

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

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ADVISORY BOARD ON RADIATION AND
WORKER HEALTH

+ + + + +

WORK GROUP ON THE SAVANNAH RIVER SITE

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TUESDAY,
JANUARY 19, 2010

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The Work Group convened in the Zurich Room of the Cincinnati Airport Marriott Hotel, 2395 Progress Drive, Hebron, Kentucky, at 9:30 a.m., Mark Griffon, Chairman, presiding.

PRESENT:

MARK GRIFFON, CHAIR
BRADLEY CLAWSON, MEMBER
MICHAEL GIBSON, MEMBER
JAMES LOCKEY, MEMBER
PHILLIP SCHOFIELD, MEMBER

ALSO PRESENT:

TED KATZ, Designated Federal Official
NANCY ADAMS, NIOSH Contractor*
ISAF AL-NABULSI, DOE*

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ALSO PRESENT (Cont'd):

MEL CHEW, ORAU*
EMILY HOWELL, HHS
JENNY LIN, HHS
MIKE MAHATHY, ORAU*
ARJUN MAKHIJANI, SC&A
STEPHEN MARSCHKE, SC&A*
JOHN MAURO, SC&A*
JIM NETON, NIOSH, OCAS
KATHRYN ROBERTSON-DEMERS, SC&A*
LAVON RUTHERFORD, NIOSH, OCAS*
TIM TAULBEE, NIOSH, OCAS
BOB WARREN, ESQ., FOR JOHNNY WILLIAMS*

*Present via telephone

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

(9:31 a.m.)

MR. KATZ: Good morning, everyone in the room and everyone on the phone.

This is the Advisory Board on Radiation and Worker Health, the Savannah River Site Work Group.

We are getting started, beginning with roll call, Board members in the room, and let me remind everyone involved with the agencies, and so on, to speak to whether you have a conflict of interest, as well.

CHAIRMAN GRIFFON: The Board first?

MR. KATZ: Yes.

CHAIRMAN GRIFFON: Mark Griffon, chairing the Work Group, and no conflict with Savannah River.

MEMBER LOCKEY: Jim Lockey, Advisory Board. No conflict.

MEMBER GIBSON: Mike Gibson. No conflict.

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1 MEMBER SCHOFIELD: Phil Schofield.

2 No conflict. Board member.

3 MEMBER CLAWSON: Brad Clawson,

4 Board member. No conflict.

5 MR. KATZ: Great. And then, do

6 we, by any chance, have any Board members on

7 the line?

8 (No audible response.)

9 Okay then, NIOSH ORAU team in the
10 room?

11 DR. NETON: This is Jim Neton,

12 OCAS. No conflict.

13 DR. TAULBEE: Tim Taulbee, OCAS.

14 No conflict.

15 MR. KATZ: And NIOSH ORAU team on

16 the line?

17 MR. CHEW: Mel Chew. No conflict.

18 ORAU team.

19 MR. KATZ: Mel Chew.

20 Okay, then SC&A in the room?

21 DR. MAKHIJANI: Arjun Makhijani.

22 No conflict.

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1 MR. KATZ: And on the line, SC&A?

2 DR. MAURO: John Mauro, SC&A. No
3 conflict.

4 MR. KATZ: John Mauro.

5 MR. MARSCHKE: Steve Marschke,
6 SC&A. No conflicts.

7 MR. KATZ: Okay, and then HHS and
8 other government officials or government
9 contractors in the room?

10 MS. HOWELL: Emily Howell, HHS.

11 MS. LIN: Jenny Lin, HHS.

12 MR. KATZ: And on the line?

13 MS. ADAMS: Nancy Adams, NIOSH
14 contractor.

15 MR. KATZ: Nancy Adams.

16 MS. AL-NABULSI: Isaf Al-Nabulsi,
17 DOE.

18 MR. KATZ: Welcome, Isaf.

19 MS. AL-NABULSI: Thanks.

20 MR. WARREN: This is Bob Warren,
21 representing Johnny Williams.

22 MR. KATZ: All right, do we have

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1 any other government folks on the phone?

2 (No audible response.)

3 Okay. Then, members of the public
4 and congressional staffers on the line?

5 Will you repeat that, whoever it
6 was who started?

7 MR. WARREN: It's Bob Warren.

8 MR. KATZ: Oh, Bob, right.

9 MR. WARREN: I'm the lawyer for
10 Johnny Williams, one of the petitioners.

11 MR. KATZ: Right. Welcome, Bob.

12 MR. WARREN: Okay.

13 MR. KATZ: Other members of the
14 public?

15 (No audible response.)

16 Okay. Then, let me just remind
17 all of you on the line to please mute your
18 phones, except when you're addressing the
19 group. *6 if you don't have a mute button.
20 Use *6 again to come off of mute, and please
21 do not put the phone on hold, but call back in
22 if you need to disconnect for a while.

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1 Thank you.

2 Mark.

3 CHAIRMAN GRIFFON: Okay. We might
4 have had an SRS Work Group before, but it was
5 before the petition. So this is going to
6 focus on the SEC review, and not so much on
7 the site profile issues. I think, obviously,
8 it is more important that we review the SEC
9 issues.

10 I think in my email I put out a
11 very brief agenda, but, basically, I think the
12 main focus here is going to be the review.
13 SC&A prepared this SEC issues matrix. Note
14 the title. It's not all the site profile
15 issues, like we often do the matrices, but
16 this is SEC issues only on this. So we do
17 have another matrix out there, but, for now,
18 we are going to focus on these ones that SC&A
19 has pulled out.

20 Then, at the end of the meeting, I
21 want to just get a sort of update on status
22 and timing of some things. I think that

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1 there's still some outstanding work going on
2 by NIOSH for certain issues.

3 So I don't expect in these matrix
4 issues that we are going to necessarily have
5 NIOSH respond for all these, but at least we
6 will get an update on where things stand and a
7 review for us on the Work Group of what the
8 issues are, so we can get moving on this a
9 little more efficiently from here on out.

10 The one thing I did want to call
11 some attention to right upfront, and this is,
12 I guess it is sort of a question, but also
13 something for the Work Group and everyone here
14 to consider. The SEC evaluation report
15 focused on construction workers. It is
16 unclear to me, it seems to me that the entire
17 petition was qualified, and the petition
18 included non-construction and construction
19 workers, in other words, all workers.

20 I know that NIOSH, in their
21 evaluation report, changed the class
22 definition to be considered, but I thought it

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1 was up to the Board to consider any qualified
2 petition. So I guess I am asking, what is the
3 scope of our review here. I think it should
4 be all workers in our approach, rather than
5 just focusing on construction workers.

6 And actually, from a practical
7 standpoint, I think it is going to end up kind
8 of that way anyway. But, first, I sort of
9 wanted to get, I guess, the legal discussion
10 out there. You know, how was the petition
11 qualified? Then, I believe we are supposed to
12 review the qualified petition.

13 And even though NIOSH, and I'm not
14 objecting to this, NIOSH changed the class
15 definition in their evaluation report, but I
16 don't think they made the petitioner or they
17 didn't disqualify the original petition. They
18 just proceeded on the original petition.

19 Is that correct?

20 DR. TAULBEE: Please.

21 MS. HOWELL: If someone can tell
22 me what qualified? I mean I know what is in

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1 the evaluation report. Is that the class that
2 qualified?

3 DR. TAULBEE: That's the class
4 that qualified. There were three petitioners.
5 One was construction trades worker, and then
6 two others were production workers.

7 Really, what qualified the
8 petition was the analysis that had been
9 conducted by CPWR indicating that there was a
10 deficiency among construction workers in the
11 HPAREH database, and that was the component
12 that qualified the petition. So that was
13 where we focused, the construction trades.

14 CHAIRMAN GRIFFON: So there were
15 three separate petitions written. I didn't
16 understand that.

17 DR. TAULBEE: There were three
18 petitioners on the one petition.

19 CHAIRMAN GRIFFON: Okay.

20 DR. TAULBEE: And then there was
21 one additional one that we merged together.
22 That would be SEC 104.

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1 CHAIRMAN GRIFFON: Okay.

2 DR. TAULBEE: But the other three
3 people were all production workers, and there
4 was one construction trades worker on the
5 petition. Due to the information provided by
6 the petitioners, it was basically the CPWR
7 study as well as other components that
8 qualified the petition. And that was why we
9 just qualified the construction trades
10 workers, is there wasn't information provided
11 to us indicating lack of monitoring or lack of
12 our ability to reconstruct doses for all their
13 regular production workers.

14 CHAIRMAN GRIFFON: So did
15 anyone -- I know in the past there's always
16 attempts for you to go back to a petitioner
17 and say, listen, we didn't qualify in this
18 area. If you have other information that you
19 can provide, we would be willing to
20 reconsider. Or was there any follow-up with
21 the petitioner on this? Because I think they
22 came to us at a meeting and were a little

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1 concerned about the fact that it had been cut
2 that way.

3 I just hate to have another
4 petition come in later, when we can be
5 considering both now. Actually, almost all
6 the construction worker stuff depends on non-
7 construction worker bounding approaches. So
8 why don't we just -- it seems, from a
9 practical standpoint, it might make more sense
10 just to consider it altogether anyway.

