise we end up
17 having audio issues.

18 So if you don't have a mute button on
19 your phone, press Star 6. That'll mute your phone
20 and that'll help a lot with this call. To take your
21 phone off of mute, you just press Star 6 again and
22 that'll take your phone off of mute. But please

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1 mute your phone so that everybody can listen and
2 hear well. Thank you. Dr. Ziemer.

3 CHAIRMAN ZIEMER: Okay. Thank you
4 very much, Ted and good morning, everyone. I'll
5 officially call the meeting to order.

6 I wanted to make a few preliminary
7 comments and also review the documents that are
8 before us today in terms of what they are and the
9 dates on those. So let me do that first and then
10 we'll get into the actual items on the agenda.

11 I just want to remind everyone that our
12 focus today is on Appendix BB, Rev 1. And the main
13 responsibility of the Work Group is to assess
14 whether or not this revision correctly and properly
15 incorporates the changes to Rev 0 that were agreed
16 to by the Work Group in our previous discussions
17 of the various issues.

18 And it's clear that we have a number of
19 editorial and factual information issues that have
20 been raised by both SG&A and by the co-petitioner,
21 Dr. McKeel.

22 And it's my understanding that NIOSH

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1 will make appropriate wording corrections and
2 factual corrections that are within the scope of
3 what Appendix BB is intended to do and to be. And
4 perhaps ask Dr. Neton to comment on that matter
5 later in terms of editorial changes.

6 As far as the technical matters are
7 concerned, including model assumptions and
8 actually matters of calculational issues, there
9 remain some items which need attention in order to
10 reach closure on actual reconstruction of doses.

11 So those are the issues that require
12 attention, I gather that we can move ahead in a
13 timely manner and reach closure on GSI dose
14 reconstructions.

15 Now, let me just review quickly the
16 issues for today and, hold just a minute. And is
17 everyone hearing me?

18 MR. KATZ: Yes. Paul, we can --

19 CHAIRMAN ZIEMER: Okay.

20 MR. KATZ: -- hear you. When you look
21 away from the phone or whatever, we lose you, but

22 --

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1 CHAIRMAN ZIEMER: Okay. In addition
2 to the agenda, which I imagine everyone has, let
3 me just go over the discussion papers that are
4 before us.

5 I'm not going to give them in the order
6 that they are on the website, but I am going to give
7 them in the order that we have received them in
8 terms of the calendar.

9 First of all, the Appendix BB Rev 1
10 itself, which is dated June 6th, 2014. But then
11 too, we have submissions from Dan McKeel called
12 Critique of GSI Appendix BB Rev 1, and that's dated
13 July 16th, 2014.

14 We have this SC&A Memo Review of Site
15 Profiles for Atomic Weapons Employers that Worked
16 Uranium Metals Appendix BB, General Steel
17 Industries, Revision 1. And that's dated December
18 10th, 2014.

19 And incidentally, I'll just mention
20 because this question has arisen, there was an
21 earlier version of that dated October 29th, 2014
22 in which, apparently, SC&A discovered they had made

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1 some errors on the numbers in the tables and they
2 reissued it with the correct numbers.

3 And if there's questions on that,
4 perhaps Bob Anigstein can delineate that more.
5 But the operational document is the December 10th
6 document.

7 And then we have NIOSH responses to
8 Sanford Cohen and Associates review of the TBD-6000
9 Appendix BB response paper, January 8th. And then
10 also NIOSH General Steel Industries Layout man Beta
11 Skin Dose Response Paper, January 8th 2015.

12 And we have SC&A memo Review of
13 Responses to Sanford Cohen and Associates of
14 Battelle TBD-6000 Appendix BB Response Paper,
15 January 26th.

16 We have Dan McKeel and John Ramspott
17 evidence of GSI non-compliance, which is really a
18 memo dated January 29th. We have some additional
19 correspondence on that also dated January 29th.
20 And then SC&A memo Review of General Steel
21 Industries Layout man Beta Skin Dose Response
22 Paper, January 30th.

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1 Also I have, but I don't think these are
2 on the document list, but I think were distributed,
3 Dan McKeel email addendum to non-compliance memo
4 dated January 30th.

5 And I believe I just got this morning
6 a John Ramspott email regarding, you know, I just
7 recall up the betatron form and I'm not going to
8 put a name yet at this time. I'm not sure where
9 we are on that. But that's dated today, 2/5/15.

10 And then we have two PowerPoint
11 summaries that I have just seen from Bob Anigstein
12 and I believe those are just summaries of the two
13 SC&A memos that were mentioned, the response memos.
14 So my understanding is they can be used as for ease
15 of following his comments today.

16 My understanding, those have been
17 distributed to our Board Members and I believe to
18 Dr. McKeel and Dr. Ramspott. I assume to Ms. Jeske
19 as well.

20 MR. KATZ: That's correct, Paul.

21 CHAIRMAN ZIEMER: Okay. So that's
22 where we are in this document. Do you have any

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1 questions on documents? Okay.

2 MR. KATZ: Before we go on, can I just
3 make a note? Someone has maybe a speaker phone on
4 or something and it is echoing Paul's and
5 everybody's remarks. If you could perhaps mute
6 your phone that would solve it. Thanks.

7 CHAIRMAN ZIEMER: Some echoing, I'm
8 hearing echoing, too. Okay. Let's go then to
9 SC&A. First of all, we're talking about your
10 initial comments on the Appendix BB, Rev 1.

11 And I do note that, basically, you had
12 a number of editorial things. And I believe that
13 NIOSH has already agreed to handle editorial
14 things, but maybe this would be a good time for Dr.
15 Neton just to comment on that.

16 DR. NETON: Yes, Dr. Ziemer. We
17 definitely will consider any editorial comments
18 that were made, I think in particular by Dr. McKeel,
19 related to clarification or correction of any
20 factual inaccuracies. And that'll be taken care
21 of in Revision 2 that will be upcoming.

22 CHAIRMAN ZIEMER: I bring that up

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1 because I would like us to focus on the technical
2 issues. I know that SC&A, you also have comments.
3 Some which, you pointed came from Dr. McKeel and
4 you had some additional ones on wording and that
5 sort of thing.

6 So I'm hoping we will spend time on what
7 that wording is going to look like. Let me just
8 ask, any Members of the Board have any concerns
9 about the editorial comments before we go any
10 further? Because if not, we'll focus on the
11 technical end. And that's where I would like SC&A
12 to begin, with their initial technical issues --

13 DR. MCKEEL: Dr. Ziemer --

14 CHAIRMAN ZIEMER: -- for their initial
15 review.

16 DR. MCKEEL: -- this is Dan McKeel.

17 DR. ANIGSTEIN: Yes, this is Bob
18 Anigstein. I'm trying --

19 CHAIRMAN ZIEMER: Oh.

20 DR. ANIGSTEIN: -- to get --

21 CHAIRMAN ZIEMER: Hang on. Dr. McKeel
22 did you have a comment there?

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1 DR. MCKEEL: Dr. Neton, I say that it's
2 a complete inaudibility when he spoke.

3 CHAIRMAN ZIEMER: Oh, okay.

4 DR. MCKEEL: Yes.

5 CHAIRMAN ZIEMER: Jim, could you
6 repeat?

7 DR. NETON: Yes. We will definitely
8 consider any editorial comments that have been made
9 either by Dr. McKeel and/or the ones that were
10 identified by SC&A in the revision to Appendix BB,
11 Revision 2 that will be coming out, hopefully soon.
12 Is that better?

13 CHAIRMAN ZIEMER: Okay.

14 DR. NETON: This phone is not working
15 real good, I guess.

16 MEMBER MUNN: Yes, the quality is not
17 terrific, Jim.

18 DR. MCKEEL: Dr. Ziemer?

19 CHAIRMAN ZIEMER: Yes.

20 DR. MCKEEL: Yes, it's the same
21 problem. At best it's okay and then Dr. Neton
22 fades in and out. And the fade out, it's to

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1 inaudibility, cannot hear him.

2 CHAIRMAN ZIEMER: Oh, okay.

3 MR. KATZ: It's clear as a bell on my
4 end. So I'm not sure how much is people's
5 individual phone systems or what, but.

6 DR. NETON: This is --

7 CHAIRMAN ZIEMER: Yes.

8 DR. NETON: -- Jim. I'm going to go to
9 another telephone. It might work better for me.
10 So I'll be back --

11 CHAIRMAN ZIEMER: Okay.

12 DR. NETON: -- within about five
13 minutes.

14 CHAIRMAN ZIEMER: Okay. We'll have
15 him repeat that, Dr. McKeel, when he gets back on
16 the line.

17 DR. MCKEEL: Thank you very much.

18 CHAIRMAN ZIEMER: Okay. Go ahead,
19 Bob.

20 DR. ANIGSTEIN: Okay. Can everybody
21 see my screen?

22 DR. MCKEEL: Yes.

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1 DR. ANIGSTEIN: Good?

2 MEMBER MUNN: Yes.

3 DR. ANIGSTEIN: Good sign. Okay.

4 So, we have reviewed the Appendix BB Rev 1. And
5 I'm going to skip ahead and I hope Dave doesn't mind
6 because I see no point in discussing a finding which
7 has already been resolved later.

8 So I'm just going to summarize both our
9 findings and the NIOSH responses particular when
10 there's complete agreement. And then we can just
11 focus in on the ones where there's still some, you
12 know, discussion remaining.

13 So I'm just going to go through the
14 list. The first one is neutron dose rates, which
15 were simply, they're correct, but they're stated
16 in units of effective dose, which is not something
17 that NIOSH can use for finding organ doses.

18 So they've agreed and actually SC&A
19 furnished to NIOSH the calculations using the
20 $H^*(10)$, the personal dose equivalent. So that is
21 usual, they can elect to use that or do their own
22 calculation, but that's a non-issue now.

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1 Then the Finding 2, those are going to
2 require more discussion. We observed that the
3 dosage of the betatron operator, which were listed
4 in Rev 1 are somewhat different than the ones that
5 SC&A had calculated and had included in the report
6 last January, the two reports, last December of
7 2013, January 2014. And there was some
8 differences that were not readily explained.

9 However, apparently that's moot now
10 because NIOSH said they no longer agree to the beta
11 doses that had been agreed on. Even though there
12 was some numerical differences, they have a new
13 approach and I will get into that in a moment.

14 The Finding 3 is, this was pointed out
15 by Dr. McKeel, that there was no -- but actually
16 there was a couple of workers that reported to
17 another worker, now deceased, who sent an email
18 saying that these former workers recalled and one
19 of them was actually involved in constructing this
20 radiographic cement block structure inside the
21 Number 6 building.

22 And we had assumed that it was always

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1 in place and took credit in our analysis which NIOSH
2 also concurred in that the radiographer will be
3 sitting in a little room inside that building and
4 there will be some shielding between him and the
5 radium source.

6 And it turns out this building did not
7 exist. It was built something in 1955, so
8 therefore the triangular distribution of photon
9 doses needs to be corrected. And NIOSH has agreed
10 to that, so again, that is not an issue.

11 And then there was just probably more
12 of a typo than anything else, that the maximum of
13 the triangular distribution was set to the, then
14 applicable, AEC limit.

15 And the AEC limit was 15 rem, 15 R daily,
16 according to 10 CFR 20 of the time, this explicitly
17 state that a roentgen and a rem are the same, which
18 of course, that's no longer the health physics
19 practice.

20 But at any rate, the limit for 16 rem
21 through 1960 and January 1st, 1961, it became
22 effectively 12 rad or 12 rem. And there was an

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1 error in Appendix BB Rev 1 and, again, NIOSH has
2 agreed that the limits for 1961 should be 12 not
3 15.

4 Then, Finding 5, it's still an area of
5 disagreement where we find that the same
6 radiographer using the radium-226 sources, because
7 they were only doing it 30 percent of the time,
8 could also have been working in the betatron at the
9 same time. And this is something that NIOSH
10 disagrees with.

11 And Finding 6, the beta skin doses to
12 layout man are significantly lower. We had not
13 actually submitted, but had not recently, meaning
14 the last several years, recalculated the dose beta
15 skin dose to layout man.

16 We did recalculate them in the process
17 of reviewing the Rev 1 and found that we had lower
18 doses than those listed. But, again, it's a moot
19 point because NIOSH has now announced they have a
20 different model that came out in a later report.

21 Finding 7 was apparently just a
22 calculational error of the inhalation during the

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1 first six months of 1966. The dpm per calendar day
2 was handled as if 1966 was a full year, but the
3 actually it was only a half-a-year. The
4 operational period ended on June 30th. So there
5 was an error of a factor of two, which NIOSH has
6 acknowledged and agreed we'll fix.

7 Finding 8, we found that the ingestion
8 intakes were not consistent with the OCAS-TIB-009,
9 which SC&A had concurred. We had reviewed of a
10 TIB-009 and agreed with it and now, the ingestion
11 was based on, actually, much higher. It will
12 predicative of OCAS-TIB-009. And NIOSH has agreed
13 to revise that, in this case, downward, to make it
14 consistent.

15 Then, the Finding 9 was simply, again,
16 like a spreadsheet error where the ingestion
17 intakes during residual period should have been
18 based on the last year of the operational period.
19 And then there is the, I believe, it's OTIB-52,
20 which has an exponential decrease year by year.

21 And they simply started with the wrong
22 number. They took the inhalation intake instead

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1 of an ingestion intake. And they agreed that there
2 was an error that would be found.

3 And then finally, Finding 10, we did not
4 catch at the time of initial review. But it's
5 similar to Finding 1. It's that the betatron
6 operators assumed to be exposed to this residual
7 radiation from the betatron after it's shut off.

8 And we're calculating units of
9 effective dose and, again, that has to be restated
10 in different units. So here's the actual
11 resolution, so I'm duplicating myself.

12 Finding 1, NIOSH has agreed to revise
13 those resolutions. Finding 2, NIOSH will
14 recalculate it. They have not done that yet, so
15 we have not seen the results of this model they
16 intend to use.

17 Finding 3, the concurrent, I'm saying
18 DCAS because that's how they refer themselves.
19 For consistency some of them say NIOSH some of them
20 say DCAS, we know the difference.

21 Then, so Finding 3 is they're basically
22 in agreement. They actually came up with a very

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1 slightly higher number than we did because
2 different assumptions about the exposure time.
3 But there is a couple of percent difference and
4 there's no disagreement here.

5 And then Finding 4, they intend to
6 address that and revise it. 5, there was
7 continuing disagreement and we'll get to that
8 later.

9 Finding 6, there was continuing
10 disagreement, this is significant disagreement.

11 Finding 7, 8 and 9, essentially there
12 was concurrence. And Finding 10, NIOSH hasn't
13 seen until recently, so they naturally could not
14 have responded to it.

15 Okay. Then we're going to the
16 unresolved findings now. So this is a table based
17 on the SC&A numbers were taken from our report of
18 December 10th, NIOSH numbers were taken from the
19 Appendix BB, Rev 1.

20 And there are small differences during
21 the year up through 1963 that are not significant,
22 different. I'm not sure the source of these

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1 differences are, but there are small differences.

2 And then they become more significant,
3 64, 65, 66 where the doses to hands and forearms
4 and then more significant for what they call it
5 whole body, I call it other skin because it's
6 excluding the hands and forearms.

7 MR. KATZ: Bob, this is Ted. Can I
8 interrupt you for two things?

9 DR. ANIGSTEIN: Sure.

10 MR. KATZ: Sorry. I mean, the main
11 thing is if you would orient the people who can't
12 see this as to which document you're referring to,
13 that'd be helpful.

14 And while I'm interrupting, I might as
15 well just note, Dr. Poston did join the meeting.
16 He's been on the meeting for, you know, maybe ten
17 minutes or so and he does not have a conflict of
18 interest. But I wanted to just get that in so that
19 the record is clear. Thanks.

20 DR. ANIGSTEIN: Right. Well, I'm
21 going through the briefing. The one I'm using is
22 not numbered. I think it's about the fifth or

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1 sixth page, detailed discussion of unresolved
2 findings is the heading on it.

3 CHAIRMAN ZIEMER: You're actually on
4 the fourth page, Bob.

5 DR. ANIGSTEIN: Fourth page. Thank
6 you. I put numbers on the one, the ones that were
7 distributed. I thought it was unsightly to have
8 them here, but leaves me at a disadvantage. So I
9 probably shouldn't have done that.

10 So is that okay? Any questions on
11 this? Okay. So again, this is only the
12 disagreement with the Appendix BB, Rev 1.

13 Now, NIOSH did make the point and we
14 agreed that in our earlier document, the one from
15 December of 2013, we didn't change the model, but
16 there was a spreadsheet slip up where the betatron
17 operator was assumed to be one foot, depending on
18 whether we're talking about the hands and forearms
19 or the other skin was either in contact or one foot
20 away 50 percent of the time and in both cases it
21 was at one meter the other 50 percent of the time.

22 Now, very early in the game back in

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1 2008, we didn't do the one meter calculation
2 because at that time the running MCNP was slow and
3 tedious and at that distance and we thought that
4 it is probably not a significant amount.

5 Then later we went back and redid the
6 calculation until we got much better computer
7 equipment during the meantime and we found that it
8 did make a significant contribution, a few percent.
9 I mean, that's whether it was significant or not.

10 However, due to a slip up in the
11 spreadsheet, it did not get added in to the numbers
12 we submitted in December. However, we did give
13 NIOSH and the Board all the data necessary to do
14 the numbers.

15 We said this is the dose per shift at
16 contact, at one foot and then one meter. So it was
17 a very straightforward matter to add into one meter
18 even though it said it was our numbers didn't
19 reflect that.

20 So I'm not sure what the reason for the
21 difference is with NIOSH's here. But again, this
22 has now been overtaken by later events. This is

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1 more of a historical -- okay.

2 Then the layout man -- this is for the
3 betatron operator. Then for the layout man, the
4 difference is now NIOSH has two sets of values. We
5 had the hands and forearms and the rest of the body
6 on doses here, 1.89, 1.14 rad per year. And you
7 better keep in mind that the layout man has already
8 been assigned 9 rad per year from direct exposure
9 to the number of the betatron beam.

10 So this is a small addition. This is
11 like another 15 to 20 percent increase. It's not
12 a radical increase. So NIOSH had separately
13 calculated these for the Appendix BB Rev 1 as .807
14 and .463 for hand and forearm and to the rest of
15 body.

16 And then in the latest response paper,
17 they revised that. They made a change in the model
18 and revised that downwards. So these numbers or
19 at least this approach, even though everything else
20 were different, this approach has been agreed to
21 at the Work Group meeting last January. It's a
22 year ago now. January of last year. And NIOSH has

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1 changed that.

2 Now, the other area of disagreement is
3 that simultaneous employment in the radium using
4 radium and the betatron. Now, what prompted us to
5 notice that, we had all agreed on what the photon
6 exposure should be, and at least for SC&A's -- but
7 we didn't stop to think what about the neutrons.

8 And today, only when I saw the table in
9 Appendix BB Rev 1 that assigned zero neutrons and
10 zero betas, I said wait a second, this doesn't seem
11 reasonable.

12 And the reason it's not reasonable is
13 that we know, for a fact, that at least in one case
14 the same radiographer did work with radium and in
15 the betatron.

16 And we said, first of all, the GSI
17 application for the AC license, they maximum
18 allowed, which should of -- I apologize, maximum
19 is used for actual exposure. So it could be less.

20 And the radiographer, therefore, in
21 theory had 70 percent of his shift left over to work
22 in the old betatron building with uranium and

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1 steel.

2 And the one GSI radiographer that
3 seemed to have a very clear memory of that period
4 and is not claimant for them, clearly he had no axe
5 to grind, did say, this is from the interview that
6 I conducted with him, he only worked weekends.

7 He had a different assignment during
8 the week. He was a lab technician and on weekends
9 he moonlighted for extra pay. And he did radium
10 and betatron radiography. According to his
11 recollection, 50 or 60 percent of the time in the
12 betatron.

13 And he worked, based on his account
14 which was, well, he may done one or two shifts on
15 the weekend meaning Saturdays or Saturdays and
16 Sundays or double shifts, whatever. And it was,
17 as he recalled, 80 to 90 percent of the time.

18 Well, if you take the two extremes of
19 that estimate, he could have worked as few as 40
20 shifts or as many as 90 shifts per year. And we
21 have a record of his exposure and it's a sum for
22 18 quarters, but his average is 2.02 R per year.

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1 So if we take this number of shifts and
2 change it to the 406 shifts assigned to a full-time
3 radiographer, the extrapolated dose is 9.1 to 20.5.

4 And so this is consistent. The 9.1
5 falls right in the middle of this triangular
6 distribution. The 20.5 falls outside it, so it's
7 probably an overestimate.

8 But the reason I bring this up, brought
9 it up before, is that it's plugged. Therefore, he
10 got a dose on the high side and yet, he spent 50
11 to 60 percent of his time in the betatron.

12 So consequently, dividing the time
13 between the radium and the betatron, first of all,
14 it was based on a real precedent and second of all,
15 it was not then mean, oh well, if you spent time
16 in the betatron, you'll get a much lower dose.

17 No, he gets the full dose for the radium
18 and working in the betatron. And if we accept, we
19 know on accepting this hypothesis is there would
20 be no change in the photon dose. That's already
21 been agreed to.

22 However, there would on top of the

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1 photon dose, we propose that the operators, the
2 plant personnel during the radium era, 1952 through
3 1962, be an addition assigned beta skin dose and
4 a neutron dose.

5 And this was calculated assuming that
6 because of the limited hours of uranium handling,
7 that hypothetical radiographer -- remember we're
8 talking about like EPA has a nice term for this when
9 they dose assessments, exposure assessments, they
10 refer to the maximally, okay, the RME, the
11 reasonably, maximally exposed individual.

12 So it was based on the upper ends of
13 what's realistic. And I think this the term I
14 would apply here.

15 So we assume that he did all of the
16 uranium radiography during a given year because
17 that took much less than 70 percent of his time.
18 But that's where most of the beta dose comes from.
19 So he would get that and then the remainder of his
20 70 percent, he would spend on steel radiography.

21 And given those numbers, he got a little
22 less than a full time betatron radiographer, but

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1 still a significant amount of beta dose to the hands
2 and forearms and to the rest of the body.

3 And likewise, he would get a neutron
4 dose, which is small, but it should be considered
5 because depending on the organ and the type of
6 cancer, neutron doses can play a much larger effect
7 than the photon doses. So even though they're
8 relatively small, they're potentially
9 significant. It should be considered a dose
10 reconstruction.

11 And then, finally, the residual photon
12 radiation with the betatron after it shut down was
13 expressed as effective dose, which was the numbers
14 were correct, but the units were not the useful
15 units.

16 So using exactly the same approach, the
17 approach here is based on the scenario. The thing
18 that we capitulate assumes that the betatron
19 operator has his back to the betatron apparatus,
20 therefore, the radiation reaching his badge that
21 is on his body, is filtered through his body.

22 And so we use as a surrogate for the

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1 badge, the female breast. And, then, so we take
2 the dose coefficients, and this a PA,
3 posteroanterior exposure, and this is taken from
4 ICRP 74, the dose coefficients, and we simply flip
5 a -- see the dose coefficients are already the
6 multiplier of the air kerma.

7 Basically for one gray of air kerma,
8 there is .0489 gray to the breast from 30 keV
9 radiation. And then, as you go in higher energy
10 this ratio increases because more and more
11 penetrating.

12 So if we simply flip that around and
13 said okay, the film badge got ten, and ten is
14 considered to be the limit of the detection, so if
15 we simply take the ten divided by .0489, we get 204.

16 And then if you assume there are higher
17 energies, you get less. So we stick to the 30 keV,
18 so it can't be any worse than that, and then, we
19 start with 30 gray, below 30 the dose coefficient
20 is listed as zero, nothing gets through.

21 And, so, now it becomes 204 millirad air
22 kerma as opposed to what we had before which was

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1 26 millirem effective dose, which is again, not a
2 useful metric for this purpose.

3 So this can be done because this is
4 listed in so that this becomes ten rad per year air
5 kerma. But that's not such a high dose. It sounds
6 very high, but for 30 keV photons, those
7 conversions factor in the OCAS-IG-001 is much less
8 than one. So it's not an overwhelming dose.

9 And besides, I mean, this is just up for
10 discussion. Everyone had previously agreed on the
11 26 millirem effective dose and now we're just
12 converting it into air kerma, which is a more useful
13 quantity for calculation. So, okay, this is end
14 of this, our first review.

15 CHAIRMAN ZIEMER: Okay. Thank you,
16 Bob. I want ask if Board Members have questions
17 on the material that Bob just presented? I don't
18 hear anyone?

19 MEMBER BEACH: No, this is Josie, I
20 don't have any.

21 MEMBER MUNN: No, nothing --

22 CHAIRMAN ZIEMER: Okay. Wanda?

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1 MEMBER MUNN: -- here.

2 CHAIRMAN ZIEMER: John? Okay. One
3 question, Bob, kind of a technical question. When
4 you mentioned the neutrons have more, sort of,
5 biological effect, I guess my question is if you're
6 saying that in terms of rad dose that's one thing,
7 if you're saying that in terms of the rem or sievert
8 dose that's a different --

9 DR. ANIGSTEIN: No, I was referring --

10 CHAIRMAN ZIEMER: -- thing.

11 DR. ANIGSTEIN: -- to the rem. And I
12 was --

13 CHAIRMAN ZIEMER: Presumably, you've
14 already corrected for that biological --

15 DR. ANIGSTEIN: Well --

16 CHAIRMAN ZIEMER: -- difference.

17 DR. ANIGSTEIN: -- it varies. I was
18 looking up, there is a -- I can't think of it at
19 the moment. Jim, you can probably, could help me
20 out. There is a document of, you could find it over
21 on our website, which is the results incorporated
22 in IREP.

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1 And there a document that gives a range.
2 But depending on the type of whether it's leukemia
3 or non-leukemia or solid cancer, there's actually
4 a distribution of --

5 CHAIRMAN ZIEMER: Well, that's already
6 built into it, isn't that?

7 DR. ANIGSTEIN: No, it's start off with
8 the rem --

9 DR. NETON: This is Jim.

10 DR. ANIGSTEIN: -- and then you use a
11 multiplier.

12 CHAIRMAN ZIEMER: Yes.

13 DR. NETON: This is Jim Neton. Can you
14 hear me now? I'm back on the phone by the way.

15 CHAIRMAN ZIEMER: Yes, Jim.

16 DR. NETON: That's clear?

17 CHAIRMAN ZIEMER: Yes.

18 DR. NETON: I think what Bob's talking
19 --

20 CHAIRMAN ZIEMER: Let me ask --

21 DR. NETON: -- about is --

22 CHAIRMAN ZIEMER: -- Dr. McKeel if he

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1 can hear.

2 DR. NETON: -- if I apply these
3 radiation effectiveness factors for various types
4 of emissions and energies and the neutron radiation
5 effectiveness factors are laid on top of the dose
6 when IREP is run. And the distribution, but they
7 can be quite large depending on the energy of the
8 --

9 CHAIRMAN ZIEMER: Yes.

10 DR. NETON: -- neutrons.

11 CHAIRMAN ZIEMER: But it is built into
12 the IREP already?

13 DR. NETON: Well, it's stripped out and
14 then added back in to the IREP calculation.

15 CHAIRMAN ZIEMER: Yes. Yes. Okay.

16 DR. NETON: I wasn't --

17 DR. ANIGSTEIN: My point, Paul, was
18 simply not that that's where you're pointing it,
19 just to point out that the neutron can be more
20 significant than it appears to be. Beta --

21 CHAIRMAN ZIEMER: Oh yes.

22 DR. ANIGSTEIN: -- and photon are given

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1 a factor of one.

2 CHAIRMAN ZIEMER: So, right.

3 DR. ANIGSTEIN: Whereas --

4 CHAIRMAN ZIEMER: Well, I guess before
5 the neutron isn't there --

6 DR. ANIGSTEIN: -- you're trying to
7 double --

8 CHAIRMAN ZIEMER: -- to start with.
9 Right. Right.

10 DR. ANIGSTEIN: No, the multiplier can
11 be as high as the double digits.

12 CHAIRMAN ZIEMER: Right. Right. Let
13 me ask, Dr. McKeel, could you hear Dr. Neton okay?

14 DR. MCKEEL: Yes, Dr. Neton, I don't
15 think I've ever seen a neutron RBE changing from
16 1 to 20.

17 CHAIRMAN ZIEMER: I think this is beyond
18 the RBE, I believe.

19 DR. MCKEEL: I see.

20 DR. NETON: Yes, the radiation
21 effectiveness factor is, they were described in our
22 documentation for IREP.

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1 DR. ANIGSTEIN: It's not the same, it's
2 not identical to the RBE.

3 DR. NETON: No, it's not. It's
4 similar but not the same if that makes any sense.

5 CHAIRMAN ZIEMER: Okay. Since, Dr.
6 Neton, you are back on the line here would you mind
7 at this point just repeating your comments about
8 editorial matters so Dr. McKeel could hear that
9 clearly?

10 DR. NETON: Yes, certainly. The
11 question was are we going to consider editorial
12 comments in the revision to Appendix BB, editorial
13 and factual and accuracy comments related to
14 factual accuracy and editorial comments in the
15 revision.

16 And the answer is of course we're going
17 to consider them in the next revision, Revision 2
18 which hopefully we will have issued shortly pending
19 on the outcome I guess of this discussion today.

20 DR. ANIGSTEIN: I have to, I should
21 just give an explanatory note on our report of the
22 original Appendix BB. We usually in reviewing the

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1 NIOSH document, we usually stick with the facts.

2 I mean this is what, these are usual
3 White Papers, position papers and they're just
4 stepping stones along the way to a conclusion. So
5 exactly how it's written, how it's stated is less
6 important than the conclusion whereas this one
7 being sort of a final document we thought and
8 besides, you know, Dr. McKeel has submitted his
9 comments and as a courtesy to him I checked every
10 one of his comments and those I thought were
11 applicable I passed it on.

12 We may not have gone into quite as much
13 detail if it hadn't been for Dr. McKeel's
14 commentary. So it's a fairly exhaustive editorial
15 suggestion and that's, you know, we can take a vote.
16 It can be taken for what it's worth.

17 CHAIRMAN ZIEMER: Right, okay. Thank
18 you very much. Now on our agenda and NIOSH will
19 have a chance to respond to these other ones in a
20 second here. But on the agenda I have Dr. McKeel
21 next because he had early comments on Rev 1.

22 Now, Dr. McKeel, as you make your

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1 comments here let me suggest on the editorial ones
2 unless there is some issue that's really
3 overarching that we focus mainly on technical
4 issues. And also I went through all of your
5 comments myself in detail and many of them deal with
6 issues that even since this Work Group has closed.

7 I understand and I have little
8 objection to you reiterating the concerns you had
9 in the past on those issues and I'm aware of those.
10 But we would like to, as much as possible, focus
11 on these technical issues that are needed to close
12 the dose reconstruction process.

13 So with those preliminary comments I
14 will give you the floor and, you know, use your
15 discretion as appropriate.

16 DR. MCKEEL: Dr. Ziemer, that's fine.
17 Can you hear me?

18 CHAIRMAN ZIEMER: Yes. You're kind of
19 faint.

20 DR. MCKEEL: Kind of faint, okay.
21 I'll speak up.

22 MR. CHUROVICH: I can't hear him at

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1 all.

2 DR. MCKEEL: How about right now? Is
3 it better?

4 CHAIRMAN ZIEMER: That's very good.

5 DR. MCKEEL: Okay. Let me make a
6 comment about my paper being primarily editorial
7 comments. I couldn't disagree with that more.

8 For example, among the editorial
9 comments that I mentioned in my paper, which by the
10 way SC&A was tasked to review, such things as I
11 pointed out that betatron operators were also
12 radium-226 operators and that should be included
13 in NIOSH's assignment of doses.

14 So it's not editorial. It's highly
15 technical. That's a big dose that NIOSH simply
16 left out and Dr. Anigstein just covered it. But
17 that's the kind of thing that I have in there.

18 I also have in there, which is not just
19 editorial, but reminding everyone that Dr. Neton
20 in November of 2013, wrote a memo to this Work Group
21 and to the full Board about the communications that
22 Stuart Hinnefeld has had with Craig Yoder of

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1 Landauer about the way control badge numbers were
2 handled.

3 And the conclusion of that memo, which
4 Dr. Neton wrote me about and I thought, I don't
5 accept what he said. I don't agree with it is what
6 it amounts too.

7 Here's what the last paragraph of his
8 memo says. And I think this is very difficult to
9 interpret but one way. He said based on Landauer's
10 practice of subtracting the control badge result
11 from itself the NIOSH proposed method for bounding
12 exposures to betatron workers at GSI cannot be
13 used.

14 In the second sentence to the last
15 paragraph is thus NIOSH proposes to adopt the
16 limiting value for exposure to betatron operators
17 proposed by SC&A which does not rely on the use of
18 film badge data. And my comments have been several
19 times and not answered, is this is, that film
20 badges, the NIOSH proposed method for bounding
21 exposures to betatron workers at GSI cannot be
22 used.

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1 Dr. Neton writes back to me and says
2 well I didn't really mean all the film badges
3 couldn't be used. But he said I was just referring
4 to control badges couldn't be used.

5 But the sentence in his memo that's on
6 the record that went to this Work Group and the
7 Board doesn't say that. It says the proposed
8 method for bounding exposures to betatron workers
9 cannot be used.

10 And then the next sentence I didn't
11 understand what that means. Thus NIOSH proposes
12 to adopt the limiting value, what limiting value,
13 for exposure to betatron operators proposed by
14 SC&A.

15 My question again, what is the limiting
16 value and in what SC&A paper title, date, year,
17 page, et cetera says that? So I think that memo
18 is, it's interpretable what it says that NIOSH
19 can't use, has decided not to use film badges for
20 bounding betatron operator exposures.

21 It doesn't say whether that's photon
22 exposures, neutron exposures. I assume it's one

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1 of those or both, but it doesn't say that. So my
2 general feeling and what I have asked happen is that
3 whole episode involved conversations between
4 Stuart Hinnefeld and Craig Yoder at Landauer.

5 And then Stuart Hinnefeld asked Dr.
6 Neton to write a memo to the Work Group. Well I
7 sent a FOIA request and got the same memo that I
8 already had back from them. What I did not get are
9 the original e-mails between Stuart Hinnefeld and
10 Craig Yoder.

11 And I still would like to have those.
12 But the more important point is not what Dan McKeel
13 gets but what you all have gotten. You all need
14 to see those original things and if it's true that
15 NIOSH has decided not to use film badges for
16 bounding betatron exposures that ought to be
17 acknowledged and that has far reaching
18 implications.

19 And I just heard Bob Anigstein from SC&A
20 recount and I wrote in my notes that the SC&A model
21 for and he was talking air kerma uses film badges.
22 You said ten rads per year air kerma was not really

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1 a high dose and so forth.

2 But there again, and this was my point
3 in Appendix BB1, I think that early memo takes film
4 badges out of the picture and there are doses
5 assigned in Appendix BB, Rev 1 that depend on film
6 badge data. So I don't think that's all, you all
7 once again, in my opinion, are rushing to close
8 these matters.

9 So anyway that's one comment, a small
10 part of it. My main, one of my main comments of
11 Appendix BB, Rev 1 and I don't think this is just
12 editorial I think this is actual, there's no
13 section in there that compares the previous doses
14 in Rev 0 with Rev 1.

15 And I think any scientific paper that
16 differs from the first one by a factor of seven
17 years ought to include that information. So I
18 still think that. The most troubling finding
19 about Appendix BB, Rev 1 that has emerged is that
20 number one, that should have been a final document.

21 It took seven years to produce that
22 document and now we get the document and we find

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1 that SC&A has nine findings, ten findings actually.
2 All but three of them are "resolved".

3 But actually the resolution involves
4 and I've heard it over and over this morning, that
5 was the telephone, sorry. Just a moment. Dr.
6 Ziemer, can you still hear me?

7 CHAIRMAN ZIEMER: Yes, I can hear you
8 fine, Dan. Go ahead.

9 DR. MCKEEL: I apologize. What I've
10 heard over and over this morning is that NIOSH
11 agrees and will make these changes in the next
12 revision of this appendix. Well I think that is
13 horribly, horribly unfair to all those denied
14 workers.

15 There may be several hundred of them at
16 GSI who will depend on having their doses
17 reconstructed and reopened under PER-057 and 057,
18 as I understand it depends on this Work Group
19 finalizing its findings. So if the response of
20 NIOSH is we'll make those changes later, we can make
21 those changes that's exactly what NIOSH told
22 everyone in December of 2012, when the SEC was

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1 denied by a nine to eight vote.

2 Lots of people said we can do that. We
3 are going to do that. And yet here we are in
4 February of 2015, you know, more than two years
5 after that vote and there are major issues that
6 aren't settled.

7 The beta skin dose is not settled. So,
8 you know, my feeling, let me sum up Appendix BB,
9 Rev 1. I think that SC&A was tasked to review that
10 paper and this is the first time I have ever heard
11 people talk about technical papers being
12 editorial.

13 I object to that term. I think it's a
14 solid, professional contribution where I address
15 Appendix BB, what its content is. You know, I'm
16 not talking about grammar and typos. I'm talking
17 to the content of the tables.

18 And, you know, I honestly think after
19 36 NIH grants and 31 years at Washington U in a
20 research group that was just awarded this past year
21 \$30 million more of grants for Alzheimer's disease,
22 I think I'm in an excellent position to make those

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1 sort of judgments and I do know how to write
2 scientific papers.

3 I think that my suggestions are being
4 overlooked and not dealt with. So any way I'm
5 going to finish my remarks. On Findings 2, 5 and
6 6, the ones with disagreement I basically agree
7 with SC&A's comments.

8 But I retain that objection from
9 Finding 6 and Finding 2 that they, that NIOSH
10 intends to develop another new model. Well, you
11 know, that was exactly what Dave Allen proposed in
12 October of 2010 when he wrote the path forward for
13 GSI.

14 He said at that time I'm going to
15 rewrite all the methods, all ten methods of dose
16 reconstruction for GSI. And it took several years
17 to accomplish that and all those, so that was done.

18 And here we are it took seven years to
19 produce Appendix BB, Rev 1 and there are still areas
20 of disagreement in it. That's obvious and that's
21 what we're talking about today.

22 So I do have a couple of questions for

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1 Dave Allen, in particular, that I need answered
2 this morning and I think they are directly related
3 to Appendix BB. I want to know from him or from
4 Dr. Neton, either one.

5 Dr. Neton said he can't answer this.
6 But I want to know when Appendix BB, Rev 2 is going
7 to be written. In other words when are these
8 changes that everybody agrees have been agreed to,
9 when will they be incorporated into a new revision
10 of Appendix BB?

11 I am very worried that this could take
12 weeks or months or even years. And the second
13 question to Dave Allen that I wish he would address
14 is one of the gentlemen on the line today has just
15 had a dose, a second reconstruction done under Rev
16 1.

17 And his Probability of Causation
18 increased from his first dose reconstruction in
19 2006 from 34 percent to 69 percent. So what I would
20 like to know from Dave Allen is what factors are
21 there in Appendix BB, Rev 1 that would lead to such
22 a dramatic increase in the Probability of Causation

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1 and comment on the fact of whether this will be a
2 likely change to all those other denied dose
3 reconstructions.

4 So can Dave please answer those two
5 questions? Again, when will NIOSH Rev 2 be issued?
6 And number two, what would account for a dose
7 reconstruction done under Rev 0 and another one
8 done for a second cancer of the same type under Rev
9 1 and the increase in PoC from 34 percent to 69
10 percent.

11 CHAIRMAN ZIEMER: Well, Dave or Jim,
12 either one want to respond on that?

13 DR. NETON: Well, this is Jim. I don't
14 think Dave is in any better position than I am to
15 forecast when the Appendix BB, Revision 2 is going
16 to be released. Much of it depends on the outcome
17 of this discussion today.

18 So I don't know how we could possibly
19 put a time frame on it. While I will say years is
20 not in the picture. But other than that I can't
21 comment on how long it would take.

22 DR. MCKEEL: Well I don't understand

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1 then when you all say that these changes will be
2 incorporated I mean then what that means
3 practically speaking is there will be no issuance
4 of PER-057 and there will be nobody who can get
5 their dose reconstructed using Appendix BB, Rev 1.
6 Is that what you're saying?

7 DR. NETON: If we're going to change it
8 we would more than likely hold up on any future dose
9 reconstructions under Rev 1, that's correct.

10 DR. MCKEEL: Even given the fact that
11 there have been at least two dose reconstructions
12 that I know about and have seen the dose
13 reconstruction reports and OCAS-001 and so forth
14 that there are two dose reconstructions that have
15 been done under Rev 1 already. Did Stuart give the
16 same answer?

17 DR. NETON: Yes, the idea is to get this
18 done as soon as we can. And as soon as we can finish
19 up with agreeing to these, there's only three
20 outstanding findings here.

21 Now maybe, I don't think there's huge
22 issues. But we need to address them and then the

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1 other ones that we've committed to fixing we can
2 fix pretty quickly.

3 DR. MCKEEL: All right. Well then
4 that would be my question. Assuming that let's say
5 they can all get resolved today and there is
6 complete agreement on all of those things in that
7 case how long would it take approximately, ball
8 park?

9 DR. NETON: That's something maybe
10 Dave is in a better position to answer than I am.

11 DR. MCKEEL: Well that would be good.

12 DR. NETON: Dave, can you comment on
13 that?

14 MR. ALLEN: Yes, we can get it drafted,
15 depending on what the resolution of these things
16 are we can get a new revision drafted relatively
17 quickly like a week or two. Our normal review
18 cycle includes Department of Labor and other
19 organizations and it, I think the time frame on that
20 tends to be about two months for the review cycle.

21 That's a limitation they're given.
22 Sometimes they will give us comments or say no

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1 comments earlier than that. But it could take up
2 to that and then time for incorporating comments
3 and then final approvals before the appendix gets
4 signed off.

5 It can be, I believe it's about a three
6 month cycle if the maximum times for all the
7 different steps are accounted for.

8 DR. NETON: But I would think in this
9 situation we would do everything we can to expedite
10 that time. I think that's the longest time period.
11 But we can do better.

12 DR. MCKEEL: Okay, can Dave then
13 explain to me please how you would, how he would
14 account for a rise in the PoC between 2006 and 2014
15 for the same type of cancer from 34 to 69 percent?

16 MR. ALLEN: Well I think that is all in
17 the appendix. If you look at Appendix BB, Version
18 0 versus Revision 1, you'll see some significant
19 differences in --

20 DR. MCKEEL: What are they? I'm
21 asking you to identify those, those weren't
22 identified, as I said, in your paper at all. There

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1 are no tables comparing the previous doses with the
2 new doses. So I'm asking you please identify for
3 me what doses have increased that dramatically.

4 MR. ALLEN: There were a number of
5 doses. You're well aware of what all those are.
6 They are spelled out in both revisions of the
7 appendix and I have no intention of going through
8 each and every difference that there was between
9 Rev 0 and Rev 1 at this point.

10 DR. MCKEEL: Well then what I'm trying
11 to ask you is Rev 1 was produced as a finished paper.
12 Is that not correct? You all have told me for
13 months, including Dr. Neton several times, that the
14 issuance of a new rev was dependent on the issuance
15 of Rev 1.

16 That occurred last June. Is that not
17 true? So I don't understand why that cannot be
18 acted on. And then if you come up with another Rev
19 2 or a Rev 3 then if necessary those things can be
20 done again.

21 MR. ALLEN: They can and I think Jim
22 misspoke one small thing when he was mentioning

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1 that earlier is when get a new case in from
2 Department of Labor or a return from Department of
3 Labor we do a dose reconstruction based on the
4 current revision of the methodology which in this
5 case is Revision 1.

6 So any cases we get in even today are
7 going to be done by Revision 1. There's another
8 revision, such as Revision 2 then once that's
9 approved you'll start using Revision 2 for all the
10 current cases.