11 Go ahead, Jim.

12 DR. NETON: Well, I am looking at
13 the Petition Evaluation Report, and the
14 petitioner asked for a review of all
15 construction workers, and that's what we
16 followed up with.

17 CHAIRMAN GRIFFON: No, no, no.
18 They asked for all construction and non-
19 construction workers.

20 DR. NETON: Oh, all other workers?
21 I'm sorry.

22 CHAIRMAN GRIFFON: Yes, and all

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1 other workers.

2 DR. NETON: I missed that all
3 other workers.

4 CHAIRMAN GRIFFON: Right, right.

5 DR. NETON: It's been a while
6 since I looked at this. Okay.

7 CHAIRMAN GRIFFON: Yes. Me, too.
8 I was reviewing this sort of last night and
9 on the plane.

10 DR. NETON: You know, LaVon
11 Rutherford would be in a better position
12 probably to address how we ended up with that
13 class. I am not sure we didn't look at that.

14 DR. TAULBEE: We did look at it,
15 and we looked at what the basis for qualifying
16 the petition was. And the only basis in what
17 was supplied was the construction trades
18 workers. That was why we narrowed the class.

19 DR. NETON: Right.

20 DR. TAULBEE: Did we follow up? I
21 don't believe that we did.

22 DR. NETON: Okay.

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1 CHAIRMAN GRIFFON: Yes, I'm just
2 thinking, a lot of the issues overlap. If it
3 makes sense, if we are going to put a lot of
4 effort into this Work Group working on similar
5 issues, then why not consider it all at once
6 instead of splitting it?

7 DR. NETON: I am looking in the
8 summary of the evaluation report. It says,
9 based on its preliminary research, NIOSH
10 modified the class. So, somewhere in here,
11 I'm presuming there's some sort of discussion
12 about that.

13 DR. MAKHIJANI: I think it is very
14 minimal.

15 CHAIRMAN GRIFFON: What I could
16 find was very minimal.

17 DR. MAKHIJANI: Yes, it's very
18 minimal.

19 And just to kind of throw this
20 into your pot for consideration, since we are
21 required to review the construction worker
22 petition, if the Board charges us, and this

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1 evaluation report, in a preliminary way, we
2 compiled -- we looked at your compiled
3 claimant database for non-construction and
4 construction workers, since you linked the two
5 in terms of your ability to reconstruct dose
6 for construction workers.

7 We did find some issues with non-
8 construction workers as well construction
9 workers.

10 CHAIRMAN GRIFFON: Even non-
11 construction workers?

12 DR. MAKHIJANI: Non-construction
13 workers as well as construction workers.

14 MR. KATZ: Maybe we want to get
15 someone to have LaVon call in at some point to
16 talk about the qualifications. But I think,
17 and you can correct me if I'm wrong, but I
18 believe that, if what's qualified, NIOSH
19 defines the scope according to what's
20 qualified, that's the scope that could be
21 considered by the Board until such time as
22 there is a petition to expand that scope or

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1 NIOSH has the prerogative, I think, to expand
2 the scope on basis, but I don't think the
3 Board could do that.

4 CHAIRMAN GRIFFON: No, no, no.
5 That's why I'm asking.

6 MR. KATZ: Yes.

7 CHAIRMAN GRIFFON: Yes, we are
8 bound to review qualified petitions, right.

9 MR. KATZ: Yes.

10 CHAIRMAN GRIFFON: So I understand
11 that.

12 But the other thing, and it won't
13 prohibit us from making some progress today,
14 but the only reason I was saying that is I
15 think, if we're going to, in three months, get
16 another petition from these same people, and
17 then it qualifies --

18 MR. KATZ: But I don't think that
19 would be necessary because, if NIOSH comes to
20 the judgment that it is sufficient beyond the
21 scope --

22 CHAIRMAN GRIFFON: Yes.

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1 MR. KATZ: -- that it is already
2 defined for a class, it can expand that scope.

3 CHAIRMAN GRIFFON: Right, either
4 that way -- yes, either of those ways.

5 MS. HOWELL: Well, I mean, if they
6 are in the process of it, then they can expand
7 the one that is being looked at. I mean, it
8 is slightly dependent. If there is a
9 different period of time involved, then you
10 might have parallel petitions or something,
11 too.

12 DR. TAULBEE: One of the things
13 that we'd like to clarify a little bit, when
14 you indicated that we didn't do much follow-
15 up, we did conduct a worker outreach meeting
16 down there at the Savannah River Site to try
17 to solicit more information on people. And if
18 we had gotten anything during that time
19 period, then I think we would have expanded.
20 But during that two-day meeting, there wasn't
21 any information provided that we felt would
22 qualify production workers for inclusion in

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1 the class during that time period.

2 DR. MAKHIJANI: I just had kind of
3 a question as to how we looked at the
4 evaluation report when the Board asks us to do
5 that.

6 Because in the evaluation report
7 it says what the petitioner-requested class
8 was, so I am presuming in the petition that
9 was qualified that's what the petition asked
10 for.

11 CHAIRMAN GRIFFON: That's why I
12 was confused, yes.

13 DR. MAKHIJANI: So I am still
14 confused, I have to say, because normally --

15 CHAIRMAN GRIFFON: Normally, NIOSH
16 won't qualify it.

17 DR. MAKHIJANI: Normally, the
18 requested class recognition --

19 CHAIRMAN GRIFFON: They'll send it
20 back and they'll rewrite and get a
21 redrafted --

22 DR. MAKHIJANI: Yes. Yes,

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1 normally, the requested class definition in
2 the qualified petition is presented in the
3 evaluation report, and NIOSH sometimes
4 modifies based on dates or whatever. Whenever
5 it considers it has dose reconstruction data,
6 it may split it up into two or three pieces.
7 We're used to that, but we're not --

8 CHAIRMAN GRIFFON: Yes, it is
9 presented a little differently than I have
10 seen it before. That is why I was wondering
11 what exactly --

12 DR. MAKHIJANI: This seems to be
13 the first time -- yes.

14 CHAIRMAN GRIFFON: Yes, right.

15 DR. MAKHIJANI: So it is a little
16 confusing.

17 CHAIRMAN GRIFFON: We might want
18 to follow up on that and just consider
19 further. I mean, as we go through issues, I
20 guess there's two ways, as Ted said. Either
21 to have someone else submit a petition on
22 behalf of the production side or, if we can

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1 convince NIOSH that there are some issues that
2 are both construction and production issues,
3 then maybe you will self-identify, or
4 whatever, and include it.

5 But I think, it seems to me
6 anyway, looking through these issues, that
7 several of them at least are going to be both
8 production- and construction-worker issues.
9 Whether anything comes out of it at the end of
10 the day is another story. That's part of the
11 review, but it seems to me it would be more
12 efficient to review it all at once.

13 So, as we go through it, maybe I
14 will just ask NIOSH to keep that in their
15 mind. Then, if they want to self-identify,
16 that might make the process easier, more
17 streamlined.

18 MR. KATZ: It probably won't
19 affect your discussion that much --

20 CHAIRMAN GRIFFON: Right, right.

21 MR. KATZ: -- because they're
22 intertwined.

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1 CHAIRMAN GRIFFON: Exactly.

2 DR. MAKHIJANI: Yes, not at this
3 stage.

4 CHAIRMAN GRIFFON: All right.

5 MS. ADAMS: Mark, this is Nancy.

6 I sent Bomber an email for you
7 guys. So he may pop in here.

8 CHAIRMAN GRIFFON: Okay.

9 MR. KATZ: Thank you, Nancy.

10 CHAIRMAN GRIFFON: Thank you,
11 Nancy.

12 MS. ADAMS: Okay.

13 DR. MAKHIJANI: Mark, just as
14 reminder, there's also a reference that I
15 could not find on the O: drive which refers to
16 this matter, which is a memo written by
17 Branche?

18 CHAIRMAN GRIFFON: Yes. A memo
19 which we assumed was Christine Branche.

20 DR. MAKHIJANI: Christine Branche
21 in 2008; I couldn't find it.

22 CHAIRMAN GRIFFON: Which might

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1 answer this question of how they qualified or
2 didn't qualify.

3 DR. TAULBEE: Yes, thank you for
4 mentioning that.

5 CHAIRMAN GRIFFON: Yes.

6 DR. TAULBEE: Because now it does
7 remind me of what all took place. Thank you.

8 (Laughter.)

9 CHAIRMAN GRIFFON: It's all coming
10 back.

11 DR. TAULBEE: Yes, it does now.
12 The petitioners who did not qualify filed an
13 appeal, and that was sent to the NIOSH -- what
14 do you call it? The independent --

15 MR. KATZ: Evaluation Panel.

16 DR. TAULBEE: Right, yes. And
17 they looked at our qualification process as
18 well, and they concurred with our decision to
19 just qualify the construction trades workers.

20 So it did go through the whole appeal
21 process, the other two individuals.

22 CHAIRMAN GRIFFON: And that memo

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1 has the panel review, right?

2 DR. TAULBEE: That is correct, and
3 that is Christine.

4 DR. MAKHIJANI: Because it is one
5 of the references in your ER.

6 DR. TAULBEE: Yes.

7 CHAIRMAN GRIFFON: Okay.

8 DR. MAKHIJANI: I just couldn't
9 find it.

10 CHAIRMAN GRIFFON: Yes, if we
11 could find a copy of that or if someone can
12 find a copy of that? I'm not sure it's easy
13 to find on the --

14 DR. TAULBEE: It's on our SEC
15 document locator pages.

16 CHAIRMAN GRIFFON: Oh, is it on
17 that?

18 DR. TAULBEE: Yes, it's there.

19 CHAIRMAN GRIFFON: Okay. Well, if
20 we can't find it, you can help us find it.

21 DR. TAULBEE: Yes.

22 CHAIRMAN GRIFFON: Okay.

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1 MR. KATZ: Who has the access code
2 for the internet for the room? Anybody?

3 CHAIRMAN GRIFFON: I don't.

4 DR. TAULBEE: Jim just missed that
5 whole part about the review.

6 CHAIRMAN GRIFFON: That's all
7 right. We'll fill him in.

8 Okay. So I guess we can start
9 looking at the matrix now. I think everybody
10 has copies of the matrix.

11 Ted, did you make those available?
12 Were they available for the petitioner or --

13 MR. KATZ: I'm told that they are
14 on the website.

15 CHAIRMAN GRIFFON: Yes, I think I
16 saw them.

17 MR. KATZ: When I looked, I didn't
18 find them that night that you sent an email,
19 but I'm told they are there.

20 CHAIRMAN GRIFFON: Okay. So,
21 hopefully, they are.

22 This is a document, for those on

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1 the phone, we're working from a document
2 called Issues Matrix for the SRS SEC Petition
3 and Petition ER. There's plenty of acronyms
4 in there and it's dated September 9th, 2009
5 down in the bottom corner.

6 So, I know there's some people
7 representing the petitioner or who are
8 involved in the petition. If you don't have
9 copies, you know, let us know. We will try to
10 point you in the right spot to find the copy
11 of this document.

12 I believe it should be on the
13 website, right?

14 MR. KATZ: Yes, it is on the web.

15 CHAIRMAN GRIFFON: Okay.

16 DR. TAULBEE: Jim, just to fill
17 you in, one of the things that Arjun said
18 reminded me that this did undergo a review by
19 the independent panel of our non-qualification
20 of the production workers. And they concurred
21 with our class definition.

22 DR. MAKHIJANI: I didn't have any

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1 insider information. I was just asking for
2 the reference to Branche 2008, and that's what
3 it was.

4 DR. NETON: Okay, I got a hold of
5 LaVon. He's going to call in in a little bit
6 and refresh our memories as to what went into
7 the professional judgment decision and maybe
8 clarify the issues a little bit. When we hear
9 someone call in, that will probably be LaVon,
10 and we can maybe --

11 CHAIRMAN GRIFFON: Take a break
12 from wherever we are at.

13 DR. NETON: Get his feedback at
14 that point.

15 CHAIRMAN GRIFFON: Yes, yes, yes.
16 Okay.

17 So I guess, why don't we turn to
18 this matrix, if everybody has the copy? What
19 I would propose is just to go down these. I
20 think, since SC&A is the author, maybe you can
21 start off with the issue, and then we can have
22 a discussion with NIOSH.

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1 DR. MAKHIJANI: Sure.

2 CHAIRMAN GRIFFON: This is as much
3 to refresh our memories. I think, well, I'm
4 not sure that you are going to have -- well,
5 at least we can get status updates on where
6 things stand, yes.

7 DR. TAULBEE: Absolutely.

8 DR. MAKHIJANI: Yes, I'm Arjun
9 Makhijani.

10 We put this matrix together for
11 the SEC discussion. This is not just a
12 carryover from the site profile.

13 The way it was put together is
14 described in sort of the preliminary one-page
15 to this. We, of course, revisited the site
16 profile issues and screened them for whatever
17 might be relevant for the SEC, until resolved
18 by the Working Group.

19 We did a paper review without
20 actually doing interviews, a brief review at
21 the end of the last contract that SC&A had.
22 So we revisited that.

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1 Steve Marschke, who is on the
2 line, was the principal author of that review.

3 We had begun compiling some data
4 and looking at the claimant data compiled by
5 NIOSH. So some of that went into it, and
6 then, also, read the petition and some
7 associated documents and data. So this isn't
8 necessarily a complete matrix, but in
9 reviewing it in preparation for this meeting,
10 I think it is pretty complete. We may need a
11 couple of issues added on as we review it.
12 But I didn't find that there are giant, gaping
13 holes in this thing that we could fill.

14 So I think, if permitted, on that
15 basis, I think we may need to add an issue or
16 two as we get a little bit deeper in, but this
17 is, I felt, a good list to start with.

18 Should we start?

19 CHAIRMAN GRIFFON: Yes.

20 DR. MAKHIJANI: Okay. Our first
21 issue is regarding thorium pre-1960, which
22 that ball is in NIOSH's court. NIOSH said it

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1 is researching data. So we, essentially,
2 haven't done much work on it. Just note that
3 the issue is there, and NIOSH is going to put
4 some analysis or documents on the table to
5 address the issue.

6 MR. KATZ: Are we going to do
7 step-wise?

8 CHAIRMAN GRIFFON: Yes, yes.

9 DR. TAULBEE: Let me fill
10 everybody in on where we're at with this since
11 the Board meeting in December of 2008. The
12 week prior to the Board meeting, we went down
13 to Savannah River and we identified a group of
14 thorium workers from the 1950s. As we
15 captured their individual radiological
16 records, the goal was to look at their whole
17 body count information to see if we could come
18 up with a coworker model for this early time
19 period by bounding based upon their measured
20 data in the 1960s.

21 What we found is that the data was
22 rather lacking from the whole body count

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1 perspective. So we already had a data-capture
2 planned in January for neutrons. So we didn't
3 complete that particular data-capture.

4 So, when we returned in February,
5 we started looking for whole body count log
6 books at the Savannah River Site. That was
7 our keyword searches that were conducted,
8 again, in hopes of trying to collect a larger
9 population such that we could bound these
10 thorium doses.

11 And we weren't able to locate
12 those whole body count log books, either. So
13 we returned for one last try in March, not for
14 whole body count log books, but this time for
15 air sampling data, to see if we could bound
16 the doses based upon air sampling.

17 So we conducted a keyword search,
18 and we were able to locate 29 boxes of 300
19 area records, which is where they were
20 conducting the thorium work during this time
21 period. We had those boxes pulled, and we
22 went through and selected the air sample

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1 results, the special work permits, and the
2 radiation surveys, with regards to thorium
3 work in this time period.

4 Let me back up just a little bit
5 here on this particular issue. I know the
6 issues matrix says pre-1960 because that's
7 what we put in our evaluation report.

8 But we are really lumping this
9 particular work together from 1954 through
10 1965 because it was all metal work at that
11 time period. Post-1965 to 1971 was thorium
12 oxide.

13 So, because of the two different
14 materials that were being worked on, we kind
15 of lumped all of the metal work together going
16 up through 1965. We viewed these all together
17 as one issue.

18 It is important to recognize that
19 most of the canning work, which is what
20 Savannah River was doing, they were taking the
21 thorium slugs and putting them into a can and
22 welding them for irradiation in reactors.

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1 During this time period, most of the canning
2 was actually done at Sylvania. Now, I say
3 most, but not all. Early in 1954, there was a
4 process developed by Savannah River where they
5 were doing the canning there onsite.

6 But, in the 1960s, virtually all
7 of it was done at Sylvania. They would
8 receive a canned slug of thorium, and then
9 they would do acceptance testing. Some of the
10 acceptance testing involved autoclaving, which
11 is a high-pressure steam-washing test, and
12 some of them would fail. So there was some
13 potential for exposure to thorium during these
14 time periods. But we are lumping them
15 altogether at this particular time.

16 Now, from these air sample log
17 sheets and radiation survey log sheets, like I
18 said, we had requested 29 boxes to be pulled
19 in April. We conducted the review. The site
20 had difficulty locating about five of those
21 boxes. So we came back in May, and we
22 finished the review.

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1 Now one of the interesting parts
2 is one of the oldest boxes, 1954, was more
3 difficult to find. They still hadn't found it
4 as of May of 2009, but between the May data-
5 capture that we conducted and we had scheduled
6 one for July for neutrons as well, they were
7 able to locate those remaining two boxes, and
8 we were able to review them in July.

9 Unfortunately, we didn't receive
10 this data until November of 2009, which was
11 just a few months ago. But, since we have
12 received it, we have developed a coworker
13 model or a model to evaluate the exposures to
14 thorium.

15 However, in December, when we went
16 through the review of this particular
17 document, we found some concerns due to a
18 minimum amount of data that was relied upon in
19 the report. Now we do have more data. So
20 what we have asked our contractors to do is to
21 go back and to code more of this data. The
22 current scheduled completion for that will be

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1 February, February 5th, two weeks from now,
2 when that data is supposed to be completed.