11 Once we get a new revision such as
12 Revision 1 our normal approach is to go back and
13 look at cases that are already completed,
14 previously completed and see what the affect would
15 be on those. That takes a decent amount of work
16 and we usually don't do that if we think there's
17 yet another revision coming in the near future.

18 DR. MCKEEL: Do you consider four to
19 five months near future?

20 MR. ALLEN: I have no idea what the time
21 frame is going to be because I don't know what the
22 resolution, et cetera is going to be on some of

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1 these issues that have come up. So at this point
2 we're certainly waiting for this meeting and what
3 the outcome of this meeting is before we even
4 consider going through all that work knowing we're
5 going to have to go through it yet again.

6 It's basically a resource type of
7 decision that we can't keep recalculating doses for
8 all cases over and over and over if there's going
9 to be --

10 DR. MCKEEL: We all have said that for
11 the last seven years that it's taken to do Rev 1.
12 For instance, when I gave you the NRC license
13 documents for GSI that showed there were two radium
14 sources what the act says is that you all issued
15 PERs at the time that new information becomes
16 available and --

17 MR. ALLEN: And that's true.

18 DR. MCKEEL: The radium-226 sources
19 are major increases in doses, they were available,
20 that's a 2010 FOIA request. So it's been four
21 years since then. That's not issued, no PER has
22 been issued in a timely manner based on that new

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1 information.

2 Forget about the fact that the average
3 work week was changed and agreed to by everyone to
4 65 hours back in October of 2007 at the satellite
5 meeting that SC&A held. That's another thing that
6 should make some difference in dose changing from
7 46 to 65 hours. Anyhow --

8 CHAIRMAN ZIEMER: And, Dan, in fact
9 that's an example, that's an old one of course, but
10 we knew it was going to impact a lot of people, a
11 lot of workers but and there are other factors. I
12 think probably the question has been answered as
13 well as they can at the moment.

14 DR. MCKEEL: That's fine.

15 CHAIRMAN ZIEMER: And, you know, from
16 the Work Group's view we would like to come to
17 closure of that too. But while -- you know being
18 careful on closing these that really appears to be
19 the final two items here, 2, 5 and 6.

20 DR. MCKEEL: Well I just have two final
21 comments then.

22 CHAIRMAN ZIEMER: Sure.

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1 DR. MCKEEL: And that is I want to make
2 a comment about what I think you all will consider
3 to be SEC issues but I want to try to tell you why
4 I think they are also dose reconstruction issues.
5 And that is John Ramspott recently provided me with
6 a document called ORO Oak Ridge Office NCIS-53.

7 It's a 1972 document that is a
8 bibliography of 303 accidental over exposures due
9 to nondestructive testing or that sort of thing.
10 And on Page 23 there are two particular abstracts
11 that relate to GSI, Abstract 6008 and 61438.

12 What's interesting about those two are
13 there a list of AEC noncompliance division
14 citations that apparently actually extend back to
15 one of the charges dates back to the operational
16 period of GSI. And they are, I think they are so
17 important because there has been a narrative that
18 this Work Group has helped establish that the 1963
19 to 1966 operational period years at GSI were ones
20 with really an excellent, robust radiation safety
21 and film badge program.

22 And really that was taken off the SEC

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1 table early on. Well I want to quickly read to you
2 what the AEC found on inspection. They received
3 a complaint actually from a GSI photographer who
4 was also the union man.

5 And his question was prompted because
6 he was concerned about the new 80 curie cobalt-60
7 source that the men were not being trained how to
8 use it properly. So I want to stress this is during
9 the residual period now, 1970 and here's what the
10 AEC found.

11 Source storage rooms were not properly
12 posted. Copy of the license not posted. The
13 source was stored in an unrestricted area.
14 Utilization logs were incomplete. Radiographic
15 operations were conducted without a calibrated
16 survey instrument.

17 Survey records were not always
18 maintained and results of annual tests of
19 radiographers were not always available. So my
20 take would be if GSI management felt that those
21 charges were wrong, incorrect, not applicable they
22 would have rebutted them.

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1 Instead here's what they actually
2 offered in their response that's in Abstract 61438,
3 this paper I mentioned. New radiation signs were
4 obtained. A copy of the license was posted.
5 Sources are stored in a restricted room.

6 It doesn't say that they were stored in
7 a restricted room. It implies that they weren't
8 and so they're agreeing with the finding. New
9 utilization logs were prepared. What in the world
10 could that mean? You know, a utilization log is
11 something you make at the time of utilization. You
12 can't rewrite it after the fact.

13 New survey meters were purchased and
14 calibrated. That strongly implies that there
15 weren't survey meters to be calibrated. But the
16 most, it also says that records are kept to ensure
17 the sources are shielded before being stored.

18 Well if you read the 1962-forward
19 license documents of course SC, I mean, GSI
20 management has claimed all along with their
21 radiation safety people that has been going on all
22 the time and apparently it wasn't. Then number

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1 seven, this is the answer they couldn't find the
2 annual test.

3 Radiographers will be, will be tested
4 annually and tests filed. That was in 1971. So
5 to me what they're admitting if you put that data
6 together with the FOIA 2010-0012 which has at least
7 ten letters that have to do with GSI noncompliance
8 in the 1963 era, if you put that all together I think
9 it's mythology that there was a robust radiation
10 safety program.

11 So I'll just let that go. The second
12 thing I want to put on the record this morning is
13 that there is new testimony from a betatron
14 supervisor who is not on the line this morning.
15 But John Ramspott has collected the new affidavit
16 testimony from him and perhaps will speak to us
17 about that.

18 But he confirms that there were many
19 short betatron shots that were marked by the layout
20 bin on the railroad cars and on railroad tracks
21 outside of 10 building. SC&A in particular has
22 long contended and NIOSH has gone along with this,

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1 that was never done, that the layer was all done
2 off of the railroad tracks near the railroad tracks
3 in ten building.

4 So but this new testimony by this
5 gentleman says that frequently they would take the,
6 if they were working on a casting that had to be
7 fixed and then sent back in to be re- X-rayed with
8 the betatron, they would simply roll the transfer
9 car out onto the tracks beyond the, just beyond the
10 ribbon door.

11 Fix it and do the new layer and then send
12 it back in to be re- X-rayed and that this could
13 be repeated several times. So we, it's just, if
14 John has not already done so we will send you that
15 new affidavit.

16 I wish, for the record, you all would
17 please consider that as a Work Group and just know
18 that evidence exists. And I thank you very, very
19 much for letting me speak this morning and I hope
20 you will allow, I think several of the people on
21 the line from GSI would like to say a word to the
22 workers and I certainly would appreciate it if you

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1 would allow them to do so.

2 CHAIRMAN ZIEMER: Okay. Thanks, Dan.
3 And I believe we did get this morning the material
4 from John Ramspott, at least I got something with,
5 looking for it online.

6 DR. MCKEEL: Right. I had no chance to
7 look through all of that. So thank you.

8 CHAIRMAN ZIEMER: Yes, I should
9 mention that John we'll give you an opportunity a
10 little later to speak to that.

11 MR. RAMSPOTT: Mr. Ziemer?

12 CHAIRMAN ZIEMER: Yes.

13 MR. RAMSPOTT: Could I just mention one
14 thing, not on that topic? But I would like to
15 address that later. But sort of Dan's
16 conversation just now.

17 CHAIRMAN ZIEMER: Yes.

18 MR. RAMSPOTT: I thought I heard him
19 say that as new information is available new
20 reconstructions can be done or a PER. And I
21 thought I heard Dave Allen start to say and, Dave,
22 please correct me if I'm wrong.

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1 Maybe I heard you wrong. I'm on a
2 speaker phone. He didn't think that was the case.
3 What I would like to do is put into the record from
4 a published document what NIOSH does say.

5 NIOSH is committed to applying the best
6 available science to dose reconstructions.
7 Keeping with this commitment completed cases with
8 Probability of Causation of less than 50 percent
9 are reviewed as relevant, new information becomes
10 available.

11 The results of these reviews are
12 described in a PER report, PER. The PER details
13 the effect, if any, of the new information on the
14 completed dose reconstruction.

15 If it appears that the new information
16 may result in an increase in dose for a completed
17 dose reconstruction the Probability of Causation
18 less than 50 percent NIOSH is committed to working
19 with the Department of Labor to reopen and rework
20 the dose reconstruction as appropriate.

21 A program evaluation plan, PER
22 describes plans for evaluating specific program

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1 details or issues. Now it's quote, unquote. It
2 doesn't say we're going to do this in a year or two
3 years or five years or seven years.

4 It says if it's discovered. Well
5 Appendix BB, Rev 1, if that is not definition as
6 blatant, I guess example of new information I don't
7 know what the heck is. It's pretty evident.

8 You know, we have people that are
9 getting dose reconstruction done might have been
10 given, they jump from 34 to 69 I would say that's
11 a pretty good, evident proof that there's new
12 information to increase it. I think Dave just said
13 that.

14 You know, look at 0, BB Rev 1, there are
15 so many things they don't even want to put them in
16 a list. You know, it's, what's it going to take
17 to get this PER done? I mean, it should be done
18 today or should have been done yesterday and if you
19 find something new after another six months of, you
20 know, discussions then you do a PER renovation.

21 We have people, there are guys waiting
22 on this PER. I don't how they can sleep at night

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1 thinking about that or delaying it any further. I
2 can't, it bothers me. So that's all I wanted to
3 say on this topic.

4 But please comment or if someone on the
5 Work Group has a comment or Dave. You know, if you
6 think Dr. McKeel was wrong and I'm wrong on this
7 please tell me. Maybe I misread it, but I don't
8 think so. Thank you very much and I appreciate
9 your time.

10 CHAIRMAN ZIEMER: Okay. Thanks,
11 John. Yes, you read the correct definition of PER
12 of course. And I think that most, Dr. Neton and
13 Mr. Allen have addressed the limitations in terms
14 of resources.

15 I'm given information continuously.
16 There was, we were able to finish this out. And
17 that's, you know, not a lot more can be said at this
18 point. I think we hear you and we understand the
19 concern.

20 I'm going to move on here to NIOSH
21 responses. And that includes two papers. And
22 also, Dr. Neton, you may also want to respond to

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1 the comments relating to the use of Landauer
2 badges.

3 DR. NETON: Yeah, Dr. Ziemer, maybe I
4 could do that before we get into a detailed
5 discussion of the other issues.

6 The Landauer control badge issue had
7 been raised by SC&A from the first time that we
8 proposed to use them to provide bounding doses. And
9 in fact the original proposal to use that was
10 contained in David Allen's White Paper of January
11 2012, where he proposed that, since the control
12 badges, which sit on a badge rack presumably for
13 168 hours a week, never showed anything higher than
14 10 millirem, or milliroentgen, in a weekly cycle,
15 that those could be used to define the maximum
16 exposure a worker could have had, at least in the
17 area where the control badge was kept.

18 SC&A, ever since that report was
19 released, had commented multiple times that the
20 control badges actually were subtracted from
21 themselves, based on some comments they had
22 received or information they received from a former

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1 Landauer employee who is now on the staff of SC&A.

2 It didn't seem correct to us, but we
3 felt, eventually, there were three reasons the
4 control badges might not be useful. One was they
5 were purported to be subtracted from themselves.
6 The second issue was that the doses that we
7 reconstructed at those points using MCNP may or may
8 not be accurate because we don't know exactly where
9 the control badges were held. And also there might
10 be intervening material, the furniture, whatever
11 that might affect the readings that they received.

12 So, eventually when we got to the point
13 where the third issue became important, which is
14 they are subtracted from themselves, that came up
15 in an October -- I think it's an October Work Group
16 meeting. Yeah, the October 11th teleconference
17 meeting where we finally decided that we would get
18 additional information to verify that it, in fact,
19 is true, what SC&A had discovered with interviewing
20 one of their current employees.

21 And that did result in the discussion
22 between Stu Hinnefeld and Craig Yoder, who

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1 confirmed that in fact they were subtracted from
2 themselves. And that prompted me to issue the
3 November 5th e-mail to the Work Group talking about
4 the use of control badges.

5 And the subject, the first sentence of
6 the subject, said NIOSH raised an issue concerning
7 the correct interpretation of Landauer control
8 film badge readings. The entire memo is related
9 to film badge readings.

10 I didn't repeat the use of control film
11 badge readings at the end. Maybe I should have to
12 make it clearer. But the idea was that we would
13 not use the control badges to bound exposures, as
14 defined in Dave Allen's January 2012.

15 The approach is outlined in that
16 document on Page 23 and 25. It clearly spells out
17 that we're going to use control badges to bound the
18 workers' exposures, and the fact that doses as a
19 result of doing that are included in that White
20 Paper.

21 So it really has always been about the
22 control badges not being useful, not the individual

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1 worker badges. So the fact that, you know, the
2 worker badges from the residual radiation on the
3 betatron are used by SC&A, that was proposed by them
4 all along, even shortly in their response to the
5 January 2012 White Paper, in March 2012, SC&A
6 prepared a response which proposed using the badges
7 to bound the residual radiation exposure from the
8 betatrons.

9 And they also proposed to bound the
10 exposures to the so-called layout man using modeled
11 values based on MCNP runs that they had done. And
12 we have agreed to adopt both of those approaches
13 in Appendix BB, and that's where it sits.

14 So, in my opinion, there is no
15 inconsistency other than maybe some poor choice of
16 wording on my part in the memo that was issued in
17 November. So I probably said more than I need to,
18 but I guess that's all I have to say on it.

19 DR. MCKEEL: Dr. Ziemer?

20 CHAIRMAN ZIEMER: Yes.

21 DR. MCKEEL: May I please follow up
22 with that? Because I don't understand; there were

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1 a couple other parts to my question. And that was,
2 what does the last sentence, "NIOSH proposes to
3 adopt a limiting value for exposure to betatron
4 operators proposed by SC&A which does not rely on
5 the use of film badge data." What does ``

6 DR. NETON: That should not have said
7 betatron operations, people in the betatron area.
8 Because really we ended up using the dose for the
9 layout man as the bounding dose, not for the
10 betatron operator. If you look in Appendix BB, the
11 bounding dose to the layout man is 9 roentgen per
12 year between 1963 and '65 and prorated down to
13 roentgen per year in '66, which was a partial year.

14 All of those doses are based on Monte
15 Carlo estimates of the scattered beam to the layout
16 man. And all workers will receive that 9 roentgen.
17 Not one of them are based -- the whole body dose,
18 not one of them is based on a film badge reading.

19 DR. MCKEEL: And does that table in
20 Appendix BB state what you just said? And I'm
21 talking about Rev 1 now. Is that clear from Rev
22 1?

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1 DR. NETON: Is it clear where the 9 rem
2 comes from, 9 roentgen per year?

3 DR. MCKEEL: Yes.

4 DR. NETON: Dave could answer that
5 better. I'm sure we described the basis for that
6 9 roentgen per year.

7 DR. MCKEEL: That was that -- you're
8 assigning the layout man's dose to the betatron
9 operators?

10 DR. NETON: Correct. That's Table 8
11 in Appendix BB, Revision 1, specifically says the
12 source of the estimate -- Operator Dose Estimate
13 for Organs Other Than Skin is the title of the
14 table, Table 8, and in 1963 it says "source of
15 estimate, layout man, 9.002 roentgen per year."

16 DR. MCKEEL: And does it say that SC&A
17 developed that number?

18 DR. NETON: It does not.

19 DR. MCKEEL: That's not fair, is it? I
20 mean, isn't it NIOSH's job to develop all of the
21 --

22 DR. NETON: Dr. McKeel, that's a

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1 different issue unrelated to the use of film
2 badges. I would like to stay on this issue itself.
3 And we did not use film badges to bound the whole
4 body gamma radiation exposure to workers at GSI.

5 DR. MCKEEL: Did you use any film?
6 Well, let me ask you this, the global question.
7 Did you use film badge data to bound any doses?

8 DR. NETON: The film badge data that
9 was used, it was used, at this point which is under
10 discussion, to bound the exposure to workers from
11 the residual radiation that persisted for a few
12 minutes after the betatron was shut off and the
13 workers went into the room. That is true.

14 But that does not rely on a control
15 badge bounding scenario, which we originally
16 proposed in Dave Allen's January 2012 paper.

17 DR. MCKEEL: Mm-hmm.

18 DR. NETON: You can look at it, on Page
19 23, where he proposed to use those values in the
20 control room. There was some discussion about the
21 badges weren't in the control room, they were in
22 the hallway. And so that made the use of that

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1 badge, the control film badge reading,
2 inappropriate.

3 DR. MCKEEL: Mm-hmm. I agree with
4 that.

5 DR. NETON: Okay.

6 DR. MCKEEL: But I also agree that not
7 all the people that went in the betatron shooting
8 room wore badges. That's another assumption that
9 is just ---

10 DR. NETON: Well, that's another
11 issue, Dr. McKeel. And I'd like to stick to this
12 issue, which is what I meant to say when I issued
13 the memo and what ---

14 (Simultaneous speaking.)

15 DR. NETON: --- described that pretty
16 well.

17 DR. MCKEEL: Would you agree with me that
18 that memo is incomplete and inaccurate as it
19 stands? Wouldn't it be ---

20 DR. NETON: I don't think it's
21 inaccurate, I think the subject of the whole memo,
22 in context, was control film badge measurements.

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1 DR. MCKEEL: Okay. Well, I would say,
2 as a senior scientist from another field who has
3 extensive experience in this field, that it is not
4 clear and it would certainly be an improvement to
5 reissue that memo, clarify those points. And I
6 wish the Work Group would, for once, back me up and
7 ask you to please do that.

8 DR. NETON: I believe the record is
9 complete with the transcripts. It's very
10 well-reflected in the discussion of the
11 transcripts.

12 DR. MCKEEL: Okay.

13 DR. NETON: In the October Work Group,
14 there are pages of discussion on this that are
15 already in the public record, Dr. McKeel.

16 DR. MCKEEL: All right. I disagree with
17 you. Thank you very much.

18 CHAIRMAN ZIEMER: Yeah. Yeah, I
19 understood it the way Jim has described it. I
20 don't know if the other Work Group Members have
21 concerns about that. But that was my
22 understanding, certainly.

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1 DR. MCKEEL: Well, I mean no
2 disrespect, but you always jump in and say that you
3 understand these things that NIOSH says and the
4 other Work Group Members rarely comment on it.

5 CHAIRMAN ZIEMER: Well, I'm just
6 telling -- you give your opinion, I give mine, and
7 the others are welcome to comment if they wish.

8 DR. MCKEEL: I think they should.

9 (Simultaneous speaking.)

10 MEMBER MUNN: This is Wanda. And I'll
11 be glad to comment. I understand the wording
12 that's been offered to us as being straightforward.
13 Yes, I understand that.

14 CHAIRMAN ZIEMER: Okay. Jim, why
15 don't you proceed with the other comments, now,
16 that you have on SC&A's issues.

17 DR. NETON: I think that Dave Allen
18 will be able to do a better job of it.

19 CHAIRMAN ZIEMER: Yeah. I meant Dave,
20 right.

21 MR. ALLEN: Okay. You want me just to
22 go down the list on the findings or -- let's see

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1 the best way to do this. I'll try to be brief here.
2 And just going down the list on Finding 1, as Bob
3 mentions, we agreed with what their suggestion is
4 and intend to revise that.

5 On Finding 2 is beta dose to the
6 betatron operator, which he has table ---

7 DR. MCKEEL: This is Dan McKeel. Dave
8 Allen is inaudible.

9 MR. ALLEN: Really? Can anybody else
10 hear me?

11 MEMBER BEACH: I can. This is Josie.

12 CHAIRMAN ZIEMER: I'm okay on it.
13 Maybe just get a little closer and louder.

14 MR. ALLEN: Okay. I can rearrange the
15 phone and put it just right in front of me instead
16 of just slightly to the side. Maybe that will
17 help. Is that an improvement at all?

18 DR. MCKEEL: It is at my end. Yes.
19 It's Dan McKeel. Thank you.

20 MR. ALLEN: Okay. I'm going to
21 continue on. Stop me if you can't hear me. In
22 SC&A's presentation today, it was Page 4. There

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1 was a table for Finding 2 that Bob put on the screen.
2 It looks like he has -- yeah, he has it back up there
3 now.

4 And he said he could not understand the
5 differences there. And I think I can explain those
6 differences quickly. It's actually two issues.

7 One is that the NIOSH numbers there are
8 the numbers that appear in Revision 1 and, as Bob
9 pointed out, do not include the one meter doses for
10 the steel. Whereas the SC&A numbers do include
11 that in this table here.

12 In the December 2013 White Paper from
13 SC&A, when we were looking into this stuff, there
14 were different numbers. And they're all lower
15 than what we put in there. That one-meter dose,
16 of course, increases the number slightly and that's
17 why you see some of that difference.

18 And the other difference is -- I believe
19 it was for the uranium dose -- in SC&A's numbers
20 they were assuming a 7.5-hour per shift exposure.
21 I think it was for the uranium. And an eight-hour
22 per shift exposure for the steel. And I could have

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1 that backwards.

2 And when we were finalizing numbers for
3 Revision 1, we said that, you know, pretty much like
4 an inconsistency so we decided to go with eight
5 hours for each. And that's why our numbers were
6 higher all around, slightly higher, than SC&A's
7 from the last time we went through this.

8 And now, since they've noticed that the
9 one meter doses were not included, now it looks like
10 sometimes it's higher, sometimes it's lower. But
11 once the Revision 1 numbers -- if the Revision 1
12 numbers were changed strictly to add the one-meter
13 dose rates, they would all be slightly higher than
14 the SC&A numbers that you see in their table today.

15 I believe that's the two differences.
16 That's the explanation. And we agreed, the
17 one-meter numbers should be added.

18 CHAIRMAN ZIEMER: So are you saying
19 that the seven and a half versus the eight hours
20 is the reason for the other differences?

21 MR. ALLEN: Yeah. There's two
22 differences there. One is the SC&A numbers you see

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1 today have the one meter added. And the NIOSH ones
2 do not. And we've already agreed that we need to
3 add that.