3 So we hope to update the model at
4 that time, and then get it through review and
5 present it here to the Work Group and to SC&A
6 for their review.

7 So that covers the thorium metal
8 work.

9 Are there any questions?

10 DR. MAKHIJANI: Yes. Do you have
11 any segregation of this data by construction
12 and non-construction workers?

13 DR. TAULBEE: Yes and no. And how
14 I can best answer that is when you consider
15 the -- the air sample log sheets are
16 indiscriminatory. I mean they just cover an
17 area at a particular time.

18 Occasionally, some of them will
19 mention lathing on thorium and the air sample
20 was taken two foot from the lathe, type of
21 scenarios. So we have some of that data.

22 When we get into the 1970s or the

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1 early 1970s with the thorium oxide work, we
2 have the air sample data and radiation survey
3 log sheets during the decommissioning, which
4 was conducted by the construction trades
5 workers. So it is spelled out in these
6 particular --

7 DR. MAKHIJANI: Can you say that
8 again? I didn't understand that.

9 DR. TAULBEE: At the end of the
10 thorium work in the 1970s, the decommissioning
11 of that particular facility, taking it apart,
12 that was conducted by the construction trades
13 workers, and it is specified on the radiation
14 survey log sheets and the air samples that are
15 conducted at the same time that these were
16 taken during that phase. So that would be
17 specific for construction trades workers.

18 DR. MAKHIJANI: Okay. The reason
19 I bring this up is, you know, when we were
20 there, when you were doing the document review
21 and we did some interviews a year --

22 DR. TAULBEE: January of last

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1 year.

2 DR. MAKHIJANI: Yes. Construction
3 workers said that, you know, that they did
4 similar jobs to non-construction workers. It
5 was apparently some peculiarity of the
6 Savannah River Site. They would get called in
7 and that they often got to do the dirtiest
8 work. So, even if they didn't do it 40 hours
9 a day, they claimed that they had more
10 exposure potential. And this is going to come
11 up repeatedly. So I am just putting it on the
12 table.

13 When we looked, compared the
14 construction worker and non-construction
15 worker data by job type and by area and
16 decade, not by year as you do, just to get
17 sufficient data to look at it, we found that
18 in many cases, by job type areas, this concern
19 was validated by the data, and you couldn't
20 just assume, as the evaluation report does,
21 that non-construction worker data, which are
22 more plentiful, would bound the construction

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1 workers generally -- or by job type.
2 Sometimes it does and sometimes it doesn't.

3 DR. TAULBEE: Do you have that
4 analysis written up that we --

5 DR. MAKHIJANI: Unfortunately, due
6 to a logistical mixup, I was going to send
7 that to you, I had hoped to send that to you a
8 week before this meeting, but we had a little
9 bit of a logistical mixup in SC&A. So it is
10 still at DOE for review, unfortunately. You
11 will get it very soon.

12 DR. TAULBEE: Okay.

13 DR. MAKHIJANI: And it is
14 complete. So I can tell you the bottom line
15 of what is in it.

16 We didn't look at all
17 radionuclides and so on, but what we did a
18 pretty wide analysis without being exhaustive.

19 This showed a pretty consistent result.

20 Harry Chmelynski, our
21 statistician, and Steve Marschke did the
22 compilation of the data.

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1 DR. NETON: Arjun, was this for
2 both internal and external?

3 DR. MAKHIJANI: Internal only.

4 DR. NETON: Internal only.

5 DR. MAKHIJANI: Internal only.
6 That's why I'm bringing it up, is this is
7 going to be kind of a theme running through
8 all of the internal dose items, basically. So
9 it will also be that you run into this, except
10 for the 70s data.

11 DR. NETON: Now what you are
12 saying, though, is the monitored construction
13 workers were more heavily exposed than the
14 regular workers.

15 DR. MAKHIJANI: In some cases and
16 some job types.

17 DR. NETON: So what I'm saying is,
18 you don't really know that the unmonitored
19 construction workers were more heavily
20 exposed. I guess that's always been the
21 question on the table, is, if you had evidence
22 that monitored workers were exposed more

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1 heavily, then they have monitoring data;
2 therefore, we should be able to reconstruct
3 that.

4 But your inference is that,
5 therefore, unmonitored workers were as heavily
6 exposed as the monitored workers?

7 DR. MAKHIJANI: Well, we don't
8 mean any explicit inference. There are two
9 things about that.

10 When we looked at it, since you
11 have compiled all the claimant data, and
12 that's the only data available in electronic
13 form for analysis, unless we go to the Nevada
14 Test Site group, which is very expensive and
15 cumbersome, which we haven't done as yet, we
16 found there wasn't enough construction worker
17 data in a lot of periods and categories,
18 actually, to be able to say, less than ten
19 samples in a whole decade.

20 Once you parse it by area --

21 DR. TAULBEE: Really?

22 DR. MAKHIJANI: Yes, really. Once

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1 you parse it by area -- Steve Marschke, who
2 compiled the data, is on the line. He knows
3 the data better than I do, and I will let him
4 confirm.

5 MR. MARSCHKE: Can you hear me?
6 Arjun, can you hear me?

7 DR. MAKHIJANI: Yes. Yes.

8 MR. MARSCHKE: Can you hear me?

9 MR. KATZ: Yes. Go ahead, Steve.

10 MR. MARSCHKE: Yes, what Arjun
11 said is true. What we did was we downloaded
12 the files from the O: drive and we tried to
13 parse them by various ways. First, we looked
14 at them by area and by decade.

15 We looked at both the non-
16 construction workers and the construction
17 workers. For non-construction workers, if we
18 had more than 100 samples for a particular
19 radionuclide -- we looked at tritium, we
20 looked at plutonium, we looked at uranium, and
21 we looked at fission products, because the
22 other radionuclides -- we just looked at the

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1 samples, at the databases, and we didn't think
2 we had enough sample points to really do any
3 kind of meaningful analysis on them. So we
4 just looked at those groups of radionuclides.

5 When we had more than 100 samples
6 for non-construction workers, then we did an
7 analysis. We did a geometric mean and we did
8 a 50th percentile and an 84th percentile
9 calculation, using Excel's percentile
10 function.

11 For construction workers, we did a
12 similar thing, but because there were so few
13 samples, we reduced our limit to just 10
14 samples. If we had 10 samples, then we did
15 the analysis. If we had fewer than 10, then
16 we did not do any analysis.

17 So, as Arjun says, there are some
18 decades and some areas where we did not have a
19 total of 10 samples --

20 DR. MARSCHKE: In the whole
21 database?

22 MR. MARSCHKE: -- in the claimant

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1 database.

2 DR. MARSCHKE: Okay.

3 DR. MAKHIJANI: In the claimant
4 database. So now we are not saying that the
5 data don't exist at this stage. You know, it
6 is sort of we're saying that, in many cases,
7 you don't have enough construction -- although
8 the evaluation report says that internal
9 monitoring data for the vast majority of
10 construction workers, this internal monitoring
11 data, when you try to see whether there's
12 relevant monitoring data to reconstruct the
13 various aspects of dose, tritium, plutonium,
14 uranium, and to do it by decade even, not by
15 year, you don't have data enough in many
16 categories. So you can't even do a
17 comparison. So that is sort of one point.

18 The other point in regard to non-
19 monitored versus monitored workers, you know,
20 you have had this discussion many times, I
21 think starting with Y-12, both for external
22 and internal, here it is just internal, and

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1 most recently at NTS, where the statement was
2 made that monitored workers would be the most
3 exposed or among the most exposed. Then it
4 turned out that the evidence is that that is
5 probably not the case.

6 So our analysis, you will see in
7 our report, is we have no definitive
8 conclusion about it, but there is some
9 evidence that that's not uniformly the case
10 anyway for NTS.

11 So, just if I might finish, I
12 think to say that monitored workers had the
13 most exposure potential and can be used for
14 bounding dose, I think, at least from our
15 experience and past analyses, can't be
16 accepted without some qualitative
17 demonstration.

18 DR. TAULBEE: If I could interject
19 here, one of the things that is unique about
20 Savannah River is that 80 percent of the
21 claimants from the Savannah River Site have
22 external and internal monitoring data here.

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1 So, if you look at the entire population that
2 have filed claims -- they are in our NOCTS
3 database -- 80 percent of them, we have
4 external and internal monitoring information.

5 So I guess I disagree with you at
6 this point. Now there could be evidence that
7 you point to me that changes my mind, that the
8 people that we have in NOCTS are the more
9 highly exposed, those that have the monitoring
10 data.

11 The other thing I would like to
12 point out is that we do have the full bioassay
13 records from the site. It is not all
14 electronic, as you pointed out, and it is not
15 all in NOCTS, but we have captured all of the
16 bioassay log books for uranium, plutonium,
17 fission products.

18 We have found, as you did, that in
19 NOCTS, in some cases we don't have sufficient
20 positive samples in the development of the
21 coworker models. In one particular case,
22 uranium, for the very earliest years, we have

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1 undertaken an effort to go back and code all
2 of the uranium data.

3 So you're correct, where you are
4 looking at a time period where we don't have
5 or there isn't a large amount of data in order
6 to draw a conclusion, we recognize that as
7 well, and we've gone back and we've started
8 coding more of that data in order to conduct
9 the analysis.