4 The other is that eight versus seven and
5 a half. And that's why you see sometimes we're
6 higher and sometimes we're lower. When both of
7 those things are corrected, you would see our
8 number's always higher. Just slightly, not big
9 numbers.

10 Anyway, I hope that explains the
11 difference there that Bob was talking about. I'll
12 just leave that for issue five and move on. There
13 is that issue of continuous exposure and stuff that
14 we propose revising that to account for that.

15 And that will be what the next issue is
16 -- no, it's not the next issue. If nobody has any
17 more questions there; if you do, please speak up.
18 But ---

19 CHAIRMAN ZIEMER: Yeah, go ahead.

20 MR. ALLEN: Moving on, as Bob
21 mentioned, Finding 3 was that no dedicated
22 radiography facility in Building 6 until 1955.

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1 And I think he pointed out that we agreed and we
2 would change that. And I think we had just a tiny
3 bit higher dose on that one. If that's the right
4 one. And SC&A's verbally concurred with that,
5 what we intend to do there.

6 Finding 4, again, as Bob pointed out,
7 is just a simple error where we reduced the maximum
8 on that triangular distribution one year later than
9 we should have. The 1961 dose maximum should have
10 been 12 rather than 15 like we did. And we don't
11 disagree with that. We'll fix that one in Rev 2.

12 Then we're getting into Finding 5. And
13 Finding 5 is one that requires some discussion.
14 And that is the one that Bob said the radiography
15 was only 30 percent of the time and the person could
16 have been in the betatron building the other 70
17 percent of the time.

18 And we do disagree on that one. The 30
19 percent was from a source utilization log, and that
20 is the exposure time for the shot. So this is what
21 we put in our White Paper reply.

22 That's only a portion of the time it

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1 takes to do those shots. You also have the time
2 to set up the shots and to mark the spot where you're
3 going to take a shot, to put the film in there.

4 Being out in the areas, you also have
5 to carry the source, the film, and all that out to
6 that area. You have to take the film back to a film
7 processor to get it processed. There's a number
8 of other steps that are not accounted for in what
9 Bob is suggesting to do here.

10 And our understanding all along was --
11 our method on the gamma dose, for the radium
12 radiography, was for working radium radiography
13 all shift. The 30 percent is just the amount of
14 time that the source is exposed.

15 And we also did an estimate on what a
16 betatron operator would get. And as we said many
17 times all along, the intent was to compare the two
18 and use the limiting one, which is what we did in
19 Revision 1.

20 Bob is trying to point out here that
21 some people did work both jobs, even in one shift,
22 and I don't disagree with that. But that 30

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1 percent, as he also pointed out, was a maximum.
2 It's very possible, and I believe it certainly
3 happened, that there were days where the radium
4 radiography didn't have as many shots to take. And
5 then they would work on that and then go to the
6 betatron and work at the betatron.

7 But the limiting dose would be assuming
8 that they worked on the radium all-day long, or they
9 worked on the betatron all-day long, and pick the
10 higher one.

11 There was a another response from SC&A
12 that said they didn't think it would take very long,
13 apparently, in between shots for the radium because
14 it's an isotropic source instead of a very focused
15 source and you don't have to align it up nearly as
16 well. And I think that part might be true.

17 However, the betatron had some operator
18 aides to help them aim that quicker. There was
19 always an assistant to help them aim that quicker.
20 There was a light on the betatron. There was a
21 string to set the distances correctly, which is
22 things they didn't have with the radium source.

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1 But the biggest difference is going to
2 be the travel time, probably. Because they had to
3 take the source all the way to the location for the
4 radium radiography. They had to take the film back
5 to a place to get it processed. Whereas, the dark
6 room is right there in the betatron room. Any
7 number of other things that have never really been
8 discussed. But the idea that the radiographer was
9 there only for the time that the source was exposed
10 and never any other time is just not very realistic
11 in our mind.

12 Do we want to discuss this more or do
13 we want to move on, Dr. Ziemer?

14 CHAIRMAN ZIEMER: It'd probably
15 helpful just to go ahead and discuss it. Maybe
16 SC&A could respond to what you suggested here. It
17 was my understanding that you would take the
18 limiting dose, whichever it was, radium versus the
19 betatron. In other words, it's 100 percent of one
20 or 100 percent of the other, right?

21 DR. ANIGSTEIN: Yeah, I would like to
22 respond to that. Bob Anigstein. First of all,

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1 they discuss the travel time. Well, we already
2 established a travel time. The time it took to
3 withdraw the source from the lead pig in which it
4 was contained.

5 We're talking now, but let's stick with
6 the later period, because this is the gentleman
7 that I spoke with was working there based on his
8 records. I think he started doing the radiography
9 in the middle of '57. But if he had 18 quarters
10 through '61, I assume that's continuous.

11 So during that period, radiography was
12 almost always in the radiography room, in that
13 brick structure. The radium was contained in the
14 lead pig right in that room. It took 12 to 15
15 seconds to withdraw.

16 The radium was sitting there attached
17 to the fish pole, just simply a long pole, a wooden
18 pole with a string on the end. And the string has
19 a hook on it, that's why you call it a fish pole.
20 And the hook was through, attached with the eyelet.
21 I'm not sure if it was a hook or if the string was
22 tied. It was attached to the eyelet on the end of

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1 the little brass plumb bob, it was mistaken for once
2 upon time.

3 And so he simply lifted it out. And it
4 would have had a drilled hole so there was very
5 little scattered radiation. Whatever there was,
6 was straight up and where the lid, a lead lid which
7 may or may not have always been in place.

8 But anyway, you pick it up, carry it
9 over, put it down and walk away, 12 to 15 seconds.
10 Not 15 minutes. That's the travel time.

11 As far as developing the film, he would
12 take the film with him. And while the shot was
13 going on, he would go and develop the film. So he
14 didn't wait until the film was developed so he could
15 do the next shot.

16 He would fill up the next shot, then
17 develop the film from the previous shot. And that
18 was the, you know, firsthand information that I
19 obtained.

20 And as far as the limiting dose, this
21 was done in two different ways. On the one hand,
22 this triangular distribution was based on the

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1 maximum, which was simply the AEC badge limits.

2 The AEC badge limits don't say whether
3 he spent 30 percent or 100 percent of his time with
4 the radium. These are the limits that no one
5 exceeded. Therefore, everyone agreed that this
6 could be the maximum.

7 SC&A were initially composed using this
8 as a fixed number and then NIOSH and the Work Group
9 agreed to this triangular distribution to which we
10 agreed also. Whether reasonable or not, was a
11 reasonable amount.

12 And so the maximum was the AEC limit.
13 The mode, the most probable dose in the middle of
14 the triangle, was taken to be the time he spent in
15 the radiography room. Now true, if he left the
16 radiography room to expose a film badge, he would
17 have gotten slightly less.

18 Let me cancel what I just said. I
19 misstated that. The most of that 9.69 was the
20 exposure he got while carrying that radium source
21 back and forth. A small component of 200
22 milligrams was while he waiting in the radiography

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1 room. So if you say he wasn't always there, it
2 might have decreased it by a very small amount, a
3 slight small percentage.

4 And then the bottom of the distribution
5 was based on outside of the radiography room.
6 There was one account that it was one and a half
7 times the two millirem exposure limit. Anyway,
8 that was taken at the minimum.

9 So this was not changed. This was not
10 based on 30 percent, I mean this was still based
11 on the 30 percent. So this would not change if he
12 also spent time in the betatron.

13 So it would be betatron operator's dose
14 that I proposed. I mean the beta dose. The beta
15 particle skin dose and the neutron dose was taken
16 from taking the full-time betatron operator's dose
17 and prorating it.

18 And this is a little more complicated
19 because the same worker could easily do all of the
20 uranium radiography. Because uranium radiography
21 was at most 15 percent, and usually less, of the
22 working hours you are given here.

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1 So he could easily have drawn the
2 assignment to do all the radiography of uranium.
3 So he would get the full amount of beta dose and
4 neutron dose. And neutron dose is only from
5 uranium. There's neutron dose from radiographic
6 steel. There may be a little bit in the control
7 room, I take that back. But it's primarily from
8 the uranium.

9 And then taking again, the beta skin
10 dose, it gets much more from handling uranium than
11 from handling irradiated steel, where he took the
12 full time, 100 percent of the uranium dose and then
13 the remainder spent on steel. You take the 70
14 percent, you subtract the uranium hours, and it
15 gives you the steel hours.

16 So I think that this is entirely
17 plausible. And it's based on a real case. Now he
18 said 50 to 60 percent. Seventy percent is a
19 bounding estimate.

20 There may be room here to make some kind
21 of a judgment, there's maybe another triangular
22 distribution to match the photon dose triangular

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1 distribution, where the maximum was 70 percent and
2 some mode and minimum. Maybe mode of 55 percent
3 because that's what the worker said, 50 to 60
4 percent. So that might be the mode.

5 So we can re-calibrate the beta dose and
6 the neutron dose. But I would not dismiss it
7 entirely. I would not say that either you have to
8 have 100 percent with the radium and spend the rest
9 of the his time on the lunch break? Or that he has
10 a 100 percent in the betatron. I think the
11 combined scenario is very plausible. And is more
12 claimant-favorable.

13 CHAIRMAN ZIEMER: Bob, let me make sure
14 I understand the SC&A proposal is such a worker
15 would get a 100 percent of the betatron value plus
16 some percent of the radium?

17 DR. ANIGSTEIN: No, the opposite. The
18 opposite. The radium value is based on this
19 triangular distribution ---

20 CHAIRMAN ZIEMER: Right.

21 DR. ANIGSTEIN: -- does not say how
22 many hours he worked.

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1 CHAIRMAN ZIEMER: Right.

2 DR. ANIGSTEIN: I mean based on the 30
3 percent, the only time the 30 percent comes in is
4 the lower two parts of that distribution. The
5 maximum, the AEC limit. The middle one is almost
6 entirely based on the time it takes him to handle
7 the radium sources, and we said ten exposures per
8 shift.

9 CHAIRMAN ZIEMER: So you're saying the
10 full amount that he would get from the triangular
11 distribution ---

12 DR. ANIGSTEIN: Exactly.

13 CHAIRMAN ZIEMER: -- plus some
14 fraction of the betatron ---

15 DR. ANIGSTEIN: The neutron and beta
16 skin dose from radiography using the betatron of
17 uranium and steel.

18 CHAIRMAN ZIEMER: And that would be
19 some percentage of the maximum ---

20 DR. ANIGSTEIN: I listed those in my
21 report of the review of Rev 1. I, first of all said
22 what our position was, on the full-time betatron

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1 operator's doses.

2 CHAIRMAN ZIEMER: Right.

3 DR. ANIGSTEIN: And then there was
4 another table, I believe Table 5, a reduced amount
5 to account for the time that he spent on radium.
6 And then again that could be ---

7 CHAIRMAN ZIEMER: And what table are we
8 looking at here, let's see.

9 DR. ANIGSTEIN: What I show in my
10 slide, are my slides still visible, I'm not sure
11 if I --- am I still showing or do I have to go back?

12 MR. KATZ: You're still showing.
13 They're still up.

14 DR. ANIGSTEIN: Pardon?

15 MR. KATZ: They're still up.

16 DR. ANIGSTEIN: I'm so sorry. Okay. So
17 these doses are already including, these are
18 already prorated for the time that he's not in the
19 betatron, but doing radium radiography. It's
20 adjusted for 70 percent of work hours devoted to
21 betatron radiography.

22 CHAIRMAN ZIEMER: Okay. Okay.

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1 Mm-hm.

2 DR. NETON: Bob, excuse me this is Jim.
3 Did you say those values are prorated?

4 DR. ANIGSTEIN: Yes. So these are a
5 little lower, but not, again, not strictly
6 linearly. But it's explained in the long report
7 that was issued in December, where we took 100
8 percent of the uranium dose and then added the steel
9 dose, whatever hours he had left over to do steel.

10 What we're saying, if he did only
11 uranium, he spent 30 percent of his shift on radium
12 and then whatever hours he had left over he spent
13 on radiographic steel.

14 DR. NETON: Right. I'm looking at
15 these numbers ---

16 DR. ANIGSTEIN: It's not 70 percent of
17 the other number. If you go back ---

18 DR. NETON: Yes. It's clearly not 70
19 percent, it's only a couple of rem less.

20 DR. ANIGSTEIN: Yes. I know.
21 Because most of the dose comes from uranium. So
22 if you compare, it's not on the screen. If you

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1 compare Table 3 and Table 5 in the December 10
2 report. And you'll see that, for instance, I
3 specifically give the dose from uranium and from
4 steel.

5 DR. NETON: Right.

6 DR. ANIGSTEIN: Okay. And you'll see
7 that the uranium doses are the same and the steel
8 doses are significantly less for the same years.
9 Except that since uranium predominates for skin
10 dose, you don't see such a dramatic change in the
11 total.

12 DR. NETON: Yes. I don't know. I'm
13 just wondering if you'd went down to 50 percent,
14 it wouldn't be more claimant-favorable just to use
15 the betatron operator doses as we ---

16 DR. ANIGSTEIN: No. I'm still saying,
17 use the triangular distribution for that era it has
18 already been agreed on and remains. That applies
19 to all workers except proven administrative
20 workers. That's already been voted on and
21 accepted. So we're not deviating from that.
22 We're just saying there should be some beta skin

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1 dose and neutron dose to account for the part-time
2 occupation, occupancy of the betatron room, the
3 betatron building.

4 CHAIRMAN ZIEMER: Okay. Well look,
5 let me ask this. Does NIOSH need to consider this
6 further? Let me ask if there's Work Group
7 questions on this.

8 MR. ALLEN: This is Dave Allen. I
9 don't think we need to consider it further, but I
10 would like to point out a couple of things here.
11 Number one, Bob seemed to be saying that the travel
12 time was the 15 seconds from the source shielding
13 to where the radiography was occurring. And
14 that's just not true.

15 DR. ANIGSTEIN: Excuse me. I beg your
16 pardon. This is what the worker told me, it was
17 specifically, I specifically asked him in an
18 interview and I'm not sure if it was the same
19 interview. I interviewed this person about three
20 times and I'm not sure. It was one interview,
21 Dave, on which you were listening. I don't
22 remember whether that question was answered at that

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1 time.

2 MR. ALLEN: I'm not debating the 15
3 seconds, Bob.

4 DR. ANIGSTEIN: Excuse me?

5 MR. ALLEN: I'm debating that's the
6 only amount of travel time there is associated with
7 ---

8 DR. ANIGSTEIN: Well wait a minute.
9 The source, the one in the, the shooting that was
10 done inside the radiography room, and that's the
11 only one that this worker could testify to because
12 he wasn't there prior to the radiography room, he
13 was not employed at GSI.

14 So during that time, he said that's how
15 long, the pig was right there. The big lead pig
16 was right there. He lifted it out, walked over to
17 the radium source, walked over to the casting and
18 put it down.

19 He had the film in place ahead of time,
20 because you wouldn't want to be moving the film
21 while the radium was being moved, you know, after
22 the radium was put in place. And then if it was

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1 longer then you would get a much higher exposure.
2 And I don't think that's plausible.

3 MR. ALLEN: Well I don't disagree with
4 it. But like you said, the film was in place. It
5 didn't magically appear. The people ---

6 DR. ANIGSTEIN: That's true.

7 (Simultaneous speaking.)

8 DR. ANIGSTEIN: That's true. There
9 was a little bit of time ---

10 MR. ALLEN: They had to mark the
11 location to know where to put it.

12 DR. ANIGSTEIN: I don't know.

13 MR. ALLEN: Plus your travel time to
14 the developer. You're saying that they did that
15 during the next shot.

16 DR. ANIGSTEIN: Sure --

17 (Simultaneous speaking.)

18 DR. ANIGSTEIN: Excuse me.

19 MR. KATZ: Excuse me. Excuse me a
20 second, please. First of all the court reporter
21 can't possibly deal with this kind of back and
22 forth. So please, will you let Dave fully explain

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1 what he has to say and then you can respond to those
2 points. But not interspersed like this because
3 it's impossible to transcribe a conversation that
4 goes this way, please.

5 DR. ANIGSTEIN: I'm sorry.

6 MR. ALLEN: My point was that Bob was
7 saying that the film was developed during the next
8 shot. And that '83 document that says the source
9 utilization ended up, saying approximately 30
10 percent of the shift the sources were being used,
11 also said most of the shots were one to two minutes
12 in duration.

13 Developing the shot, we've got a few
14 different numbers, but they all seem to be between
15 10 and 13 minutes to develop the film. So it could
16 not be done in between most shots. Maybe one of
17 those shots, one or two long shots. But the vast
18 majority, that didn't happen.

19 If you've got a decent amount of time
20 between shots and when you're talking about the
21 radiography room, you also have time to, you have
22 to remove those castings. They were actually

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1 X-raying, to put the next one in, in order to X-ray
2 them. There is time involved with that, that he
3 cannot be setting up shots or doing much of anything
4 else other than waiting for the casting to be
5 dropped on the floor.

6 But there's quite a bit more time other
7 than the 30 percent of the shift that the source
8 is actually exposed associated with the radium
9 radiography.

10 DR. ANIGSTEIN: Okay. The actual time
11 spent, okay, let's say it's 2.4 hours, which ends
12 up to be about 140 minutes and there were ten
13 exposures. So the average time was about 14, 15
14 minutes per exposure, some were short, some were
15 long.

16 I don't know whether he did more than
17 one film and then took them in batches to be
18 developed. But I noticed that everybody said,
19 even during the worker meetings of the later
20 radiographers, time was of the essence.
21 Everything was done in a big hurry.

22 And then he also, if you notice in my,

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1 I point it out now, which is again based on an
2 interview that I had reported earlier. They must
3 have recognized that. Because they had two and
4 three people, so that he had helpers. They would
5 start off with one person, and then during those
6 later years there were two or three workers sharing
7 the duties.

8 So one would be setting up the shot,
9 another one likely running back and forth with the
10 film.

11 As I said, these are bounding values.
12 I would have no, if we wanted to come down and say
13 that 70 percent is, that's the highest that it could
14 be. That is 70 percent, should be lower than 70
15 percent, you know, there is room there. There is
16 leeway there. But to say it's zero, I think it's
17 contradictory to the evidence that we have, the
18 information that we have.

19 MR. ALLEN: Well this is Dave again. I
20 think the evidence that we have, as Bob pointed out,
21 that 30 percent source utilization was essentially
22 a maximum according to the documents there.

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1 DR. ANIGSTEIN: Mm-hm.

2 MR. ALLEN: The evidence that we have,
3 is it's probably more like, you know, maybe 15
4 percent, I think is the number Bob used. And the
5 rest of the time they've been in the betatron
6 building.

7 But, I mean if you wanted to use a 15
8 percent source utilization, and then add in some
9 time for the betatron exposure that's fine. But
10 we were trying to go with a maximum, an all-day
11 thing which amounts to 30 percent of the shift the
12 source is actually exposed. And the whole shift,
13 he's working with this type of radiography.

14 CHAIRMAN ZIEMER: Are we still going to
15 be apart on this or do we need to continue that
16 further?

17 DR. ANIGSTEIN: Actually, I need to
18 take a quick comfort break right now.

19 CHAIRMAN ZIEMER: Okay. Let's see
20 where we are on things here. Does everybody need
21 a comfort break?

22 MR. ALLEN: Well NIOSH could use one

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1 too.

2 CHAIRMAN ZIEMER: Okay. Actually on
3 the East Coast, it's one o'clock. Do you want to
4 take a lunch period? I'll ask everybody.

5 MEMBER MUNN: That might be a wise move
6 for everyone.

7 MR. KATZ: Well we could either take a
8 lunch break or if people were prepared to have lunch
9 at their desks, we could just take a 15 minute
10 comfort break, people could get their lunches.
11 But I don't know if anyone else is prepared to do
12 that or they want to just continue. But why don't
13 we hear because it would be nice to use the time
14 if we can.

15 MEMBER BEACH: Fifteen minutes works
16 for me.

17 CHAIRMAN ZIEMER: That works for me
18 too. How about Dan, John, how are you?

19 MEMBER POSTON: I'm okay with that.

20 DR. MCKEEL: This is Dan McKeel, either
21 way is fine with me.

22 CHAIRMAN ZIEMER: John Poston?

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1 MEMBER POSTON: Yes, I'm okay with
2 that.

3 CHAIRMAN ZIEMER: Okay. I guess we'll
4 take a 15 minute break, till 1:15 p.m. then, 1:15
5 p.m. Eastern Time.

6 MEMBER MUNN: Very good. It is right
7 now 10:00 a.m.

8 CHAIRMAN ZIEMER: 10:00 a.m.

9 MEMBER MUNN: Yes.

10 CHAIRMAN ZIEMER: Okay, quarter after,
11 thank you.

12 MEMBER MUNN: Thanks, Bye-bye.

13 (Whereupon, the above-entitled matter
14 went off the record at 1:00 p.m. and went back on
15 the record at 1:19 p.m.)

16 MR. KATZ: We are ready to start. So let
17 me just remind the folks on the line to mute your
18 phones please. Press * and then 6 to mute your
19 phone and then you can press * 6 to take your phone
20 back off mute when you have an opportunity to speak.
21 Thank you.

22 CHAIRMAN ZIEMER: Okay. We're still

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1 on issue 5 to see if, or I want to see how close
2 we are in terms of NIOSH and SC&A or whether we need
3 to just leave this item and go to the others.

4 Is there any point of -- the proposal right
5 now for, right now shows that they would do, for
6 giving dose reconstruction, they would do the
7 betatron and they would do the radium and whichever
8 was the highest, they would use. Is that correct?

9 MR. ALLEN: Yes, that's the way it's in
10 the appendix right now.

11 CHAIRMAN ZIEMER: Right. And SC&A is
12 proposing to use a fraction of the betatron dose
13 plus the radium dose. Is that correct?