10 So I think those are important
11 things to keep in mind.

12 DR. MAKHIJANI: Yes.

13 CHAIRMAN GRIFFON: We can get more
14 specific on the discussion once we have the
15 report.

16 DR. TAULBEE: Yes, we need to get
17 the report, sure.

18 DR. MAKHIJANI: Yes. You will
19 see, and we need to provide you with the
20 details of the analysis. If the Working Group
21 authorizes us to essentially prepare a full
22 review, we will just give you all of the

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1 analysis and data in a spreadsheet.

2 CHAIRMAN GRIFFON: Well, your
3 report is that, right?

4 DR. MAKHIJANI: The report is
5 that, but the underlying spreadsheets are not
6 attached to it.

7 CHAIRMAN GRIFFON: Okay. Well,
8 assume we'll ask for those.

9 DR. MAKHIJANI: Yes, right.

10 So, Steve, are the underlying
11 spreadsheets -- I'll call Harry at the break
12 and have him on, too.

13 Are the underlying spreadsheets in
14 a condition that we could put them up for
15 review as soon as the report is done, so that
16 NIOSH can review the spreadsheets as well?

17 MR. MARSCHKE: Well, there are two
18 problems there, Arjun. One is the size of the
19 spreadsheets because, basically, we started
20 with, particularly for the non-construction
21 workers, the spreadsheets are very large.

22 DR. MAKHIJANI: Right.

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1 MR. MARSCHKE: We are talking
2 maybe greater than 50 megabytes, maybe closer
3 to 100 megabytes in size. So there is just a
4 transmittal problem with them, and we have to
5 get them up on the O: drive someplace, I
6 guess, where they could be available.

7 DR. MAKHIJANI: Yes, yes.

8 MR. MARSCHKE: Then the other
9 problem is somebody would have to try to
10 decode or try to figure out how I went about
11 coding them.

12 DR. MAKHIJANI: Oh, okay. So
13 that's a different problem.

14 MR. MARSCHKE: I mean the
15 information is all there. Maybe we need a
16 road map to give to NIOSH and the Board
17 members or the Work Group members, so that
18 they can try to follow my logic because my
19 logic doesn't always agree with everybody
20 else's logic.

21 (Laughter.)

22 DR. MAKHIJANI: Okay.

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1 CHAIRMAN GRIFFON: I would suggest
2 that you had better clean them up before you
3 post them.

4 DR. MAKHIJANI: Yes, we will. The
5 report stands on its own. I've looked at the
6 data also independently, and I think the
7 report will make sense to you on its own. But
8 we will clean up the spreadsheets.

9 Steve, could you do me a favor and
10 call Harry and ask him to get on the line,
11 too?

12 MR. MARSCHKE: Okay.

13 DR. MAKHIJANI: Thanks a lot.

14 CHAIRMAN GRIFFON: All right, and
15 I'm going to go back to our original
16 conversation. I think you were considering --

17 DR. MAURO: Mark, this is John
18 Mauro.

19 CHAIRMAN GRIFFON: John, good
20 morning.

21 DR. MAURO: Good morning, yes.

22 CHAIRMAN GRIFFON: How about those

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1 Jets, huh?

2 DR. MAURO: I have one question.
3 It is fundamental, and it is important because
4 it is overarching.

5 We gave you sort of like a preview
6 of the report that is coming, but there's a
7 concept in here that Jim just mentioned
8 something, and I just want to make sure I
9 understand.

10 Let's imagine that it's the 1970s.
11 We're looking at that decade, and we're
12 looking at bioassay samples for fission
13 products. Okay? And let's say we've got a
14 large number of samples from workers that we
15 call construction workers, and we can make a
16 nice distribution and it's a nice log-normal
17 distribution.

18 And let's say we've got a large
19 number of bioassay samples from people that we
20 call non-construction workers. Okay? So
21 we've got these two distributions.

22 We find that, picture these two

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1 log-normal curves in your mind, and they don't
2 overlap. In other words, the median and the
3 95th percentile, or the 1 sigma, is
4 substantively different, factors of two-,
5 three-, four-, five-fold difference shift over
6 to one side.

7 Now, if that difference exists
8 amongst the monitored -- and here's where my
9 question comes in, and it is really generic --
10 if that difference exists and it is real, we
11 would draw the conclusion that there is
12 something different about these two
13 populations of workers and the way in which
14 they were exposed.

15 So, therefore, if you are going to
16 build a coworker model to apply to, let's say,
17 construction workers or to regular workers,
18 you must take that difference into
19 consideration because it appears that it may
20 have a substantive difference.

21 But Jim said something important,
22 and that is that may not necessarily be the

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1 case, and that that kind of comparison has to
2 be viewed with a degree of skepticism on what
3 it really means. That does go to the heart of
4 how we go about doing our work everywhere,
5 including here on the Savannah River
6 investigation that you will be looking at.

7 So I guess I would like to hear a
8 little bit whether or not that type of
9 comparison that I just described, where the
10 outcome shows that one group, construction
11 workers, 1970s, fission products, has a
12 distribution that is clearly and unambiguously
13 different than another group.

14 I find it very compelling that, in
15 fact, they are different. I just want to make
16 sure that the Work Group and that NIOSH would
17 agree if that were to happen.

18 DR. NETON: Well, I can speak for
19 at least my opinion on this. There is a
20 precedent that has been set with TIB-0052
21 where we compare monitored construction
22 workers versus production workers, and where

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1 we saw differences, we ended up doing exactly
2 what you were proposing, which is we created a
3 multiplier.

4 DR. MAURO: Yes.

5 DR. NETON: And I believe that was
6 for some external exposed workers as well as,
7 I think, internal-exposed workers at Hanford,
8 or something to that effect.

9 DR. MAURO: I remember its being
10 external. I don't remember --

11 DR. NETON: And I think Hanford
12 had one internal piece. We need to go back
13 and look at all the data because we did this
14 sort of similar comparison for construction
15 workers at Savannah River, I thought.

16 DR. TAULBEE: That is correct.
17 Mel's team went down there and looked at this
18 specifically for plutonium, which is what I am
19 eager to see your analysis of what it is that
20 you looked at. Because I know Mel went down
21 and collected construction worker trades and
22 production worker trades for plutonium and did

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1 a comparison, and he didn't see any difference
2 between the two.

3 That's why I'm --

4 DR. NETON: And I'm sure there may
5 be differences in the way they were analyzed
6 and aggregated and such, but, in principle, I
7 think, John, you're right. If there are
8 differences in those distributions, one has to
9 acknowledge that and take it into account.

10 However, also, I would like to
11 back up a little bit to something that Arjun
12 said earlier about the NTS, where it was
13 demonstrated that the highest-exposed workers
14 weren't monitored. I think there's a slight
15 difference of opinion there.

16 I think we couldn't demonstrate
17 that the highest-exposed workers were
18 monitored, and that is a subtle difference,
19 but important. Because, at NTS, we ended up
20 at the end of the day not being able to find
21 records that document that the right workers
22 were actually monitored. That is what ended

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1 up creating that class.

2 That whole analysis would have to
3 occur at Savannah River in parallel to make
4 that determination.

5 DR. MAURO: Jim, the only reason I
6 brought the question up is you had mentioned
7 earlier that there was something about, well,
8 if you are only looking at monitored workers,
9 and you are going to then apply that to
10 unmonitored workers, somehow you can't do that
11 because of, I guess, a built-in bias because
12 you are only looking at the people that were
13 monitored for making these comparisons.

14 Or maybe I misunderstood what you
15 were saying.

16 DR. NETON: Well, no, but I also
17 would say that one needs to still look at it
18 and see what those differences are. Well, I
19 don't know. I would like to look at the
20 distributions that were generated.

21 DR. MAURO: Okay, but I appreciate
22 your -- I wanted to make sure that this got on

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1 the table because it does go to the heart of
2 everything we do.

3 DR. NETON: Right.

4 DR. MAURO: Okay. Thank you.

5 DR. MAKHIJANI: Could I ask him a
6 question?

7 Is the statement you made about
8 Mel Chew looking at the data the statement
9 that you've made in the ER --

10 DR. TAULBEE: That's correct.

11 DR. MAKHIJANI: -- about
12 plutonium?

13 As I read the statement in the ER,
14 it was a general statement about the complex
15 and not about SRS. I'm trying to find the
16 statement, that you found that plutonium for
17 non-construction workers was generally
18 comparable to a higher-than-something than for
19 construction workers. But there's no site-
20 specific Savannah River statement in the
21 evaluation report.

22 DR. TAULBEE: But there is in

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1 TIB-0052.

2 Mel, are you on the line?

3 DR. MAKHIJANI: The analysis for
4 the Savannah River Site on internal dose for
5 these radionuclides is in TIB-0052.

6 MR. CHEW: I'm on the line.

7 It was site-specific for Savannah
8 River, yes.

9 DR. NETON: There was a Savannah
10 River --

11 MR. CHEW: Yes.

12 DR. NETON: Could you say that
13 again, Mel, please?

14 MR. CHEW: I said, yes, there was
15 a site-specific for Savannah River for
16 internal exposures, yes.

17 DR. MAKHIJANI: Okay. For
18 construction workers?

19 DR. NETON: Yes, TIB-0052. It's
20 in TIB-0052,

21 MR. CHEW: Yes, it is.

22 DR. MAKHIJANI: Steve is on the

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1 line. He is our TIB-0052 man.

2 Have we looked at the Savannah
3 River Site internal plutonium data in
4 TIB-0052? I don't recall that we did.

5 DR. NETON: Well, there certainly
6 was a review of TIB-0052, and Steve, if I
7 recall, was the lead on that.

8 DR. MAKHIJANI: Yes, he was. I
9 worked with him, but Steve was the lead.

10 DR. MAURO: This is John.

11 I recall, when I read our review
12 of TIB-0052, what sticks in mind is that the
13 adjustments dealing with external for the
14 difference between construction workers and
15 non-construction workers, that was the main
16 story that was told, and it was based on
17 looking at data that were available from a
18 number of sites. Some of those sites had more
19 data than others.

20 But I have to say my recollection
21 of internal was that there was no basis for
22 the adjustment factor for internal.

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1 DR. NETON: That is correct.

2 DR. MAURO: That was like a broad,
3 general recollection of the outcome, the 30-
4 second soundbite.

5 I don't remember there being any
6 specific consideration of internal for
7 particular sites, such as Hanford.

8 DR. NETON: Oh, there was. There
9 was --

10 DR. MAURO: Okay, I might be
11 wrong.

12 DR. NETON: Hanford had an
13 adjustment factor, but for the few sites that
14 we were able to collect sufficient data -- and
15 I believe Savannah River was one of them --
16 Savannah River, Rocky Flats I think, Hanford,
17 and I forget. But Savannah River is one of
18 the ones that we did evaluate for internal
19 exposures.

20 We, at least in the analysis with
21 TIB-0052, did not find sufficient difference
22 to indicate that construction workers --

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1 monitored construction workers were more
2 heavily exposed than production workers.

3 DR. MAKHIJANI: Is your SRS
4 analysis on the O: drive so we can see it? I
5 mean, you will soon get ours.

6 DR. NETON: TIB-0052 is available.

7 DR. TAULBEE: That is where this
8 analysis is.

9 DR. MAKHIJANI: John, can you find
10 Steve?

11 CHAIRMAN GRIFFON: Yes, he can
12 follow up on that. Okay.

13 MEMBER CLAWSON: Mark, this is
14 Brad.

15 I would just like to make one
16 comment. The Savannah River is different than
17 every other site we have had out there. Where
18 the operations personnel were not represented,
19 the boundaries were very -- and this came out
20 in a lot of the interviews, and so forth, like
21 that -- but a lot of times, production workers
22 would not go in and do the work, or whatever,

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1 because their dose they were trying to keep as
2 low as possible for other events.

3 So they would bring construction
4 workers in, burn them out, ship them out.
5 There was a calculated reason to try to keep
6 the production workers as low as they could.

7 We saw this numerous times in the
8 interviews, and so forth like that. One of
9 the foremen that came in and interviewed with
10 us, too, made the same comment because a lot
11 of times the production workers, they would
12 need them, and they couldn't afford to get
13 them overexposed.

14 So it is going to be interesting
15 to see how this comes out because this
16 Savannah River Site is different and set up
17 different than any other site that we have
18 got.

19 CHAIRMAN GRIFFON: Yes, and I'm
20 curious of some of the details, too. I mean,
21 for instance, a very simple question, but
22 probably relevant to this discussion I think

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1 is how you identify construction and trades
2 versus non.

3 I mean what I have heard from
4 people that work down there on research stuff,
5 the CPWR folks, indicating that a lot of --
6 there was that overlap with maintenance that
7 was --

8 MEMBER CLAWSON: Very much so.

9 CHAIRMAN GRIFFON: -- often
10 encountered, and they might have had similar
11 job titles, but one was considered on the
12 operational side and one was considered on the
13 trade side.

14 So I'm curious how you -- but I
15 think we need to see the analysis. We can
16 talk hypothetically forever here. So I would
17 rather wait for the analysis.

18 MEMBER CLAWSON: Right. Well,
19 this was one of my questions, is how we were
20 going to discern between them because a lot of
21 times in the projects they were intertwined so
22 much. And one of my questions was how did

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1 they distinguish, and it wasn't -- they were
2 just all on the same work procedure, and so
3 forth.

4 DR. TAULBEE: How we can
5 distinguish them, and you're right, they did
6 work on the same work procedures, the same
7 work permits, and you'll see the sign-in
8 sheets going down, and some are construction
9 trades and some are operators.

10 How we identify them is through
11 the dosimetry code, their payroll ID.
12 Savannah River had a unique system of; Row 1
13 was the salaried workers, Row 2 were the
14 regular operators, Row 3 were Wilmington
15 salaried, folks that came down from Delaware,
16 Row 4 were construction workers.

17 All the construction trades
18 workers had a two-digit prefix in front of
19 their payroll ID that identifies their trade.

20 So, at Savannah River, we can identify
21 pipefitters from electricians from general
22 laborers. So that is how we identify who are

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1 construction trades and who are the operators.

2 But you're absolutely right, on a
3 particular job, if you look at the sign-in
4 rosters, you will see pipefitters signing in
5 right next to regular operators. But, from
6 the dosimetry codes, we can see which trade
7 they were.

8 MEMBER CLAWSON: So you would be
9 able to tell the difference between a
10 construction pipefitter versus a Savannah
11 River pipefitter?

12 DR. TAULBEE: A Savannah River
13 operator.

14 MEMBER CLAWSON: Well, they had
15 some maintenance people. This is what we were
16 getting into. They had some roving
17 maintenance people that did this that were not
18 a part of the trades, but they were still like
19 pipefitters, electricians, and so forth, like
20 that, but were actually Savannah River
21 workers.

22 This is where my being able to

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1 separate kind of becomes a little bit
2 interesting, too, because they had a set
3 maintenance force that did maintenance work.
4 Now, when construction came in, this is where
5 it overblends a little bit.

6 DR. TAULBEE: Okay. Let me ask
7 you this then: you are talking about the
8 construction workers who were brought in, so
9 that they could save the dose on other
10 individuals?

11 MEMBER CLAWSON: Yes, in some
12 aspects --

13 DR. TAULBEE: The people they
14 would be wanting to save the dose would be the
15 regular operations maintenance type of
16 personnel, right? So the Row 4 people is who
17 they would be bringing in on a short-term
18 basis.

19 So, ideally, the hypothesis is
20 testable of looking at the Row 4 versus these
21 operations people, who they were wanting to
22 try and save the dose. They might both be

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1 pipefitters, as you're talking about, but one
2 of them, the Row 4 folks, should, in fact, be
3 having a higher dose then.

4 DR. MAKHIJANI: Well, we have
5 actually tested, that's what I said, we've
6 actually tested this to some extent, and you
7 find that, at least for internal doses, and
8 you'll find it for external dose, too, because
9 you have an adjustment factor of more than one
10 for the Savannah River Site, that in some
11 cases, some years, some job categories, you
12 will find marked differences. In other cases,
13 of course, construction workers are lower.
14 It's all over the map, actually.

15 DR. NETON: I was just going to
16 point out I'm looking at, this is right on,
17 you can get right to this from our OCAS
18 website. TIB-0052 is out there. Section 5.2
19 does the SRS internal dose comparison, where
20 we looked at 1830 plutonium urine
21 measurements, one-third of which were
22 represented by construction workers. There's

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1 a graph there that compares the values.

2 Our conclusion was that, in
3 general, the non-construction work or
4 production-type workers had higher positive
5 plutonium in urine than the construction
6 trades workers.

7 So we need to look at both of
8 these reports.

9 DR. MAKHIJANI: We need to look at
10 them side by side.

11 CHAIRMAN GRIFFON: Right, right.

12 DR. MAKHIJANI: In some
13 specialized ways, they might all be true.

14 (Laughter.)

15 DR. NETON: Exactly. I mean, if
16 you slice the salami so thin, you can get just
17 about whatever you want.

18 CHAIRMAN GRIFFON: Okay. So I
19 think we left off on --

20 DR. TAULBEE: Issue one.

21 CHAIRMAN GRIFFON: -- you were
22 talking about thorium oxide, right after 65,

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1 yes.

2 DR. TAULBEE: Okay, let me
3 complete up here a little bit on the thorium
4 oxide.

5 Now the thorium oxide work was --

6 DR. NETON: Bomber is on the
7 phone. Bomber is on the phone, and he has
8 patiently been waiting to tie him in here.
9 So, before we move on, maybe if he's still
10 there, he could give us a brief summary of
11 what he knows about the compilation of the
12 class.

13 LaVon, are you on?

14 MR. RUTHERFORD: Yes, I'm on.
15 This is LaVon Rutherford.

16 I guess there's questions on what
17 we qualified and what we evaluated. We
18 qualified, during the time, at the time when
19 we were looking at it, the construction
20 workforce was the only area at that time where
21 we saw that there may have been gaps that
22 would support qualification. So that is what

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1 we qualified. But our evaluation pretty much
2 covers everyone.