14 DR. ANIGSTEIN: Yes, that is correct.

15 CHAIRMAN ZIEMER: Now ---

16 DR. ANIGSTEIN: The betatron dose,
17 again, is the beta skin dose and neutron dose.

18 CHAIRMAN ZIEMER: Right, not photon.

19 DR. ANIGSTEIN: Not to any, not
20 additional photon effects, right.

21 CHAIRMAN ZIEMER: And I'm trying to get
22 a feel for the differential on this. It, for the

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1 skin dose -- well, I never, obviously it would
2 depend on the cancer, but is there some percentage
3 of that that is amenable to NIOSH or you guys? It
4 feel likes your model is bounding as it is. I guess
5 you do lesser. That's your starting point anyway.

6 MR. ALLEN: Yes, that was for NIOSH
7 that you're asking?

8 MR. KATZ: Yes, Dave.

9 MR. ALLEN: Yes. This is, we're
10 basically still with the Rev 1 as far as the
11 technique there. We think the triangular
12 distribution was intended to be an all-day work
13 period for the radium operator.

14 CHAIRMAN ZIEMER: I'm getting a lot of
15 noise on the line. Clicking of some sort. It
16 started, now it's stopped. And now it's back. I
17 don't know what that is.

18 MR. KATZ: I'm not even hearing it,
19 Paul.

20 CHAIRMAN ZIEMER: Oh, okay. Maybe
21 it's local. Okay, Bob Anigstein, any thoughts?

22 DR. ANIGSTEIN: Well, no. I believe

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1 that the triangular distribution that has been
2 agreed to for the photon dose would be, we should
3 stick with that. I believe there should be some
4 beta skin dose and neutron dose assigned. It could
5 be less than the 70 percent occupancy as the
6 bounding will be. Personally, I would amenable to
7 something less than that. Perhaps another
8 triangular distribution where the 70 percent would
9 be the upper end and some small, some slightly
10 smaller amount.

11 But I still point out that this is --
12 I have two comments. First of all, I've heard, you
13 know, I respect what Dave said about some other time
14 being needed in between shots.

15 I also, my observation, and this
16 applies also to the next topic of the dose, the skin
17 dose from the irradiated steel, and that is, the
18 NIOSH position presupposes -- I'm trying to say
19 this in a diplomatic way but this is not intended
20 and I hope it doesn't sound like it's a reflection
21 on anyone's professional status or anything else,
22 but it seems to imply a state of knowledge that,

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1 to the best of my understanding, nobody really has.

2 It's trying to know, it's assuming we
3 know more than we know. How long it took in
4 between. How long, when was the film developed?
5 Does it, did they actually develop the film between
6 each shot? They could have developed several
7 films at once. Taken them out, waited until
8 several accumulated.

9 And the basic thing is, I'm just making
10 suppositions because my honest judgment is I don't
11 know and I don't think any of us know exactly what
12 happened there 60 years ago.

13 And consequently, I think that the
14 limiting scenario, the limiting but still
15 plausible scenario, gives the benefit of the doubt.
16 It's worker, it's claimant-favorable, which is
17 where we're supposed to be. When we're not sure,
18 we should err on the side of being
19 claimant-favorable of the higher doses. And these
20 are not unreasonable.

21 And they are based on the testimony of
22 the [identifying information redacted]. That he

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1 spent 50 to 60 percent of his time in the betatron
2 room and he's still got his film badge records. I
3 mean, that's a treasure trove of information. He
4 benefits only based on one individual.

5 And based on his records, he got the
6 high end of the triangular distribution on his film
7 badges. He got between 9 and 20 R per year, if you
8 take his, you know, his account of how much time
9 he spent and you prorate it to the full-time
10 radiographer he would have gotten 9 to 20 if he
11 worked full-time.

12 So, we can't discount that. And he
13 still says he spent 50 to 60 percent of his time
14 in the betatron. So, we can't discount that
15 information and say it's impossible to do radium
16 and betatron, you know. It would be full-time on
17 radium and full-time meaning 30 percent at 10 shots
18 per shift, and still do the betatron. It's just
19 not right to discount that information.

20 And whether it's 70 percent, 70 percent
21 is the limit. I would be amenable to it being less
22 than 70 percent. But if you say, if you give him

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1 the benefit of doing the uranium, we all along we
2 always said the same radiographer could do the
3 uranium because it's that many hours.

4 So if you give him the uranium, that's
5 most of it anyway. So reducing it from 70 percent
6 to 50 percent would just reduce the steel
7 component, which is not the major component.

8 And to do anything other than that just
9 strikes me as not being conservative, not being
10 claimant-favorable, in the light of the available
11 information.

12 If there were more information, maybe
13 it would have been less. But in the light of
14 available information, this seems to be the
15 reasonable, the plausible, and claimant-favorable
16 position.

17 CHAIRMAN ZIEMER: Well, I think, we
18 insert here now, and I don't think we want to be
19 in a position of trying to negotiate some value in
20 between. I think I'd like to get a feeling from
21 folks in the Work Group and from NIOSH if you
22 believe it is plausible.

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1 Because if it's plausible, then if the
2 scenario that Bob paints is truly plausible, then
3 in the interest of claimant favorability, we may
4 want to go with that. But NIOSH do you, how do you
5 guys feel about the plausibility of what Bob's
6 talking about?

7 MR. ALLEN: I think in reality -- this
8 is Dave again. I think in reality, that probably
9 happened, but I don't think it happened with the,
10 as Bob pointed out, the maximum of 30 percent source
11 utilization. I think we have maximized the radium
12 dose already with what we've done and then compared
13 it to somebody with 100 percent in the betatron and
14 picked the higher of it.

15 That prevents us from having to
16 arbitrarily pick a 50/50 number or something. We
17 just pick the maximum scenario. I think it's time
18 is accounted for with the radium doses the way we
19 have them now.

20 CHAIRMAN ZIEMER: So, in a sense,
21 you're saying that if you accounted for 100 percent
22 of the time with the radium, then that sort of means

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1 it's not plausible.

2 MR. ALLEN: Correct.

3 CHAIRMAN ZIEMER: Let me hear from
4 Board Members.

5 MEMBER MUNN: This is Wanda. I have a
6 tendency to agree with Dave. And due to the fact
7 that the concern here is covered in other ways, the
8 other aspect of that appears to be that the badge
9 reading or readings that we have are, in all
10 probability and common sense would tell you
11 they're, toward the high end of what most of the
12 other workers would have been receiving. So, it
13 appears to me that NIOSH's position is reasonable.

14 MEMBER BEACH: And this is Josie. I
15 believe that if there is any doubt between the two,
16 we should go with certainly the most
17 claimant-favorable, which in this case it sounds
18 like it might be SC&A's. So that would be my vote.

19 CHAIRMAN ZIEMER: Thanks, ladies.
20 And how about John?

21 MEMBER POSTON: Hello? Can you hear
22 me?

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1 MEMBER BEACH: Yes, we can.

2 CHAIRMAN ZIEMER: Yes, go ahead, John.

3 MEMBER POSTON: I turned myself on and
4 off there a couple times. I guess I'm stuck in
5 between, because they're both, both sides of the
6 issue have some merit. But I guess I'm leaning
7 toward the SC&A approach.

8 CHAIRMAN ZIEMER: The SC&A approach,
9 you think?

10 MEMBER POSTON: Yes.

11 CHAIRMAN ZIEMER: Okay. Well, what
12 I'd like to do here -- I'm leaning that way myself
13 if it's indeed plausible. I'd like to hear before,
14 because we want to try to close, we're going to come
15 to each of the findings. There's one of them I
16 think we can close out. We might be able to close
17 this out in one way or the other. I'd like hear
18 the position and relationship. Let's go ahead and
19 hear about issue 6 as well before we do any actions.

20 MEMBER POSTON: Paul, if I may
21 interrupt just a moment?

22 CHAIRMAN ZIEMER: Yes, please do.

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1 MEMBER POSTON: There's no right
2 answer here, you know. It's --

3 CHAIRMAN ZIEMER: Yes.

4 MEMBER POSTON: I like doing homework
5 and getting a grade based on the answer. There's
6 no correct answer here. We don't know what it is
7 and that's what the reconstruction is all about.
8 So we just have to do the best we can.

9 CHAIRMAN ZIEMER: Right. But I think
10 Bob was suggesting there's some related issues in
11 issue 6 philosophically. Did I understand you
12 right, Bob? Bob, are you there?

13 MEMBER BEACH: We may have lost him.

14 CHAIRMAN ZIEMER: Bob, if you're on the
15 line, you're on mute.

16 DR. ANIGSTEIN: Sorry, my mute button
17 was on. Right. Okay, let me re-visit what I said.
18 Philosophically, there is a connection.
19 Technically, there is no connection because the
20 doses we're talking about with the radium era is
21 1950 through 1962 and the doses in issue 6 is the
22 layout man skin dose, which is '63 through, '60

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1 through '66.

2 So they're technically, the facts are
3 completely separate. And the only reason I said
4 there was a connection, I'll get to that when it
5 gets to that point. Do you want me to go ahead with
6 my take on it or do you want Dave to talk about it
7 first?

8 CHAIRMAN ZIEMER: Dave can talk about
9 it and then you can. But I want him to hear that
10 discussion and, you know, finish this off and then
11 we'll go back and take action on the findings then.
12 So go ahead with 6. I think we've talked about 5
13 as much as we can at this point.

14 MR. ALLEN: Okay. This is Dave Allen.
15 You wanted me to go ahead and talk about 6 then?

16 CHAIRMAN ZIEMER: Yes, yes.

17 MR. ALLEN: Okay. Issue 6 is the one
18 we wrote a separate paper on. That is the beta dose
19 for the layout man.

20 Just a slight background, as everybody
21 I'm sure remembers, is we had quite a bit of
22 discussion about neutron doses, about beta doses,

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1 et cetera, during numerous Work Group meetings.
2 And we came to a resolution on a number of these.
3 And then NIOSH set about to write Revision 1 to the
4 Appendix.

5 When we started writing, we realized
6 that we did not actually discuss layout man beta
7 dose during Work Group meetings. We had discussed
8 the beta dose to the betatron operator and we had
9 discussed the gamma dose to the layout man, but we
10 never discussed the beta dose to him.

11 So trying to come up with some
12 resolution there, that itself is enough
13 information to come up with the beta dose. So
14 simply use the layout man scenario. The scenario
15 on, you know, castings moving in and out, et cetera,
16 that was developed for the gamma dose, and use the
17 beta calculational techniques that we agreed to
18 with the betatron operator. And I combined the two
19 to come up with what's in Appendix 1. I'm sorry,
20 Rev 1 of the Appendix.

21 Since that time, that was -- we agreed
22 to use those techniques for the beta with the

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1 betatron operator, knowing that there were some
2 very conservative numbers in that, but knowing also
3 that the uranium beta dose over-weighed what was
4 propelling from the steel. So it wasn't really
5 worth arguing in our opinion, so we'd just say okay
6 to it.

7 So then once the Revision 1 to the
8 Appendix was being written, realized that that
9 technique and those scenarios, it was a pretty high
10 beta dose for the layout man. But since all that
11 had been agreed to in the Work Group meetings, we
12 went ahead and put it together that way.

13 Then SC&A reviewed Revision 1, they
14 said, no, that's not the scenario that they agreed
15 to. They say there was a scenario in the 2008
16 original review that we agreed to, which, if we did,
17 that was a misunderstanding because I don't believe
18 we ever even talked about this in there, in the Work
19 Groups.

20 And so, in the White Paper I wrote up,
21 I said if we come to talk about, you know,
22 rearranging the whole beta dose to the layout man

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1 and we do want to address and so we'll bring it back
2 it up again, we do want to address the area
3 over-estimating assumptions that were in that beta
4 dose technique. Primarily that 30 continuous
5 hours of irradiation by the betatron every 75
6 minutes.

7 And long and short, we wrote up our
8 paper as to how we felt we should address this and
9 submitted it to the Work Group and now we're ready
10 to discuss that. I'm not sure what more you want
11 on that one, Paul.

12 CHAIRMAN ZIEMER: So, I think we can
13 hear from SC&A at this point.

14 DR. ANIGSTEIN: Okay. Well, first of
15 all, I think we have a slight divergence here. We
16 never changed the methodology of calculating the
17 beta skin dose to the layout man and we had done
18 it in the past.

19 We had reported it back in 2012, based
20 on some earlier MCNP runs using an earlier version,
21 a trial version, beta version. Not to be confused
22 with the, you know, alpha-beta version of, beta

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1 version of the code. Nothing to do with beta
2 radiation.

3 And so we had wanted -- it had been
4 reported earlier, then we came up with some new
5 numbers. We redid it. We redid that. We redid
6 the runs back in the fall of 2013. And basically
7 we used the same MCNP analysis for the betatron
8 operator and the layout man.

9 The only difference was the -- then once
10 you get the MCNP results, which is simply telling
11 you how many atoms you have always radioactive,
12 radioisotope, radionuclides you created per second
13 of exposure.

14 Then we go and say, okay, how long
15 before the worker is exposed to that radiation and
16 during what duration. So the betatron operator
17 and the layout man's analysis diverge. This is
18 done with Excel spreadsheets using the MCNP
19 results, the MCNP results.

20 Anyway, I'm getting a little too
21 technical here. But anyway, we did do one back
22 last, we just didn't bother putting that in and that

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1 was a neglect based on a little confusion on my part
2 as to, well, if you have a higher skin dose with
3 the betatron operator, you don't need to calculate
4 layout man's skin dose.

5 But I realize, as they pointed out, you
6 can't mix the two. You can't add the layout man's
7 gamma dose to the betatron operator's beta skin
8 dose, so that's why we did that layout man.

9 And of the -- we can summarize the NIOSH
10 response is that it's not a physically realistic
11 scenario and why didn't we use -- we had also done
12 the photon dose from the irradiated steel. And the
13 question came, why don't we use the same scenario.

14 Well, the photon dose was done way back
15 in 2008. We had a scenario then. And our aim, at
16 that point, was simply to respond to Appendix BB,
17 Rev 0.

18 And at that point, we simply pointed out
19 that there were overlooked pathways, exposure
20 pathways. There were overlooked scenarios.
21 There were overlooked analyses. And we just
22 wanted to -- we just ran our analyses at that time

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1 to show, look, when you do it a more complete, what
2 we felt was a more complete, approach, this is what
3 you get.

4 So these are examples of overlooked
5 exposure. That's the way we saw it at the time.
6 Not saying we've got the final answer. This is
7 what you should use. But this is, here's an
8 example.

9 Because if we simply said, this is my
10 approach, well, we don't think your approach was
11 adequate. You should have done such and such.
12 Then the answer always is begging the question, but
13 is it important?

14 We don't want to say something is
15 important. Then it turns out, yes, it's a half of
16 one percent difference, so why are we wasting time
17 on it.

18 So we did the actual analyses just to
19 show the F potential. And we didn't have actually
20 intend for that to be the limiting exposure.

21 And so, I did that the, my colleagues
22 and I, we did the exposure for the photon radiation

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1 from an irradiated steel. We saw that it, then
2 later when we refined the layout man's dose, we saw
3 this is a small fraction.

4 The layout man is already getting a
5 photon dose of 9 R per year, which is primed
6 directly from the betatron because he's sitting
7 past that thin door, which is essentially
8 transparent to high energy photons. And by
9 getting it from there, for the small additional
10 amount he gets from the steel, wasn't important
11 enough to say, okay, let's do these analyses over
12 again. Let's refine them. So we just let it go
13 at that. It was a small amount. It could have
14 been an increase.

15 But then when it came to the beta dose,
16 well, that was the entire, the majority of the skin
17 dose comes from that or a large fraction comes from
18 that. We took the more limiting approach.

19 And all that needs to do with the
20 technical operation of MCNP, where actually it gave
21 you the, what they call, delayed gammas. So it
22 actually gave you photon radiation as a function

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1 of time after exposure.

2 So we could do this very neat, saying,
3 okay, I was radiated hours ago. This much is left
4 from that, away from that exposure. This much was
5 left from this one. It didn't seem plausible at
6 that time how to do this with the betas.

7 So we just said, let's just assume that
8 it was, that the maximum exposure of the steel was
9 30 hours. And this was based on being told that,
10 well, it goes back five or ten times to be re-
11 X-rayed, re-examined, as a typical casting. So I
12 just said, pick the middle. Call it seven and a
13 half times.

14 And then, because of overlap a single
15 region of the casting could get as many as four
16 shots because you overlap the film to make sure that
17 you don't miss anything.

18 So we took that -- so we take four times
19 seven and a half and say, okay, for a portion of
20 that steel could have been irradiated for three
21 hours. And rather we did not put in the
22 interrupted. They said, okay, it gets irradiated

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1 for an hour, then there's a 15 minute pause and
2 maybe there's another shot or maybe a couple hours
3 later.

4 We just said, we'll do it simple, do it
5 bounding, say it's 30 hours and then we allow, at
6 the end of those 30 hours, there will be a decay.
7 There will be 15 minutes before it gets to the
8 layout man. And so for the, most of the nuclides
9 come to equilibrium.

10 Iron-53, which is the main contributor
11 to the beta dose, is something like eight and a half
12 minutes' half-life. So it comes and 80 minutes,
13 then half-life, it's in complete equilibrium so it
14 doesn't matter whether you do it for 30 hours or
15 30 years. It will be the same.

16 A few of the longer lived ones,
17 manganese-56, I think, molybdenum-99 -- they're
18 smaller contributors to the dose but they do build
19 up in time so it makes a difference.

20 So we just made this a limiting scenario
21 and then we also made a limiting scenario that there
22 was a new -- if you're assuming, just a long shot,

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1 there is a new casting or a new exposure every hour
2 and a quarter. So it's 15 minutes for the
3 exposure, 15 minutes for the transfer time.

4 So he's getting, again, every 75
5 minutes, he gets a new casting. This is bounding.
6 And the original scenario dealt with was the use
7 for the photon dose was, well, he spends the whole
8 day on one casting and has done all four shots.

9 And the problem with that is this was in a
10 story that was told to me by to me by a former,
11 deceased, member of his staff there. And the very
12 next day he took it back. Very next day he sends
13 me an email, and I appended these to my paper.

14 And, by the way, those emails were
15 transmitted in a single package to the NIOSH staff,
16 Dave and Jim, and to the Work Group that was then
17 with the Procedures. It was Wanda's Procedures
18 Work Group that was then handling it. So this is
19 not new information now. It's -- I can't blame
20 anyone for not remembering, seven years later, that
21 they got that information.

22 But I sent the unredacted, unexpurgated

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1 emails, copies of emails -- I took all the email,
2 put them into PDF files -- emails and memos attached
3 to emails from a number of the workers. And the
4 man was most knowledgeable --who was in charge of
5 this betatron operation. And several of the
6 betatron operators and I think one of the gentlemen
7 that's online now, if I remember correctly, but
8 actually signed -- his name appeared on one of those
9 memos, but it was a joint thing.

10 And they said, no, no -- this isn't
11 right. This kind of an occurrence where he works
12 from one casting without interruption, that's
13 rare. He was constantly being interrupted.
14 There were constant shots. And then even our
15 picture, which we adopted also -- and I was
16 re-examining these emails correspondence with the
17 workers -- there were either castings with either
18 long shots or short shots.

19 Actually, it was the same casting
20 because the casting would have ribs. So that thin
21 part was given a short shot. The thick part was
22 given a longer shot.

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1 So that's an over-simplified picture
2 and, therefore, this bounding scenario, again --
3 as I said, philosophically, it's connected. It's
4 related to the previous issue, that this is the
5 bounding scenario which is based on lack of
6 complete knowledge.

7 And the reality is even if everybody was
8 present who had done that and it happened yesterday
9 so they had exact recollection, they still wouldn't
10 be able to remember it because every time they --
11 every casting, every radiography campaign run was
12 different.

13 So there was no one, there was no single
14 thing that would be just, you know, time after time.
15 There were some differences. So, again, we can't
16 do, it's not feasible to do a dozen scenarios.
17 Even if we had the time and resources, we don't have
18 the knowledge.

19 So consequently, we think that this is
20 bounding and also, again, if we got absurd doses,
21 if everybody got the 100 rad a year then you would
22 say, well then everyone would have a cancer and that

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1 didn't happen.

2 But since the doses are, 1, you know,
3 1.9 to 1.1 depending on the hands and forearms and
4 the rest of the body compared to 9 power per year
5 of the direct exposure, these are not implausible
6 and not, you know, biologically impossible like,
7 you know, it would be -- you assign somebody a dose
8 of 1,000 rad, but he'd be dead.

9 There seems to be that these are
10 plausible and claimant-favorable, so then same as
11 the others. Mechanistically, no, we can't really
12 come up with a time and motion study saying you could
13 really have that many hours of exposure.

14 That was the ideal of the interrupted
15 exposure that NIOSH worked out in their paper.
16 That's a very well thought out analysis, so the AP,
17 the concept of being able to -- as I originally
18 thought the dose would be too complicated, okay.
19 So they had, they produced an algorithm which we
20 checked, it is correct. The mathematics is correct
21 in terms of the model that they proposed.

22 So that could have been reduced slightly

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1 if we had done the interrupted exposure rather than
2 a continuous exposure. I don't think it would have
3 made much of a difference because, as I said, most
4 of the radionuclides, those are the major -- the
5 major difference the eight hours of, with only 1,
6 with only 10 percent interruption for a more
7 recently irradiated casting.

8 That's the -- comes with a major
9 difference between our results and theirs. I don't
10 think the interrupted model would make a very large
11 difference. So -- and then also the other the other
12 thing that they -- that the NIOSH scenario overlooks
13 is that you had two betatrons operating
14 simultaneously.

15 However, the castings were repaired in
16 these, within the processing and finishing
17 building, I think they're called, Building 8, 9 and
18 10. And some of the castings were in Building 10,
19 which is right next to the new betatron.

20 So it's entirely plausible that the
21 castings from the old betatron, which is just 200
22 yards away, and its connected by a railway track,

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1 would have been shipped over to the same -- and the
2 same layout man could have been working on those
3 because you'll be then turning them over to the
4 repairmen in the same building.

5 So the fact that you could have had
6 castings from two betatrons instead of one in the
7 mix is not implausible. It could be on one or the
8 other. And I also want to throw in, -- speaking of
9 this, just to comment -- forget it. I don't want
10 to be -- it's a distraction.

11 So anyway, that's the -- that's
12 basically our story.

13 CHAIRMAN ZIEMER: Okay, thanks, Bob.
14 I'd like to ask Dave -- Dave, do you have further
15 comments? And I know that this last analysis, I
16 guess, has only arrived a few days ago. Have you
17 guys looked at that carefully? And, Dave, any
18 other comments relative to the original?

19 MR. ALLEN: Which? I'm sorry, Paul.
20 Which document are we talking about now?

21 CHAIRMAN ZIEMER: Well, SC&A's layout
22 men, the beta skin dose document -- just came out

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1 a few days ago -- their last comments on your
2 document.

3 DR. ANIGSTEIN: Last Friday it would
4 have --

5 (Simultaneous speaking.)

6 CHAIRMAN ZIEMER: All right now, it's
7 right at January --

8 MR. ALLEN: Was it -- oh, January 30th?

9 DR. ANIGSTEIN: Right.

10 MR. ALLEN: Yes, I got that. Sorry.
11 And what was the question now? As I read it, it was
12 essentially -- it's not much different than what Bob
13 just reiterated. I don't think --

14 CHAIRMAN ZIEMER: Right, that's what he
15 was talking -- yeah. I'm just asking if there were
16 any changes that SC&A's spoken from their previous
17 document because the numbers are a bit different,
18 of course, between the two positions.

19 And, again, this is one that the Work
20 Group may have to resolve, one or the other. But
21 I just wondered if SC&A or NIOSH had any additional
22 comments or are you standing with the previous

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1 values, which I guess are the ones in, on the right
2 side of Table 1, correct? Is that--

3 MR. ALLEN: You lost me one more time.
4 Table 1 of what document?

5 CHAIRMAN ZIEMER: Of the SC&A document.
6 That they show -- they show the NIOSH values for the
7 skin dose for the layout man.

8 MR. ALLEN: Yes, that's our position
9 right now is, I mean, it hasn't changed here. And,
10 like I said, Bob just reiterated pretty much what
11 he said in this document and --

12 DR. ANIGSTEIN: Is this showing up on
13 the screen, everybody's screen? This is from my
14 slideshow earlier today. Am I visible?

15 MR. KATZ: You are, yes.

16 DR. ANIGSTEIN: Okay, so this is our
17 position. This is the Appendix BB Rev 1. And this
18 is the January position paper or response paper.

19 CHAIRMAN ZIEMER: Yes.

20 DR. ANIGSTEIN: And there are
21 significant differences, particularly -- the
22 greatest difference is really between the NIOSH,

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1 between Appendix -- between Rev 1 and the most
2 recent.

3 MR. ALLEN: Yes, and that's accounting
4 for the intermittent exposure.

5 DR. ANIGSTEIN: And also I think a much
6 slower, longer duration. You know, they're
7 working on one casting most of the time.

8 MR. ALLEN: Well, that's probably the
9 800 that's there from the Rev 1. That was already
10 there.

11 DR. ANIGSTEIN: Oh, that was there?

12 MR. ALLEN: Yes.

13 DR. ANIGSTEIN: Yes, okay, I didn't
14 notice that.

15 MR. ALLEN: Yes, it dropped the counts
16 for the intermittent exposure as well as -- it's
17 actually a little higher than what you would get
18 just from that because we said we just assumed it
19 was shuffled back and forth until it reached
20 equilibrium.

21 DR. ANIGSTEIN: Mm-hmm.

22 CHAIRMAN ZIEMER: Okay, great.

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1 MR. ALLEN: I'd like to point out is
2 there was several parameters that we discussed, not
3 just the continuous versus intermittent exposure.
4 And Bob was discussing one of those being that
5 there's, I believe there's a hidden assumption,
6 that there's no continuous work on one single
7 casting it's all interrupted work and just
8 shuffling and getting out of the betatron.

9 But there's also, it's, believe it or
10 not, not that small, is the issue of the fraction
11 and the long or the short shots. The numbers that
12 have been used for all the other models for the
13 betatron operator for layout man and for the photon
14 and pretty much everything we've done so far is
15 based on 10 percent of the shots being the thicker
16 shots. And 90 percent of the shots being short
17 shots.

18 The 36 percent of the time and 64 percent
19 of the time you see in some of these documents are
20 the exposure time in the betatron. It's how long
21 you would be working on shots if you were doing 60
22 minutes per shot at 10 percent of them versus 90

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1 percent of them you're doing 3-minute shots, which
2 is not really -- in my opinion there, I can't see
3 where the length of that shot is relevant to
4 locating and fixing the defect.

5 It seems like once you get the X-ray,
6 however long it took to get the X-ray, you should
7 be able to mark the defect and grind it out and
8 repair it. It's going to take some amount of time
9 to do that but it's not going to vary depending on
10 how long it took you to do the X-ray shot.

11 That's why we're -- we were using the 10
12 percent and 90 percent shots that, I believe, one
13 of the operators gave Bob years ago. Essentially,
14 that's one of the parameter that is, it's not a small
15 deal.

16 I've got too many documents open on my
17 desktop here. I'm trying to get back to my original
18 thing were I had them -- here we go.

19 The interrupting casting thing, we
20 thought we had an agreement with the scenario based
21 on the photon dose. And, obviously, as Bob said,
22 and what he put in writing, they're disagreeing with

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1 that. The fraction of the short and long shot was
2 actually not in the original SC&A model or ours.
3 But Bob put it in this one and I don't disagree with
4 that. I think that's a good idea, but we disagree
5 on the fractions.

6 And, well, I think it's the two
7 parameters that enter into it. I really think if
8 we're going to discuss this, the thing I had the most
9 problem with is the 30 continuous hours of betatron
10 irradiation over these 75 minutes. And that's the
11 thing I labeled as the impossible scenario.

12 I know Bob has issues with the idea of
13 shuffling two castings back and forth as
14 unrealistic, and I don't disagree with that. But
15 I don't think the solution to unrealistic is to get
16 to something that's actually physically
17 impossible.

18 Anyway, I know I've scattered around
19 there. Does anybody have any questions on it?

20 DR. ANIGSTEIN: Well --

21 CHAIRMAN ZIEMER: Well, basically it
22 comes down to whether the assumptions are

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1 acceptable.

2 MR. ALLEN: Right.

3 CHAIRMAN ZIEMER: And is the driver on
4 this one mainly the difference between the 90/10
5 ratio and whether it was that 64/36 issue?

6 MR. ALLEN: I can't say one drove more
7 than another, to tell you the truth, Paul. They all
8 had not insignificant effects.

9 DR. ANIGSTEIN: I'd like to comment on
10 that.

11 CHAIRMAN ZIEMER: Go ahead.

12 DR. ANIGSTEIN: Okay, first of all, the
13 basic scenario was not 90 and 10. The basic
14 scenario was that he spends the full day on the short
15 shot casting, which then became -- and of course the
16 short-lived nuclides over that 8-hour period decay
17 to nothing.

18 And then the other is -- so that's
19 already been retracted by the site experts. So
20 they're basing it on, basically, a discredited
21 scenario. Again, we can be faulted for having used
22 it, but we're just using it as a -- we used it back

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1 in 2008 as a simple example, something that was --
2 that you could come up with some numbers even if they
3 were not the best numbers.

4 The second thing is I disagree that the
5 length of -- that the thickness of the casting had
6 nothing to do with the time the layout man spends.
7 Because the thick casting's going to have a lot more
8 defects. The layout man looks for defects. He
9 takes the film and he only marks where there's a
10 defect. And consequently I don't know what the
11 real ratio should be, but I don't think it's the
12 same.

13 In other words, I don't think it would
14 be the same amount of time, the same number of
15 defects, the same amount of time, with the thick
16 castings and the thin castings. And particularly
17 since, in most cases, many cases, it's the same
18 casting. It has the thick parts and thin parts.
19 So that whole detailed model is really based on not
20 terribly solid evidence.

21 So the one point I would agree is the 30
22 hours. Had I do it over again I would say, yeah,

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1 I would use the interrupted, you know, 60 minutes
2 on, 15 minutes off in between. But again, I
3 wouldn't know how to get, okay, how much time is in
4 between they'll be taken out of the betatron room.

5 The fact is -- I'm just going to retract
6 what I just said, that that I should have done it
7 otherwise. This is bounding. It's not
8 mechanistically -- it's not a mechanistic, it's a
9 conceptual model. And on the one hand, it can't get
10 any worse than that. And on the other hand the results,
11 the doses are not implausible. 1.9 rad per year
12 skin dose compared to a 9-hour per year dose from
13 the betatron itself does not seem to be such a
14 stretch that it's unreasonable.

15 And the other one is -- it's also
16 implausible because the radiography simply isn't
17 done that way. You don't take one casting and keep
18 reshooting the same casting, switching it back and
19 forth.

20 So I would rather err on the side of
21 conservatism and say here's something that can't be
22 -- it can't be any worse than that and yet it's a

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1 -- and this something, by the way, looking at other
2 sites that had, you know, that I've had occasion to
3 review in the past.

4 NIOSH has very has very frequently used
5 somebody stands next to a barrel full of uranium at
6 a one-foot distance for eight hours a day. It's a
7 limiting scenario. It's also not plausible that
8 that -- you know.

9 Now, many such cases, I'm just using
10 that as a precedent, where limiting bounding
11 numbers are used in the absence of a detailed time
12 and motion study and detailed accounts. So I don't
13 see that this is, you know, that that's such a
14 radical departure from that philosophy.

15 MR. ALLEN: I think I can respond to
16 that, Bob. There is a difference between
17 unrealistic or plausible versus possible. Your
18 scenario there with the 30 hours of irradiation
19 every 75 minutes is akin to, for your example,
20 standing next to a drum of uranium for 30 hours every
21 day.

22 It's just not physically possible with

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1 the laws of time and physics. You can't irradiate
2 a casting for 30 continuous hours every 75 minutes.

3 DR. ANIGSTEIN: And I agree with that,
4 but when you can't -- okay, I agree with that, but
5 I think that the NIOSH -- it's not possible and it's
6 not even plausible. It is bounding. It gives
7 results that are not -- they're not results that we
8 should not be able -- we should be able to live with.

9 Again, it's not like, you know, there
10 will be 100 percent skin cancer because it's such
11 a high dose.

12 MR. ALLEN: Bob, it is impossible.

13 DR. ANIGSTEIN: Okay.

14 CHAIRMAN ZIEMER: Yeah, if it's
15 impossible, it's not plausible.

16 DR. ANIGSTEIN: But the point is, I
17 would be willing to back off on that if there was
18 a plausible, believable, realistic,
19 claimant-favorable alternative. And don't see
20 one. I don't think that the 9-hour scenario, the
21 8 hours in one casing with only 1 hour -- with only,
22 what, 10 percent of the time -- a 48 minutes

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1 interruption to do another casting -- that's
2 already been discredited.

3 (Simultaneous speaking.)

4 CHAIRMAN ZIEMER: -- would be some sort
5 of plausible upper bound. Now, let me ask if any
6 of the Board Members have comments or questions on
7 this.

8 MEMBER MUNN: No, none here. These are
9 questions without solid solutions, as someone had
10 said earlier. And all we can we can do is listen
11 and try to formulate an opinion. Now, I don't have
12 any position as yet.

13 MR. ALLEN: Well, this is Dave. One
14 more thing that Bob mentioned a little bit ago, as
15 I mentioned, there are other parameters that
16 affected it. And Bob is saying that he believes it
17 is more credible that a thicker part of the casting
18 in going to show a defect than the thinner part.

19 And I'm not sure what -- I mean, I
20 certainly don't know which one would be more prone
21 to a defect. But I'm not sure why Bob is saying
22 that. Do you have any basis for saying that one,

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1 Bob?

2 DR. ANIGSTEIN: I can't establish that
3 right now.

4 MR. ALLEN: Okay, my thinking as was --

5 DR. ANIGSTEIN: Yeah, I can't -- that's
6 an opinion. I can't actually -- had I thought about
7 it, we have a metallurgist, Bill Thurber, who has
8 -- you know, is our expert on this. And however I
9 don't think he's available. I know he's on travel
10 now, so he's not available.

11 And, frankly, I did not consult him on
12 this, so I have to say it's just something that
13 strikes me as reasonable. But I can't -- I cannot
14 give you evidence for that to know --

15 CHAIRMAN ZIEMER: Well, let me ask you
16 about that, Bob. In your paper, there was indeed
17 a suggestion that there would be more defects to map
18 out simply because the casting was larger.

19 But I don't know that there's any
20 evidence of just because it's larger there would
21 more defects. Obviously, you could have a small
22 one that, for whatever reason, the way it was cast

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1 or whatever, has many defects. Or it could be a
2 large one that was well done without many defects.

3 So I think we would be hard-pressed to
4 say that there's a direct, sort of almost linear,
5 relationship between size and number of defects
6 unless there was data out there to show that. So
7 I think I tend to agree --

8 DR. ANIGSTEIN: No, I don't mean -- I'm
9 not talking about size, I'm talking about
10 thickness. It just intuitively strikes me there's
11 more chances of imperfections when you have a deeper
12 pool of molten metal.

13 But, again, basically this is like an
14 intuitive --

15 CHAIRMAN ZIEMER: Yeah, yeah.

16 DR. ANIGSTEIN: -- and I can't -- I
17 cannot back that up.

18 CHAIRMAN ZIEMER: Right, got you.
19 Okay --

20 DR. ANIGSTEIN: But I could get
21 information on it.

22 MR. RAMSPOTT: You guys could get your

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1 answer to that by asking one of the GSI experts.
2 There might be a guy on the phone that actually
3 oversaw some of the chippers and grinders who
4 actually had to chip out the flaws after the layout
5 guy found them -- or marked them out.

6 There are a lot of GSI guys. I have to
7 agree with Dr. Bob. Believe me, I'm not the NDT
8 guy, but I recall the guys saying that the thick
9 castings were the nightmares.

10 CHAIRMAN ZIEMER: In terms of the
11 numbers of flaws?

12 MR. RAMSPOTT: Absolutely. And
13 there's another side of this layout time eating up
14 a lot too because they actually had to do the outside
15 and the inside and determine what the flaw was
16 closest to, either inside or outside. And they had
17 to lay that out appropriately. They'd climbed
18 inside those castings. So thick castings were
19 definitely the nightmare for the layout guy, too.

20 CHAIRMAN ZIEMER: So for the time
21 required to lay them?

22 MR. RAMSPOTT: Yeah, for the time

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1 required on layout, sure.

2 CHAIRMAN ZIEMER: Yeah.

3 MR. RAMSPOTT: We've got GSI guys that
4 are experts and they did it, they know this answer.
5 We don't have to hear it from anybody else.

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

8 MR. PIPER: This is Don Piper. I could
9 probably give a little insight.

10 MR. RAMSPOTT: There you go. There's
11 one of the experts.

12 CHAIRMAN ZIEMER: Yeah, go ahead.

13 MR. PIPER: I'm Don Piper. Just to
14 give you a little background on myself, I started
15 in the fall of '63, sent to the new betatron before
16 it went online to set up the film library, the film
17 badge system, et cetera, okay.

18 And about a month or two months later I
19 was promoted to a foreman, which was a film reader
20 but it carried a foreman position. And then I
21 became in charge of the film readers, which was
22 salaried position. And I also filled in sometimes

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1 as the betatron foreman, which set up the shooting
2 techniques, brought the castings in, et cetera.
3 But I worked very closely with the layout people.

4 And after they laid out the casting, the
5 casting came in for shooting. And if you would
6 compare some of the nuclear sub work, like missile
7 tubes, for example, they're pretty consistent in
8 their thickness. And the quality was much, much
9 greater than other castings. So they had fewer
10 defects. You take a casting like a Westinghouse
11 turbine, these things were monsters. And so were
12 the (unintelligible) defects. I mean, they were
13 full of them.

14 And the thicknesses varied. They could
15 be anywhere from 5 inches to 18. And they were so
16 -- the contour and the convex surfaces. You may
17 have, on one side of a 14/17 area you could have 15
18 inches. But on the inside it could go down to 6.

19 So, you know, sometimes you'd have to
20 overlap your shots in order to get both thicknesses
21 because, you know, if you just did the 14 by 17 you
22 would have a white space on half of it that you

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1 couldn't read.

2 So, you know, the bigger the casting, or
3 the various types of casting, had more defects.
4 Took a lot longer to shoot. They had sometimes 200
5 or more shots on a turbine like that, and it would
6 take more than an 8-hour shift to mark the defects
7 because they also painted these with, you know,
8 white paint and outside and inside.

9 Let's see. I guess, you know, like I
10 say, it varies. The number of shots vary and the
11 time of the shots would vary due to the thicknesses.
12 And sometimes they've have 30 shots in an 8-hour
13 shift. Sometimes they'd only have ten, again,
14 depending on the thicknesses. And so anyway I hope
15 that kind of helps you.

16 CHAIRMAN ZIEMER: Yes. Thanks very
17 much. It sounds like the number of defects, this
18 kind of mottling on the sides, but also the kind of
19 component it was. Certain ones, you said, were
20 pretty clean but others were very much full of
21 defects.

22 MR. PIPER: Exactly. Well, you have to

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1 know the sequence too.

2 CHAIRMAN ZIEMER: Right.

3 MR. PIPER: It goes into the betatron,
4 it gets shot completely. It goes out to the layout
5 people and they mark all the defects. It goes to
6 the foundry for burning and re-welding and then it
7 comes back in the betatron for reshooting.

8 CHAIRMAN ZIEMER: Right.

9 MR. PIPER: And this is an ongoing
10 sequence because a lot of times they miss the
11 defects. And a lot of that's due to the shot
12 angularity, you know, because it depends on where
13 the defect is. You know, it could be laid out
14 properly but due to the angle it could be blown off
15 the one film and onto another film.

16 So, you know, and the burner is going by
17 the way it's marked. And he burns down and, you
18 know, he doesn't know whether they got it not, I
19 guess, and then they re-weld or reshoot it and it's
20 still there. So it's an ongoing process.

21 MR. RAMSPOTT: Hey, Paul, John
22 Ramspott. Can I ask Don one quick question?

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1 CHAIRMAN ZIEMER: You bet.

2 MR. RAMSPOTT: Hey, Don, did you ever
3 see castings laid out on a transfer car or tracks?
4 Did you ever get work done on those?

5 MR. PIPER: Yes, definitely.

6 MR. RAMSPOTT: Okay, Paul, this isn't
7 the first email. I've never sent you anything from
8 Don before.

9 MR. PIPER: Right. Mostly that would
10 be in a case where, on retake, and it's a hot casting
11 that needs to be shipped out as quickly as possible.
12 So, you know, it's hot on the list.

13 MR. RAMSPOTT: So it stays on the car?

14 MR. PORTER: Say it came, you know, came
15 back from the foundry for retakes. So they, you
16 know, they jump on this real quick.

17 MR. RAMSPOTT: Okay, thank you.

18 MR. PIPER: Yes.

19 CHAIRMAN ZIEMER: I think Dr. McKeel
20 had a question.

21 DR. MCKEEL: Okay. I just have a
22 suggestion I had made to Dr. Ziemer before this

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1 meeting that, to my knowledge, Brad Clawson, who is
2 a Board Member and stated several years ago that he
3 had been a radiographer, an NDT type radiographer,
4 for ten years.

5 But that's somebody -- I don't
6 understand why you all wouldn't consult with him on
7 an issue like this. He should certainly have an
8 expert opinion on that. And he's readily available
9 and a Member of the Board. So, just a suggestion.

10 CHAIRMAN ZIEMER: Okay, thank you.
11 Any other question, Board Members, or comments?

12 MR. CHUROVICH: I have a comment. My
13 name is Dan Churovich.

14 CHAIRMAN ZIEMER: Okay, go ahead.

15 MR. CHUROVICH: Yes, I worked at
16 General Steel Castings from 1951 to 1961. And I saw
17 that the tank hulls and the nose of that tank, all
18 the places were three feet thick. And they X-rayed
19 through that.

20 And it was mandatory that if they, that
21 if a tank hull came back onto the floor and was
22 reported, it had to go back through the betatron to

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1 determine whether or not it was fit, because the
2 soldiers' lives depend upon it.

3 And also made a comment about these
4 badges. And I never saw a badge. And I used to go
5 out to the betatron and wait for castings to come
6 out to make sure that they had the right casting in
7 and all this sort of thing. And I've never seen one
8 of those fill badges.

9 CHAIRMAN ZIEMER: Okay.

10 MR. CHUROVICH: So that I don't
11 understand. I know I never wore one.

12 CHAIRMAN ZIEMER: Okay. Thank you.
13 The dose reconstructions will still be able to be
14 done under the bounding (unintelligible) here.

15 I want to see if any other Board Members
16 have questions or comments. We're going to move on
17 to the other items, the other findings here very
18 quickly if you don't have any more on this one. And
19 then we'll come and see where we're going to go with
20 it.

21 Let's see, this was Finding 6 or 7?

22 MR. ALLEN: Yeah, this is Dave. I guess you

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1 wanted me to --

2 CHAIRMAN ZIEMER: Yeah, go ahead.
3 We're going to finish up the rest of the findings.

4 MR. ALLEN: Okay, yeah, because that
5 was beta dose of the layout man. Bob went over
6 these other ones earlier. And 7 was the 1966
7 inhalation intake rate. And he's right. That's
8 simply a math error on that half a year. We messed
9 up and we already agreed we would correct that.

10 The ingestion intake on Finding A,
11 again, we agreed. Bob said we overestimated quite
12 a bit on that. And we agreed, it should not have
13 been considered continuous operations with
14 uranium. It was intermittent and we should have
15 been using kind of the average time.

16 And on Number 9, it was ingestion intake
17 essentially for the first year of the residual
18 period and then that carried forward. And that,
19 again, was a copy/paste error, essentially. And we
20 will correct that. It goes down very slightly. I
21 can't remember the numbers, but it wasn't a big
22 difference.

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1 Which leaves only Finding 10, which is
2 a new finding, as Bob said. He put that in his
3 report for the first time, this latest one, I
4 believe, for this provisional review of Rev 1. And
5 that is the beta dose to the betatron operator,
6 which is calculated in the TBD but the calculator
7 then determined that the layout man or the radium
8 doses are higher, so that's the doses that are used
9 for almost everything.