3 (Laughter.)

4 Let me explain. Let me explain.
5 It covers everyone because what we determined,
6 since the construction workforce was all over
7 the place, we needed to understand the actual
8 monitoring for all the workforce and be able
9 to use that data to bound our construction
10 workers when necessary.

11 CHAIRMAN GRIFFON: So. Yes, I
12 mean, I go back to my point, which was, from a
13 practical standpoint, it seems like we are
14 going to be doing that anyway.

15 MR. RUTHERFORD: Yes.

16 CHAIRMAN GRIFFON: But I'm a
17 little concerned that, at the end of the Work
18 Group, we can't speak to the production
19 workers. You know what I mean? We can't
20 answer that question because we're not allowed
21 to. We're only focused on the qualified
22 petition --

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1 MR. RUTHERFORD: No, I think
2 that's wrong. I think that, Mark, if at any
3 time at the end of the day if we determine
4 there's an infeasibility, even if the Work
5 Group determines there's an infeasibility, we
6 have to put boundaries around that
7 infeasibility. Whether that goes beyond the
8 class evaluated, you know, the actual proposed
9 class, I think that, as long as we have looked
10 at all the parameters and we have to put
11 boundaries around it, we can go beyond that.
12 We've done that before.

13 CHAIRMAN GRIFFON: Okay. I just
14 want to make sure that we, as a Work Group or
15 the Board, are not going out of our scope of
16 allowed work here, you know.

17 MR. RUTHERFORD: I don't believe
18 so. I'm sure OGC's online, if they will pipe
19 in. But I know that we have done this
20 routinely.

21 I mean part of our evaluation
22 process, typically, we may qualify a petition

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1 for a given time period based on what was
2 presented to us initially, but after further
3 evaluation, in the process we may determine
4 there's an infeasibility and may actually go
5 beyond what was presented to us to try to put
6 boundaries around that infeasibility.

7 CHAIRMAN GRIFFON: That's NIOSH
8 widening the scope, though, yes.

9 MR. RUTHERFORD: Yes, but I
10 don't --

11 CHAIRMAN GRIFFON: Yes, yes.

12 MR. RUTHERFORD: To me, I don't
13 really see that any different if, ultimately,
14 during the Work Group evaluation, it is
15 identified that -- I'm just saying that this
16 happens, and I'm saying that if the Work Group
17 identifies an infeasibility and, ultimately,
18 we can't resolve that infeasibility, whether
19 we have to present an addendum or we have to
20 do something, I don't see that as a problem
21 myself.

22 MS. HOWELL: I think Bomber is

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1 correct; there is a slight distinction to be
2 made. The Board can, in evaluating the SEC
3 petition before it, which is the petition that
4 qualified, the Board can consider the
5 additional information that perhaps is not
6 addressed in the petition or the initial NIOSH
7 evaluation report.

8 Then the Board can recommend that
9 NIOSH conduct further evaluation and report
10 those findings to the Board, and the
11 petitioners and NIOSH may at that point decide
12 to, as Bomber said -- I'm sorry -- LaVon has
13 said, amend that class.

14 So the slight distinction is that
15 the Board and the Working Group cannot direct
16 the enlargement or amendment of a class, but
17 you can direct NIOSH to look into these issues
18 and to say that you see these are concerns.

19 Now there are some concerns with,
20 you know, if the majority of the work that you
21 are doing within the Working Group and
22 directing SC&A to do is outside of the

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1 petition that qualified, that might create
2 some other concerns. But, you know, as part
3 of that --

4 CHAIRMAN GRIFFON: I guess that's
5 what I'm getting at, is, you know, as we're
6 going forward and starting to task SC&A to
7 work with us on this, then, if it is being
8 perceived as being out of scope of what I'm
9 allowed to be reviewing --

10 MS. HOWELL: I mean it sounded
11 like, from what Jim and Arjun were saying
12 before, that these are issues in tandem.

13 CHAIRMAN GRIFFON: I think so.
14 That's why I'm just trying to get a
15 clarification really.

16 DR. MAKHIJANI: As LaVon said, you
17 know, they evaluated all data.

18 MR. RUTHERFORD: I think if you
19 look at how we approached our feasibility
20 determination for the construction workers, it
21 was to look at all workers. So I think that
22 that opens up the door for everything.

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1 MS. HOWELL: And so I would put
2 the qualifier on this, that in this case,
3 because of how NIOSH evaluated Savannah River,
4 you may have a little bit more leeway in terms
5 of how you direct your support, your technical
6 support contractor to look at things, but
7 that's not necessarily the case with every SEC
8 evaluation.

9 CHAIRMAN GRIFFON: Right, right,
10 right. And the only reason I'm asking this --
11 maybe it seems obvious to all of us -- but I
12 just wanted a clarification before we get too
13 far along here, and someone says, why are you
14 doing this review of 30 production workers?
15 This is a construction worker, you know.

16 So, anyway, I just wanted to get
17 it upfront, but I think we're all on the same
18 page now that we can consider that
19 information. Then we would have to officially
20 ask NIOSH to assess whether they want to
21 broaden it, or whatever, if that comes up, if
22 it comes to that. But we can consider the

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1 direction stuff in tandem now. I think that
2 makes sense from a practical standpoint, too.

3 All right.

4 DR. TAULBEE: And Bomber is right.

5 CHAIRMAN GRIFFON: Yes.

6 DR. TAULBEE: I mean we had looked
7 at production workers as well as the
8 construction trades, so that we could compare
9 the two different groups, during our
10 evaluation report.

11 CHAIRMAN GRIFFON: Yes. Okay.

12 Thanks, LaVon.

13 MR. RUTHERFORD: All right. I
14 will keep my Blackberry and eye on the emails
15 about getting back on. Unfortunately, I have
16 conflicting meetings right now.

17 CHAIRMAN GRIFFON: No, that is
18 okay. I appreciate your getting on, Bomber.

19 DR. TAULBEE: Thanks, Bomber.

20 MR. RUTHERFORD: All right. We'll
21 see you.

22 CHAIRMAN GRIFFON: So I think

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1 we're okay to go back to thorium oxide. Okay,
2 yes.

3 DR. TAULBEE: And thorium is a
4 prime example of this one, in particular.

5 CHAIRMAN GRIFFON: Yes, yes.

6 DR. TAULBEE: The petitioners
7 didn't bring up thorium, but we knew that
8 thorium was an issue at other sites. So we
9 started looking at it at Savannah River on our
10 own.

11 DR. MAKHIJANI: Yes, and I think
12 we've covered -- because this thing will
13 repeat itself.

14 CHAIRMAN GRIFFON: Yes, we don't
15 have to repeat that discussion all the time,
16 please.

17 (Laughter.)

18 DR. TAULBEE: The thorium oxide
19 work, the time period we've kind of labeled
20 this as is 1965 to 1971, and these are the
21 production years for this. There was some
22 experimental work early on, on the canyon side

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1 that was conducted prior to 1965, 63/64 time
2 period. But 1965 is when the big production
3 of thorium oxide work was conducted.

4 In this particular case, the work
5 was conducted there at Savannah River, and it
6 was conducted in a HEPA-enclosed filtered
7 glove box, if you will, within the 300 area.
8 We have been working on a report for this. We
9 have obtained some photos of this particular
10 enclosure, so that you guys can view the
11 particular operations that were going on.

12 In 1971, it was when the facility
13 was taken apart, and this was done by
14 construction trades workers there at the site.

15 We have radiation surveys and air sample data
16 during this time period.

17 Our report is nearly complete. In
18 fact, this one was going to be coming out
19 ahead of the prior time period, which is where
20 we still have the open issue on the SEC. So
21 we diverted some resources from that to go
22 back and let's get the first early time period

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1 out before we get this report out.

2 So I really expect that both the
3 thorium metal work from 54 to 65 and the
4 thorium oxide work from 65 to 71, those two
5 reports should come out almost simultaneously.

6 I'm predicting right now that that would be
7 in early March. At least that is what the
8 Gantt chart indicates to us at this time.

9 CHAIRMAN GRIFFON: So the
10 contractor, February, and then your review,
11 and about March we will be able to see it?

12 DR. TAULBEE: That is correct,
13 yes.

14 MR. KATZ: That includes the DOE
15 review?

16 DR. TAULBEE: That includes the
17 DOE review.

18 CHAIRMAN GRIFFON: All right.

19 DR. TAULBEE: That is where it is
20 on the Gantt chart right now, barring any --

21 CHAIRMAN GRIFFON: Can I? This is
22 just for my clarification. I think you

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1 already said this. But, in item 2, I think
2 we're doing 1 and 2 simultaneously here.

3 DR. TAULBEE: We are. Sorry.

4 CHAIRMAN GRIFFON: But, in item 2,
5 it does indicate reliance in vivo after 60,
6 but you found that it is going to be more of
7 the air sampling?

8 DR. TAULBEE: It is. That is
9 correct. It is going to be more of the air
10 sampling during that time period.

11 CHAIRMAN GRIFFON: Okay. I'm
12 sorry. So that, basically, is sort of a
13 modification from your original position that
14 it is mainly air sampling --

15 DR. TAULBEE: That is correct.
16 That is correct.

17 DR. MAKHIJANI: Are there any in
18 vivo data for construction workers? Because I
19 didn't find any in the claimant data.