10 This dose, as Bob pointed out, the way
11 it was calculated was to an effective dose when we
12 really should be using an air kerma to the guy's back
13 in a posterior/anterior geometry.

14 The background behind that is, as I said
15 earlier today, we intended to come up with an
16 estimate for the betatron operators, come up with
17 an estimate for other exposure scenarios, and then
18 compare the two for all the possibilities and pick
19 the limiting one.

20 During the discussions in the Work Group
21 those limiting ones were radium radiography in the
22 early years and layout man in the later years.

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1 However, when we were -- I can't remember if it
2 actually got into the Work Group or it came just
3 while I was putting together the Appendix.

4 But we came to the realization that,
5 over the scan of the hands and the forearms, the
6 betatron operator dose is actually higher than the
7 layout man. So we included this dose in Revision
8 1, and that is due to all the beta dose you get from
9 the uranium, handling the uranium.

10 But we included the betatron dose in
11 this one, which includes that 1,300 millirem a year,
12 which is based on the film badges. Now, this film
13 badge, as Bob said, the worst case he came up with
14 was 30 -- assuming it's very low energy photons --
15 30 keV and always coming from behind the person so
16 that the film badge is reading very little of it.

17 And in that situation it took like 204
18 millirad to a person's back to register 10 millirem
19 on the film badge. And the effective dose that was
20 originally used I still think was an effective tool
21 for the comparison with these other scenarios.
22 Because when you're talking about 30 keV photons,

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1 the dose that you're talking about to a person
2 varies drastically throughout the body, especially
3 for the skin. The skin is very variable depending
4 on where it's at. And the internal organs are
5 considerably lower than that 204 millirem.

6 In this case, once that comparison's
7 done, I mean, it wasn't close. The layout man was
8 higher. And so now I have this included for the
9 skin of the hands and forearms.

10 So, my point on this whole thing, even
11 though I know I'm rambling here a little bit, is the
12 assumption to get to that 204 is assuming that there
13 is a source to the operator's back -- coming through
14 the operator's back and registering 10 mR on the
15 film badge.

16 The only way for the hands to get this
17 204 millirem is by assuming that he's got his hands
18 behind his back all the time. And since that is the
19 only thing that's actually being used for is the
20 skin of the hands, I think it's realistic to assume
21 the hands were usually in the front of the person.

22 And if they're always in the front of the

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1 person then the film badge itself would be a
2 realistic dose, the 10 mR versus the 26 that we're
3 using. I feel the 26 accounts for at least some of
4 the time that they might be to his side or to his
5 back. But I can't imagine trying to do an estimate
6 to the skin of the hands assuming that the guys
7 always kept their hands behind them.

8 In short, I'm not sure this really needs
9 to be changed so much. I think we can go with --
10 you know, me personally -- I think we can go with
11 the 26 mR per week and write an explanation into the
12 Appendix where this shows up and essentially say it
13 accounts for some amount of time for hand behind the
14 person but primarily, you know, it is assumed that
15 they are in front of the person working. In which
16 case, we feel the estimate is reasonable and the
17 single member makes it easy to compare to the other
18 exposure scenarios.

19 I know that was a little --

20 CHAIRMAN ZIEMER: Yeah, okay.

21 MR. ALLEN: Does anybody have any
22 comments on that?

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1 CHAIRMAN ZIEMER: Well, we just need to
2 hear from SC&A. You haven't formally proposed that
3 yet, though, have you?

4 MR. ALLEN: This is the first time I've
5 talked about this, is this meeting.

6 CHAIRMAN ZIEMER: Right, you just got
7 the document, right. Bob Anigstein, any comments
8 on that? If you're commenting, you're on mute.

9 DR. ANIGSTEIN: Sorry. Yes, my first
10 comment is the problem with using the 26 is that it's
11 effective dose. And OCAS-IG-001 doesn't allow the
12 use of effective dose.

13 This was calculated specifically using
14 the dose conversion factor for effective dose, so
15 you can't just say we'll call it 26 but we'll pretend
16 it's air dose or pretend it's something else.
17 That's just technically incorrect and you have to
18 throw it. You can't use the 26.

19 And, again, it was done for comparison
20 purposes. We started off, way back in 2008,
21 thinking, well, you know, effective dose is
22 commonly used in radiation protection. It's the

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1 correct dose for radiation protection purposes.
2 But it's not the correct dose for organ dose
3 reconstruction.

4 So maybe if we had to go back in time we
5 might have used a different measure. Actually,
6 what we did do are also exposures, you know, in
7 roentgen, simply because NIOSH has exposures in
8 roentgen. But we did not do that here.

9 So air kerma is used -- it's simply a
10 multiplier to get -- if you wanted to get roentgen,
11 it's a one-to-one relationship. It's just a
12 multiplier of about 0.85, something like that, to
13 get from air kerma to roentgen. It's a fixed
14 number. It doesn't change to an energy so it
15 doesn't require a new analysis or a new model.

16 So, now, as far as the position of the
17 hands, the hands and forearms, that's certainly
18 reasonable. He doesn't have to have his arms
19 behind him. He could have his arms at his side, for
20 instance, and then the radiation would come from
21 behind, at least to that portion of the arm.

22 So I don't know quite how to handle that. But

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1 the exact number would simply -- the 26, which is
2 not applicable to this, and the -- if you use the
3 204 and the 30 keV photon as a dose conversion factor
4 and then, I don't know, have a different fraction
5 for the period of time that his arms are in front
6 of -- I don't have an answer for that. But I do --
7 I cannot agree with the 26 being used because it's
8 just not applicable.

9 CHAIRMAN ZIEMER: Okay, it looks like
10 this is going to need a little bit of work to resolve
11 the approach here since this is a new finding.
12 Board Members, other comments or questions on that?

13 MEMBER MUNN: No.

14 MEMBER BEACH: No, I agree, it needs
15 more work.

16 CHAIRMAN ZIEMER: Well, Bob, or, I
17 guess Dave, if you guys could delineate your
18 approach in writing on this. That would give SC&A
19 a chance to -- and propose something about position
20 of hands. It seemed to me that -- are we talking
21 only about the hand dose or hand and forearm?

22 MR. ALLEN: Hand and forearm.

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1 CHAIRMAN ZIEMER: Okay, so if the hands
2 are at the side then you could be talking about the
3 240, I guess, because they would be, at least the
4 back part of the hands and forearms, would be at the
5 back of the body. I mean 204. The question was,
6 would they be there all the time?

7 I mean, wouldn't that be the same as
8 being behind you, Bob -- or Dave? I'm just trying
9 to picture as a commonplace, a person standing with
10 their hands to their sides, regardless of whether
11 the hand is facing front or back --

12 DR. ANIGSTEIN: Oh, yes. Sure. Sure.
13 I mean, I think, behind, I was thinking of, you know,
14 like you were scratching your back and your hand is
15 way up and --

16 CHAIRMAN ZIEMER: No, I'm asking Dave.

17 DR. ANIGSTEIN: Sorry.

18 CHAIRMAN ZIEMER: That's all right.

19 MR. ALLEN: Yeah, we agree. That's why
20 I was kind of proposing that the 26, for lack of
21 anything better, to account for at least some of
22 that time to the side.

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1 CHAIRMAN ZIEMER: Yeah, yeah. I agree.
2 I think this is something that could be solved
3 fairly easily. It's just a matter of agreeing on
4 a number there. But we don't need to do that today.
5 I just wanted to get through all these.

6 Now, I want to go back, and on Findings
7 1, 3, 4, 7, 8, and 9, I think there is complete
8 agreement with NIOSH and with SC&A. Is that
9 correct?

10 DR. ANIGSTEIN: Correct for SC&A, yes.

11 MR. ALLEN: Can you say those numbers
12 again, Paul?

13 CHAIRMAN ZIEMER: 1, 3, 4, 7, 8, and 9.

14 MR. ALLEN: I believe that's correct.
15 Yes.

16 CHAIRMAN ZIEMER: Do you agree, Bob,
17 that that's correct?

18 DR. ANIGSTEIN: Yes.

19 CHAIRMAN ZIEMER: Well, Work Group
20 Members, can we agree to close 1, 3, 4, 7, 8, and
21 9?

22 MEMBER BEACH: This is Josie. Paul, I

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1 do agree with that.

2 MEMBER MUNN: Absolutely.

3 MEMBER POSTON: This is John. Yes, I
4 agree.

5 CHAIRMAN ZIEMER: John, yes. Wanda,
6 yes.

7 MEMBER MUNN: Yes.

8 CHAIRMAN ZIEMER: Okay, and I agree.
9 So we'll consider those closed.

10 Number 2 needs to be resolved, Number 5
11 and Number 6 and Number 10.

12 On Number 2, now, I thought that we were
13 close to being resolved. And let's jump back real
14 quickly to No. 2 and -- I'm sorry, I'm looking at
15 a tab for it. What needs to be done on 2?

16 MR. ALLEN: Well, this is Dave. I
17 think you're right. We're real close to resolve,
18 but I'm not sure about it.

19 DR. NETON: Paul, this is Jim. Doesn't
20 that depend upon the intermittent versus the
21 continuous exposure models?

22 DR. ANIGSTEIN: Hi, this is Bob. Yeah,

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1 you're right, Jim, it does. And we haven't even
2 seen the NIOSH numbers.

3 DR. NETON: Right. In a way, since the
4 beta exposure model has changed, it affects Number
5 2 as well as Number 6 because it's the same casting,
6 just a different worker.

7 CHAIRMAN ZIEMER: So, what needs to be
8 done on 2?

9 MR. ALLEN: Well, that's my question
10 too, Paul. This is Dave Allen. We have always had
11 an exposure scenario for the betatron operator as
12 far as the steel and the beta dose and et cetera.
13 And as Bob said, the math, as far as the intermittent
14 exposure, is right.

15 And we've admitted we need to add the
16 one-meter dose. So it seems like those three
17 things we're in agreement with and it's just got to
18 be put together. Is that --

19 CHAIRMAN ZIEMER: Yes, that's exactly
20 my impression, and I think you anticipated that
21 those numbers would fall into place once you did
22 that, but you have to still do it.

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1 MR. ALLEN: Granted, but I didn't want
2 to go too crazy with all the --

3 CHAIRMAN ZIEMER: No, right.

4 DR. ANIGSTEIN: No, no, one second.
5 Our betatron operator's dose is the same as the
6 layout man's dose. The exposure scenario, meaning
7 the work hours, are different. But the 30 hours of
8 prior irradiation, that's part of our model, which
9 is something that NIOSH rejects.

10 CHAIRMAN ZIEMER: Yeah, well --

11 DR. ANIGSTEIN: Therefore, we're --

12 CHAIRMAN ZIEMER: Well, there were two
13 things. One was a seven-and-a-half versus eight
14 hours. The other was the one meter business.
15 Weren't those the differences?

16 (Simultaneous speaking.)

17 DR. NETON: -- the intermittent
18 exposure versus continuous exposure to the casting.

19 CHAIRMAN ZIEMER: Oh, yeah, yeah, okay.

20 DR. NETON: The continuous hours that
21 Dave argues, or states, is impossible. And we have
22 proposed this new intermittent exposure model.

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1 Before 2, I think, can be closed, the model, we have
2 to come to some kind of agreement on what's the
3 appropriate model for the exposure to the castings.

4 MR. ALLEN: Yeah, this is for the --
5 Number 2 is for the betatron operator. And as far
6 as I know, we don't have any disagreement on the
7 scenario that was previously used on that.

8 DR. ANIGSTEIN: Well, excuse me, but
9 according to the first position paper, you said that
10 the betatron operator would be redone, but had not
11 been done. Not redone in terms of the Appendix, you
12 know, the Rev 1 differences, but an entirely new
13 model will be used.

14 MR. ALLEN: No, the plan was to use the
15 exact same model that we talked about but corrected
16 for the intermittent irradiation.

17 DR. ANIGSTEIN: Okay, that's not what
18 your response paper says.

19 DR. ALLEN: Well, it was also --

20 DR. ANIGSTEIN: It's okay if you want to
21 change it.

22 (Simultaneous speaking.)

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1 DR. ALLEN: -- was left out, the
2 one-meter dose.

3 DR. ANIGSTEIN: Your first response
4 model says, under beta skin dose, Finding No. 2,
5 beta skin dose, it says, the second paragraph, the
6 third paragraph, it says, "DCAS intends to correct
7 this in the next revision of the Appendix BB.
8 However, the original calculation assumed that it
9 would read 30 hours. DCAS intends to adjust the
10 initial dose rate to account for the intermittent
11 irradiation, as described in the White Paper, that
12 recalculates the layout man's beta dose."

13 DR. ALLEN: I think that's what I just
14 said.

15 DR. ANIGSTEIN: No, I thought you -- I
16 thought you were saying -- I'm getting very confused
17 here because what I'm hearing, what I heard before
18 was that they would go back to the doses listed in
19 Appendix BB, Rev 1 and just make the correction for
20 the one meter distance which was not included.

21 I thought that was the only change that
22 was -- I mean, I thought that was the Appendix, that

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1 was the Rev 1 and this paper now throws out the beta
2 dose back in Rev 1. It says we're going to use this
3 intermittent model. So --

4 MR. ALLEN: No, no, no, no, no.

5 DR. ANIGSTEIN: -- I'm not following.
6 Which one?

7 MR. ALLEN: Rev 1 had a number of -- a
8 number of the parameters were settled for coming up
9 with the doses for Rev 1. We made sure all the math
10 was working out correctly.

11 And its parameters, as far as how close
12 the operators were, how much time after --

13 DR. ANIGSTEIN: Yes.

14 MR. ALLEN: -- the radiation they were
15 exposed or how long they were exposed, et cetera.
16 What I'm saying is I think one of those was the one,
17 the dose rate one meter away --

18 DR. ANIGSTEIN: Yes.

19 MR. ALLEN: -- for a fraction of a time.

20 DR. ANIGSTEIN: Yes.

21 DR. ALLEN: That was left out of there.

22 DR. ANIGSTEIN: Yes.

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1 DR. ALLEN: That needs to go in. And we
2 agree that needs to go in there. But all I'm saying
3 is we're going to add that in because it's -- it'd
4 be there to start with. But we're also, instead of
5 with using 30 continuous hours --

6 DR. ANIGSTEIN: Right.

7 MR. ALLEN: -- we're going to adjust it
8 for the intermittent exposure based on the scenario
9 that we've already agree to.

10 DR. ANIGSTEIN: Okay, so you're using
11 the new scenario. You're using basically the
12 betatron operator's exposure in terms of how many,
13 how far away he is from the steel and how long after
14 the irradiation he's exposed to steel and how long
15 the setup time is. You're using that part. But --

16 MR. ALLEN: That's what I'm calling the
17 scenario, so --

18 DR. ANIGSTEIN: Yes, but, however --
19 but you're not using the calculations in Rev 1.

20 MR. ALLEN: Not the results in Rev 1,
21 no.

22 DR. ANIGSTEIN: So the change from Rev

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1 1 is not merely adding the one meter?

2 MR. ALLEN: No, like it says in the
3 write-up there --

4 DR. ANIGSTEIN: Yes. Okay, I saw what
5 it says here, and I thought what you were saying is,
6 no, no, we're sticking with Rev 1. But you're not
7 sticking with Rev 1.

8 MR. ALLEN: No, I -- if that gave you
9 that impression that's probably my bad wording.

10 DR. ANIGSTEIN: Okay, okay, okay. Okay,
11 we're -- we understand each other.

12 CHAIRMAN ZIEMER: All right, I think
13 all they need to do -- I think the ball is NIOSH's
14 court just to do that. And you can look at the
15 numbers but I think you'll be back together around
16 this one from what I can understand.

17 Dave is that -- do you agree with that?

18 MR. ALLEN: I think so. I don't know if
19 Bob's really said he agrees with this or he's got
20 an issue with this. I'm not even sure about that
21 part.

22 (Simultaneous speaking.)

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1 DR. ANIGSTEIN: Well, I had an issue --

2 DR. NETON: SC&A does not accept the
3 intermittent exposure, Bob.

4 DR. ANIGSTEIN: We accept the --- I
5 mean, I'm willing to accept the intermittent
6 exposure model. I think it's a good -- it's a nice,
7 it's a very neat mathematical correlation. But the
8 application of the model, the assumption about the
9 intermittent exposure -- in other words the
10 mathematical model is fine.

11 MR. ALLEN: Right.

12 DR. ANIGSTEIN: You reviewed and I
13 reviewed and went through laborious lengths to
14 check its derivation. However what I said before,
15 everything I said about the layout man model
16 applies, or at least much of it.

17 And this shuffling, this one casting
18 being shuttled back and forth, you know, it's --

19 DR. ALLEN: Well we're not planning on
20 -- that's not part of the betatron operator.

21 DR. ANIGSTEIN: Okay. Well, perhaps
22 we need to see it before we can comment further

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1 because we're talking about very, you know, we're
2 --

3 MR. ALLEN: We'll get the numbers
4 together. And my guess is you're going to, as far
5 as the Work Group's going to probably want me and
6 Bob to exchange files so we can check the math and
7 make sure we know what each other's doing. Is that
8 true?

9 CHAIRMAN ZIEMER: That's fine as long
10 as you don't work out any assumptions outside the
11 --

12 MR. ALLEN: State what our assumptions
13 are but don't debate them?

14 CHAIRMAN ZIEMER: Yes, right.

15 DR. ANIGSTEIN: Dave had sent me his
16 narrow spreadsheet -- his Excel spreadsheet and
17 that was very helpful to understanding the --

18 CHAIRMAN ZIEMER: Okay, so the ball's
19 in your court, NIOSH, on this one, right?

20 MR. ALLEN: That's how I understand.

21 CHAIRMAN ZIEMER: Okay. Can you work
22 on that very soon?

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1 MR. ALLEN: Yes, I can. I couldn't
2 even come close to giving you a right time frame but
3 it'll be quickly.

4 CHAIRMAN ZIEMER: Okay. Board
5 Members, any other questions on this one?

6 MEMBER MUNN: No.

7 MEMBER BEACH: None here.

8 CHAIRMAN ZIEMER: Okay, No. 5, I'm not
9 sure whose court the ball will be in on this one
10 because this one we -- you disagree on whether or
11 not to use -- NIOSH is talking about using the radium
12 or the betatron, whichever is the max. SC&A's
13 proposed use, adding some betatron to the radium
14 dose.

15 And I guess that question that would be,
16 if you did that, and I think we had a preponderance
17 of the Board Members who felt that that was the more
18 conservative approach on No. 5 and --

19 DR. NETON: Yes, Dr. Ziemer, I would say
20 that, based on discussions here today that I think
21 that NIOSH will take our discussion under
22 consideration and figure out where we're at based

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1 on what we -- I'm not saying we're changing anything
2 but I think we need to discuss among ourselves a
3 little more on No. 5.

4 CHAIRMAN ZIEMER: In other words, the
5 Work Group's sentiment was that the problem is a
6 more claimant-favorable scenario where you would
7 add to that maximum radium dose some additional
8 betatron values.

9 DR. NETON: Yes, and I'm not sure, based
10 on this, whether even giving credit for some of that
11 will be more -- it might -- it seems to me that
12 there's plausible scenarios where the betatron
13 operator's dose will be bounding no matter what we
14 do.

15 CHAIRMAN ZIEMER: Right, exactly.
16 Exactly. You may have to look at some cases to see
17 if there --

18 DR. NETON: We need to --

19 CHAIRMAN ZIEMER: -- it may seem
20 different than what it will actually work out when
21 you do that.

22 DR. NETON: Yes, so I think we need to

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1 take a little closer look at that and we'll get back
2 to you on that.

3 CHAIRMAN ZIEMER: Sure. Okay, and
4 again, that's something that you can work on soon?
5 We're asking you to.

6 DR. NETON: I'm not sure it will take
7 real long. I think there's just some calculations
8 that need to be done. And it's purely arithmetic.

9 CHAIRMAN ZIEMER: Yes, yes. I think
10 you can take some different scenarios and figure out
11 pretty rapidly what impact that's going to have.
12 We're looking for a plausible claimant-favorable
13 combination here.

14 Okay, No. 6, let's see. This is the
15 beta skin dose of the layout man. I don't know what
16 to do on that one.

17 MEMBER BEACH: That seems like we need
18 an answer from NIOSH on SC&A's paper.

19 MR. ALLEN: Oh, I'm not sure what kind
20 of answer you're looking for, Josie. I think SC&A
21 disputed several of the parameters and I think I
22 disputed back on them, and I think that's where we

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1 stand right now.

2 MEMBER BEACH: Yes, I guess I was
3 thinking SC&A came up with the last White Paper.
4 Maybe they need to do some more work on it.

5 CHAIRMAN ZIEMER: Well, let's see, we
6 have, let's see. There are several parameters here
7 that are -- okay, well we do have the issue of, that
8 what's possible and what's plausible. Don't we
9 have that issue on the 30-hour irradiation?

10 MR. ALLEN: Yes, that's one of the
11 issues in there.

12 CHAIRMAN ZIEMER: And I think, let me
13 ask. I'm thinking that SC&A maybe needs to look at
14 that. Bob, you were sort of agreeing maybe the
15 30-hour issue wasn't --

16 DR. ANIGSTEIN: I was agreeing that
17 it's the intermittent exposure with this NIOSH
18 model or modeling. As I explained in the Appendix,
19 in one way it was explained well and in another way
20 it was it left some doubt in my mind about the
21 mathematical veracity of it. But I can resolve
22 that doubt.

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1 So, yes, that's a perfectly plausible
2 approach because it's not 30 hours continuous. How
3 much difference that will make I'm not sure. But
4 already we've --

5 CHAIRMAN ZIEMER: Well, when we defined
6 plausible claimant-favorable value, I mean, I think
7 the one scenario you both were saying it's not
8 really possible. Well then, if it's not possible,
9 it's not plausible.

10 DR. ANIGSTEIN: Yes. But we've
11 already heard about that the thick castings are much
12 more troublesome so saying that the layout man spent
13 most of his time on the thin castings is not
14 defensible.

15 MR. KATZ: Paul, this is Ted. It just
16 seems to me this is one where really it's not up to
17 SC&A to think, to solve the conundrum but really,
18 it's a --

19 CHAIRMAN ZIEMER: Well, I was trying to
20 determine whether SC&A's evaluation was correct
21 because they were providing a bounding scenario
22 that's not plausible. But, yes, you're certainly

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1 right.

2 MR. KATZ: Paul, I agree, impossible is
3 sort of out of the question by definition. But I
4 think it's up to the NIOSH group to come up with then
5 a bounding scenario that, you know, holds water for
6 the Work Group. I mean, I think that's their
7 responsibility.

8 MR. ALLEN: Well, I think that's what we
9 did, Ted, with the White Paper, with -- even Bob
10 called it unrealistic that we were shuffling, you
11 know, we were, made models of seven-year shuffling
12 to castings in and out of the betatron continuously
13 until it reaches equilibrium which is --

14 MR. KATZ: But then, okay, so that's
15 what I was wondering about. But in that case what
16 you're saying is it's bounding. You know, it's
17 not, you know, it's a limiting situation that you
18 don't expect ever would -- to happen, in effect --
19 what Bob was saying at one point, which is the same
20 thing as standing beside a drum for eight hours a
21 day, something that gets done all the time.

22 So if Bob's problem is that it is not

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1 realistic to be doing that, to have that kind of
2 schedule, that's okay. That -- it's not realistic
3 to stand beside a drum all day either. But if it's
4 bounding then it seems to me then they have done
5 their job.

6 DR. ANIGSTEIN: Well, but we don't, but
7 then we're not taking into account the fact that
8 there were two betatrons for the castings group
9 coming from the second betatron as well. That's
10 one, you know, one parameter is overlooked.

11 And the other one is the, that 90 percent
12 of the time is spent on the same casting has just
13 been disputed.

14 MR. KATZ: Right, and so then that just
15 brings me back to what I was saying is that I think
16 it's up to DCAS to address those points. But it's
17 still up to them to formulate the bounding scenario,
18 not up to you, Bob --

19 DR. ANIGSTEIN: I agree.

20 MR. KATZ: -- to try to solve it.

21 DR. ANIGSTEIN: Yes.

22 MR. KATZ: Okay. And at the end of the

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1 day, Dave and Jim, if you, you know, you stand behind
2 it despite that information then, you know, that's
3 what you present at the next Work Group meeting,
4 that you stand behind it and explain the reasons
5 why.

6 MR. ALLEN: Yes, I agree.

7 MR. KATZ: Yes, okay.

8 DR. NETON: Maybe there is some rules
9 for us to look at the couple of parameters based on
10 discussion today with the amount of time spent on
11 the thin and thick castings and, I forget, there was
12 another issue.

13 But it seems like the shuffling issue,
14 I think, is okay. I mean, Dave, correct me if I'm
15 wrong. I think we could look at those other
16 parameters, just revisit them. I'm not saying
17 we're going to change them, but --

18 DR. ANIGSTEIN: I would suggest
19 considering second betatron into the mix.

20 MR. KATZ: I'm sorry, Paul, but the
21 others, I was trying to understand where things are
22 standing. And I think I do now.

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1 CHAIRMAN ZIEMER: Okay, and then No.
2 10. So NIOSH has the lead on No. 6 as well. No.
3 10, NIOSH, we'll need more on that then?

4 MR. ALLEN: Yes, I think you've already
5 asked us to --

6 CHAIRMAN ZIEMER: Right, work out the
7 details and so on. So you're going to follow up on
8 that and you're going to exchange file on that one,
9 right?

10 DR. NETON: I don't know if we're going
11 to exchange --

12 CHAIRMAN ZIEMER: Yes, you may not
13 need to. Right.

14 DR. NETON: I don't think on this one.
15 It's just more working out the logistics of the
16 exposure geometry and the --

17 CHAIRMAN ZIEMER: Okay, right. Right.
18 Okay, now let me ask about timetable here in terms
19 of the next meeting. I'd rather get another
20 meeting scheduled as soon as we can. Can we
21 schedule it today? Not schedule it today but make
22 a schedule today for the near future?

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1 MEMBER MUNN: I hope so.

2 MR. KATZ: Well, let's hear from, since
3 most of this, really, is on Dave's and Jim's back,
4 can you give us -- are you ready to give us a sense
5 for what week down the road you'll be ready by or
6 do you need some time for that?

7 DR. NETON: I don't know. I think I
8 would have to get back to you. Dave and I are going
9 to have to confer, look at schedules because, again,
10 as Dr. Ziemer pointed out, we have other things
11 going on as well.

12 MR. KATZ: Okay, well then let's not do
13 it on the phone here but let's, as soon as you and
14 Dave have gotten together and looked at your
15 schedules and can just tell us a safe week down the
16 road to put out meeting options and then I'll do
17 that.

18 DR. NETON: Okay, we'll get back to you
19 as soon as we can on that.

20 MR. KATZ: Thank you, thank you.

21 CHAIRMAN ZIEMER: Okay, and then as
22 soon as you get that information we'll need to

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1 schedule our meeting. And SC&A, you're going to be
2 on standby then because we're going to want a fast
3 turnaround for you guys too once they do this.

4 Okay, on the agenda, NIOSH update on
5 PER, I think we talked about that earlier. I don't
6 know if there's any more information that's
7 available at this time.

8 So I know that Dr. McKeel has asked about
9 that and John Ramspott starting asking about the
10 status of that repeatedly. And I think if you know
11 -- I mean, the point is the PER is on hold until this
12 work gets done. I think that's what I heard.

13 DR. NETON: And that is currently the --

14 CHAIRMAN ZIEMER: Yes.

15 DR. NETON: -- the way it's set up,
16 right?

17 CHAIRMAN ZIEMER: Okay --

18 MEMBER BEACH: Hey, Paul?

19 CHAIRMAN ZIEMER: Yes.

20 MEMBER BEACH: This is Josie. I have a
21 question. It's just a small question for Dave back
22 on Dan McKeel's paper, that 87-page paper. On Page

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1 8 I just noted that, the second paragraph, Dan had
2 talked about a FOIA that he had received.

3 And then it talked about GSI medical
4 records. And -- I'll give you time to look at that.
5 Anyway, it says that there were some medical records
6 that were taken to GSI corporate headquarters in St.
7 Louis. And it said that NIOSH had not tried to
8 retrieve those.

9 And I just had a quick question on that,
10 if that was correct or are you aware of any medical
11 records that could possibly be found?

12 MR. ALLEN: I'm not aware of any.

13 MEMBER BEACH: Yes, it's just a
14 question I have that --

15 MR. ALLEN: I haven't got that paper
16 open right now, but --

17 MEMBER BEACH: It's on Page 8 and it's
18 the second paragraph. So I was just curious if that
19 is an avenue that you could look at if that is indeed
20 correct.

21 MR. ALLEN: Well, I don't have it open
22 just right now. What was the context of that?

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1 What medical records?

2 MEMBER BEACH: It just X-ray
3 examinations. And this worker had stated, and that
4 he had file cabinets with employee medical records
5 that were spared when they were destroying records.
6 And they had moved those to corporate office. So
7 anyway I was just curious about that, and those
8 records, if they are retrievable.

9 DR. NETON: Well, Josie, I recall
10 reading that. I think there was some reference to
11 diagnostic X-rays.

12 MEMBER BEACH: Yes, it did say that.

13 DR. NETON: They were talking about an
14 X-ray they wouldn't count in this program.

15 MEMBER BEACH: Right. Yes.

16 DR. MCKEEL: This is Dan. May I
17 comment, please?

18 CHAIRMAN ZIEMER: Yes.

19 DR. MCKEEL: Since you're talking about
20 my paper, now what I said didn't, wasn't talking
21 about diagnostic X-rays. One of the workers who,
22 GSI workers, who is still alive and lucid said that

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1 he observed when large amounts of the GSI corporate
2 records were destroyed, and he was told to help with
3 that and did.

4 But, he said, on that same day there were
5 three or four, if I remember the testimony -- which
6 is off the record -- file cabinets that were moved
7 from the Granite City, Illinois site over to GSI
8 Corporate Headquarters. They have an office on the
9 Missouri side and that's where he, that's where this
10 worker thought those records went.

11 My point is there were other information
12 from the workers at the Granite City place but
13 records might have gone, to other divisions at GSI
14 and so forth.

15 And my comment was simply that if, to my
16 knowledge, none of those records, including the old
17 film badge records and things like that -- I'm not
18 aware that NIOSH made any effort to try to find those
19 by FOIA, by writing letters, you know, things like
20 that that when I did that and wrote to Landauer and
21 wrote FOIA requests and so forth I turned up film
22 badge information that they existed and I turned up

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1 the fact that all those new sources, including the
2 radium sources existed at GSI and so forth.

3 So it was a comment like that. I guess
4 that would be characterized as an editorial
5 comment. But the way I meant it was I think
6 somebody should look for those records, just like
7 I think they should look for the old film badge
8 records in every nook and cranny possible,
9 including trying to get records from Mallinckrodt,
10 for instance, where those old film badge records
11 could be February 27, 2015.

12 I think, really, I'm about the only one
13 who's tried real hard to find those film badge
14 records prior to 1963 and the Landauer film badge
15 program. But everybody seems to accept, without
16 question, that they existed.

17 My question is where are they? If they
18 existed who had them? We don't even know the film
19 badge vendor. So anyway, that was the point of my
20 observation.

21 DR. NETON: Dr. McKeel, just for the
22 record, I'm looking in your write-up on Page 8 and

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1 it says the NRC FOIA documents clearly indicate
2 there was a resident in-house medical staff and that
3 diagnostic X-ray exams were performed. And you
4 mentioned diagnostic X-ray several times.

5 (Simultaneous speaking.)

6 DR. MCKEEL: And all that's true.

7 DR. NETON: Are you saying they
8 weren't? That's what it says here, sir.

9 DR. MCKEEL: Jim, let me tell you
10 something, you, when John Ramspott and I submitted
11 our critiques of Appendix BB Rev 0 in 2007 NIOSH
12 responded in full to each of us separately with a
13 detailed rebuttal or answers to our critique.

14 This time NIOSH decided not to do that.
15 SC&A decided not to do that. So I'm not going to
16 sit here today and try to remember from vague
17 recollections what, I mean, exactly what I said just
18 now.

19 That wasn't the reason I was thinking
20 about. I don't remember in detail what's on Page
21 8. But it is true that they have an in-house doctor
22 at GSI and they did give diagnostic X-rays and we

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1 all understand.

2 Some X-rays are included in individual
3 dose reconstructions. So if some of those records
4 actually went -- and basically NIOSH never finds the
5 chest films and things like that. And they never
6 look for them because they can revert to a TIV
7 document that assigns a standard dose.

8 So, you know, that's all I was
9 commenting. Here's a site where maybe the
10 diagnostic records and other medical records could
11 be found. That was the point of my comment.

12 I stand by everything in my paper. And
13 I just put it on the record again. I don't think it's
14 been commented upon the way it should be.

15 CHAIRMAN ZIEMER: So you have one other
16 comment and then, Josie, I'll just mention that on
17 those, even if they found those medical records, it
18 would not include dose information. People
19 wouldn't keep track of X-ray doses when they took
20 chest X-rays.

21 So even if you had the chest X-rays you'd
22 still have to reconstruct the dose using standard

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1 methods that are used here while using --- if we
2 don't have the information. I'm not sure it would
3 change what NIOSH would do on dose reconstruction
4 --

5 DR. MCKEEL: I can -- Paul, this is Dan
6 McKeel again. I can tell you, give you an example
7 of where it could affect things.

8 If a worker had an exposure instance, an
9 over-exposure instance which we know they did, you
10 know, it could have been that X-rays were taken as
11 a result of that. And so those records and the
12 results and the medical records.

13 We have testimony from a man who
14 described getting an overdose at GSI and having
15 their white blood cell count decrease. And, it's
16 not clear whether those studies were done at GSI or
17 done at a hospital. I think they were done at both
18 places. So the medical --

19 CHAIRMAN ZIEMER: Yes, I would agree
20 with that, I was only referring to the assignment
21 -- the occupational X-rays from --

22 (Simultaneous speaking.)

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1 DR. MCKEEL: I understand.

2 CHAIRMAN ZIEMER: Yes, that's all I was
3 referring to.

4 DR. MCKEEL: Okay, thank you.

5 CHAIRMAN ZIEMER: Okay, one other thing
6 and then we did have on our list here, the material
7 that was sent out about the non-compliance memos.
8 And I think, Dan, you spoke to those earlier in your
9 comments.

10 Though I will put it on my note to
11 include that here but I think you have already
12 spoken to that. Did you have anything else on that
13 issue, on the materials that were sent out a day or
14 two ago?

15 DR. MCKEEL: No, sir. I don't have
16 anything more about that but I do want to make a
17 plea. And it seems to me that at every -- I attend
18 every one of these Work Groups.

19 But one of the things that I sense as a
20 highly interested and informed observer is what I
21 try to carry away from here is exactly what you all
22 decided. And, I tell you, I cannot get it in my

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1 notes.

2 It seems to me that there is a lot of
3 things we can do that, we will do that, we agree.
4 But I can't put down on paper what doses were agreed
5 to, who suggested what doses. It would be
6 extremely valuable to summarize, in a paragraph,
7 exactly what was decided about Findings 2, 5, 6 and
8 10.

9 And on the issues of agreement, it
10 wouldn't be too hard to summarize those doses. We
11 agree, and the doses we agreed to are -- you could
12 cite something in Appendix BB 1. But it's very
13 confusing about what was actually decided today.

14 And I believe that's the reason why
15 we're talking about beta skin dose that SC&A claims
16 that they calculated back in 2008 -- why six years
17 later we're still talking about that issue.

18 And I just think it would help things a
19 lot to be precise about what was decided today and
20 then you could say, okay, here's what we agreed to.
21 And then when we all get back together again, which
22 could, again, be weeks to a month, then we'd know

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1 where the start point is.

2 So I'm just suggesting that would be a
3 very welcome thing, at least for me. I can't speak
4 for other people.

5 CHAIRMAN ZIEMER: Okay. And you
6 understand that in terms of the actions, in closing
7 Items 1, 3, 4, 7, 9 -- and I guess you're asking --
8 in closing those what does that mean in terms,
9 specific doses? Is that what you're asking?

10 DR. MCKEEL: That's right. Closure
11 means we're through with this issue. But what you
12 have not done is you have not learned and
13 ascertained and signed off on the final numbers that
14 should result from that agreement.

15 And I think that's the wrong way to do
16 it. I think you should see the numbers and have
17 SC&A and NIOSH say we agree on these specific
18 numbers, and then close the item.

19 CHAIRMAN ZIEMER: Well, I think that's
20 why 2, 5, 6 are still open --

21 DR. MCKEEL: But I'm saying even on the
22 items that are closed I believe there are still --

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1 that there still needs, before you close them, a,
2 you know, an agreement on exactly what numbers are
3 agreed to. And then there wouldn't be surprises.

4 There are some surprises in Appendix BB.
5 As Dave Allen has explained very clearly and well
6 today, that there were certain measurements that
7 were not taken or not calculated that they had to
8 calculate outside of the Work Group and put into
9 Appendix BB Rev 1.

10 And all I can say about that is it's
11 going to eat up additional time to get that all done
12 in Rev 2 of Appendix BB. And, personally, it's not
13 a matter about me. It's about the, with denied
14 claims. You need to have those claims reopened and
15 reworked.

16 So I just -- I'm sorry to have to take
17 up so much time to --

18 CHAIRMAN ZIEMER: No, that's fine. I
19 appreciate your comments. Yes, any other
20 comments, Board Members? Questions?

21 All right, Wanda, anything procedurally
22 we need to do?

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1 MEMBER MUNN: I don't believe so,
2 unless there's an easier way to address these
3 issues.

4 MR. KATZ: I think you're all set, Paul.

5 CHAIRMAN ZIEMER: Okay. All right,
6 now we're adjourning the meeting and I thank you
7 all.

8 DR. MCKEEL: Paul?

9 CHAIRMAN ZIEMER: Yes.

10 DR. MCKEEL: Sorry, I do have one thing.

11 CHAIRMAN ZIEMER: Oh.

12 DR. MCKEEL: But I realize this is the
13 only chance I'll ever have. Bob Anigstein said that
14 the interviews that he published and reproduced in
15 his last paper with the GSI workers went to the
16 original Procedures Review Work Group, not the
17 Subcommittee but the Work Group.

18 So my question is that Work Group is out
19 of business. But is, can somebody check and see
20 were those emails -- get posted to the DCAS website
21 and are they available in a document listed under
22 the old Procedures Review Work Group, which I know,

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1 some of those transcripts are on the website.

2 CHAIRMAN ZIEMER: A Procedures Review
3 Subcommittee?

4 MR. KATZ: Actually, that's not the
5 place to go for it. Bob, are you still on the line?

6 DR. ANIGSTEIN: Yes, I'm here.

7 MR. KATZ: If you would just --

8 DR. ANIGSTEIN: Well, I can answer that
9 question.

10 MR. KATZ: Yes, thank you.

11 DR. ANIGSTEIN: These are, these were
12 transmitted in an email. And, of course, two of the
13 Members of the Procedures Work Group are here now.
14 And Dr. Ziemer and Ms. Wanda Munn. And the -- no,
15 they were not posted and they couldn't be posted
16 because they were not redacted.

17 Now, however, that entire body of
18 correspondence is the last 12 pages of the January
19 26th report contains it. For the ones for members
20 of the public are redacted. The Members of the Work
21 Group and NIOSH are not redacted. The redaction is
22 the names and all other type of identifying

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1 information.

2 So that information, there were other
3 emails, there were other memos that are not relevant
4 to the issues under discussion today so I did not
5 include them. I have a, I do have others. All of
6 these --

7 DR. MCKEEL: It seems to me that those
8 complete interviews should be put on the record some
9 way.

10 DR. ANIGSTEIN: The -- I have, the
11 interview itself is cited but not recorded. You
12 know, it's a voice so obviously you can't post the
13 voice interviews.

14 One interview, one and only one
15 interview I cited in the report, in the 2008 report
16 -- and I'll repeat it -- the others are emails and
17 the email attachments. And all of these are as an
18 attachment to my, to the January 26th report. And
19 that is all contained, the last 12 pages contain
20 that information.

21 And, furthermore, much of it was relayed
22 to me by John Ramspott who -- obviously on copy of

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1 it. So I'm sure the two of you, Mr. John Ramspott
2 and Dr. McKeel, have access to the originals which
3 --

4 DR. MCKEEL: No, I --

5 DR. ANIGSTEIN: We cannot release them
6 because they're PA protected. But if you have
7 then, obviously --

8 DR. MCKEEL: What I'm asking is does
9 somebody have those original reports?

10 DR. ANIGSTEIN: I have the -- I have the
11 original -- apparently, I'm not making myself
12 clear. I have the original emails --

13 DR. MCKEEL: No, I mean other than you.

14 DR. ANIGSTEIN: They're in my, they're in
15 the report that was submitted on January 26th. Now
16 what more do you want?

17 DR. MCKEEL: Well, for one thing --

18 CHAIRMAN ZIEMER: The originals.

19 DR. ANIGSTEIN: Pardon?

20 MR. KATZ: Yes, what Bob, is saying is
21 that all of the information he has provided as an
22 attachment to that report.

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1 DR. MCKEEL: I understand. All right,
2 thank you.

3 CHAIRMAN ZIEMER: Oh, I did want to ask
4 if Patricia Jeske had any comments or questions. I
5 didn't, I -- sorry I neglected to.

6 MR. CHUROVICH: Mr. Chairman, I would
7 like to have a comment.

8 CHAIRMAN ZIEMER: Now who is this,
9 please?

10 MR. CHUROVICH: This is Dan Churovich
11 again.

12 CHAIRMAN ZIEMER: Okay. Make it
13 quick.

14 MR. CHUROVICH: Well, I was in Atlanta
15 in 1951 when I left high school and started to work
16 with the Commonwealth that fall. And I've been ten
17 years or better trying to get resolution to my case.

18 And I don't understand why there's so
19 much difference between the case where a person has
20 a skin cancer or if someone has rectal cancer. And
21 I don't inhale anything or do that to my body. I
22 used to ride on those cars after they came out of

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1 the betatron, occasionally. I didn't do it all the
2 time, but occasionally I rode on them.

3 And I was just wondering if -- why it was
4 that years was after the first close, ten years or
5 more, 20 years almost, when they took up on the river
6 crest because they were so hot from radiation.
7 That, I don't understand.

8 CHAIRMAN ZIEMER: I'm not sure I'm
9 understanding the question. Are you asking why
10 they took it out?

11 MR. CHUROVICH: No, I'm trying to
12 understand why it's taking so long to get some kind
13 of resolution. Somebody to make up their mind and
14 say this person's going to be favored, this person
15 is not going to be favored and forget about it.

16 CHAIRMAN ZIEMER: Oh, well, yes, that's
17 not an easy question to answer. I mean you're the
18 individual. Obviously the process has taken long
19 and we wish it would go faster --

20 MR. CHUROVICH: Well, I turned down two
21 jobs that paid me more money because they had
22 radioactive materials being worked on there. And

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1 I went to work in the Commonwealth and thought I was
2 safe and I found out that in 19 -- I left there in
3 1961 and I found out in 2004 that they had
4 radioactive castings there that they were X-raying
5 and that just blew my mind.

6 CHAIRMAN ZIEMER: Well, I'm sorry that
7 I can't give you a good answer for your question.
8 All right, I did want to ask Patricia -- is she still
9 on the line or she had a comment. Go ahead.

10 I guess maybe Patricia Jeske's not here?
11 Or if you're on Patricia, you may be on mute.

12 Okay, if not I'm going to adjourn the
13 meeting and I thank everybody for their
14 participation. We are hoping to meet again soon.
15 We'll let you know when.

16 (Whereupon, the meeting in the
17 above-entitled matter was concluded at 3:15 p.m.)
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