20 DR. TAULBEE: Yes.

21 DR. MAKHIJANI: There are? Maybe
22 I was not looking at the right spreadsheet. I

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1 checked briefly before this meeting. I
2 haven't talked to Steve about it.

3 DR. TAULBEE: I'm not sure from
4 the 300 area. There should be. I'm 99
5 percent sure.

6 DR. MAKHIJANI: Okay.

7 DR. TAULBEE: The reason that we
8 went with the air sample data in this latter
9 time period is that we have got indications
10 that people were whole body counted for
11 thorium, and this is in the works, monthly
12 works technical reports. There are written
13 statements in there of 13 people counted this
14 month for thorium oxide exposure in the whole
15 body counter; no assimilations detected.

16 We have not been able to identify
17 those 13 people counted in a particular month
18 because we haven't found those whole body
19 count log books to go back and pull those
20 particular records. This is why we have
21 switched and gone to the air sample data
22 during this particular time period.

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1 CHAIRMAN GRIFFON: And again, that
2 was 65 to 71? Post-71, do you have in vivo
3 for thorium? Post-71, do you have full body
4 count?

5 DR. TAULBEE: There wasn't any
6 more work after 1971.

7 CHAIRMAN GRIFFON: There wasn't?
8 So even --

9 DR. TAULBEE: It went away.

10 CHAIRMAN GRIFFON: And there would
11 be no residual exposures --

12 DR. TAULBEE: After the D&D phase,
13 they removed all of the ductwork, everything
14 within that particular facility associated
15 with it.

16 CHAIRMAN GRIFFON: Okay.

17 Arjun, do you have any more
18 follow-up on that?

19 DR. MAKHIJANI: No. So,
20 basically, you're not doing in vivo data?
21 That's the resolution of that piece of it is
22 there's going to be air --

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1 DR. TAULBEE: It will be air
2 samples, yes.

3 CHAIRMAN GRIFFON: It's all air
4 sampling, right.

5 DR. MAKHIJANI: Air sampling and
6 bounding dose. It is sort of like the Fernald
7 thorium --

8 DR. TAULBEE: That's correct.

9 DR. MAKHIJANI: -- in the early
10 period.

11 DR. TAULBEE: That's correct.

12 DR. NETON: It is a much more
13 discrete operation, though. It's smaller.

14 DR. MAKHIJANI: Yes, I understand,
15 but you're going to be relying exclusively on
16 air monitoring data.

17 DR. TAULBEE: That's correct.

18 DR. MAKHIJANI: Are there some
19 comparable, like, daily weighted average
20 reports and --

21 DR. TAULBEE: We have, on your
22 sample log sheets, we had the initial count,

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1 24-hour count, 72-hour count. We have
2 interviewed the radiation control technicians
3 who took the samples, and they indicated that
4 they were taken at nose height, where the
5 different workstations are. And you will see
6 this from the pictures, that there was only
7 specifically places within this room.

8 CHAIRMAN GRIFFON: But these are
9 area samples, not --

10 DR. TAULBEE: No, they're not --

11 CHAIRMAN GRIFFON: Not
12 breathing --

13 DR. TAULBEE: -- fixed-head air
14 samples. They are position, air-fit, an air
15 sampler that they would position --

16 CHAIRMAN GRIFFON: Okay.
17 Positioned near a job, yes.

18 DR. TAULBEE: That's correct.

19 CHAIRMAN GRIFFON: Okay.

20 DR. NETON: Semi-equivalent of
21 breathing zone air samples of that era.

22 CHAIRMAN GRIFFON: Yes, okay,

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1 right.

2 DR. NETON: Although I don't think
3 we have daily weighted average. We're not
4 relying on daily weighted average-type
5 measurements here. Aren't we using a
6 distribution?

7 DR. TAULBEE: We are using a
8 distribution, yes.

9 DR. NETON: And then selecting a
10 bounding value out of that distribution?

11 DR. TAULBEE: Right.

12 DR. MAKHIJANI: So it will be
13 different in that respect.

14 CHAIRMAN GRIFFON: Okay.

15 DR. NETON: But, for each of these
16 campaigns we have, air monitoring was being
17 conducted.

18 CHAIRMAN GRIFFON: Okay, let's go
19 on to item 3, recycled uranium.

20 DR. MAKHIJANI: Okay. Well,
21 you've seen the issue. You know, we didn't
22 think that you provided evidence of the

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1 bounding values of trace contaminants.

2 There are new contaminant data in
3 the revision of the TBD that hasn't been
4 published. Now are you going to publish that
5 so it's available or what? Because we have
6 not formally reviewed that.

7 DR. TAULBEE: My understanding --
8 and, Jim, correct me if I'm wrong -- is that,
9 after we finish our SEC deliberations, then at
10 that time we would publish updated, revised
11 TBD for external and internal, that we
12 probably would not publish them before that
13 time period.

14 DR. NETON: We are reluctant to
15 change these documents piecemeal. I mean
16 that's simply been our mode of operation while
17 we are undergoing these deliberations.

18 DR. MAKHIJANI: Yes, I understand
19 that about the TBD, but the evaluation report
20 -- we raised it in our TBD review of the
21 earlier version, and, you know -- it's
22 potentially an SEC issue, if you can't bound

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1 the thing. But the evaluation report makes no
2 mention of it. So it is a reason for us to
3 carry it over because the evaluation report
4 just doesn't deal with recycled uranium.

5 I am wondering whether you are
6 going to deal with it in the SEC context.

7 DR. TAULBEE: Well, who was
8 planning on dealing with it in the TBD
9 context, which is my question for you --

10 DR. NETON: Right. I mean, it
11 seems to me the question, I would have to
12 refresh my memory as to what our differences
13 in opinions were on the recycled uranium, but
14 it seems to me it was a matter of degree, and
15 not whether or not it could be bounded.

16 DR. MAKHIJANI: Well, at least our
17 comment, when we reviewed the discussion here,
18 was that NIOSH did not demonstrate that these
19 are bounding values. NIOSH was going to
20 provide a revision for the six impurities with
21 the largest impact on dose, and NIOSH stated
22 the generic TIB was about to be issued for

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1 recycled uranium, and that was in 2007. To my
2 knowledge, it has not been --

3 DR. TAULBEE: Rather than a
4 generic one, it is going to be in individual
5 TBDs.

6 DR. MAKHIJANI: Yes. So, you
7 know, when we reviewed it, and you know we
8 haven't done a comprehensive report, according
9 to our procedures of this, you know, made this
10 matrix in the way that I described, but it
11 didn't seem that the concerns that we had
12 raised were addressed enough to discriminate
13 that it's a TBD issue and it is being resolved
14 so far as bounding dose is concerned. We
15 didn't think so.

16 CHAIRMAN GRIFFON: I mean, maybe
17 someone can refresh my memory on the pathways
18 for the exposures to the contaminants. In
19 other words, usually where we get into some
20 trouble with recycled uranium issues is if
21 certain nuclides are going to concentrate out
22 in different areas of the process. I'm not

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1 sure that, Jim or Tim, I'm not sure if that's
2 the --

3 DR. NETON: I would have to go
4 back and relook at this issue.

5 CHAIRMAN GRIFFON: Yes.

6 DR. NETON: Because we thought we
7 went down the pathway quite a bit about
8 resolving this recycled uranium issue, unless
9 I'm thinking of another site, but I thought it
10 was --

11 DR. TAULBEE: No. No, we did.
12 It's just that the final, the decision,
13 instead of a generic TIB, was to break it
14 out --

15 DR. NETON: Right.

16 DR. TAULBEE: -- more of the site-
17 specific. And you're right from the
18 concentration standpoint. You know, Savannah
19 River, the uranium was received in the most
20 part coming from Fernald. Well, it would
21 leave the 200 area, go back to Fernald, and
22 then come back.

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1 You know, recycled uranium is kind
2 of a continuous process at Savannah River,
3 almost starting from the very earliest, the
4 1960 timeframe. They were shipping uranium
5 offsite for reprocessing, and this was
6 irradiated uranium. So it did have trace
7 contaminants of plutonium and some of the
8 other isotopes in it.

9 So this issue of recycled uranium
10 was evaluated by the site. You know, it is in
11 the 1960 works technical report; there's
12 indication of them looking at the health
13 physics concerns associated with this. They
14 were well aware of the particular issue.

15 And I feel that we have access to
16 sufficient data. What you have with regard to
17 us being able to bound it --

18 DR. MAKHIJANI: Well, the specific
19 thing, the reason this is in here is, even the
20 latest revisions, the unpublished revision of
21 the TBD, where you have some trace contaminant
22 data, goes to creation of LaVon's report for

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1 2000. That's described in the issue here in
2 the matrix.

3 But you did not address in that
4 revision of the TBD the specific data that we
5 had cited in our TBD review regarding recycled
6 uranium. And recycled uranium at Savannah
7 River Site is actually pretty complicated.
8 You know, there's not one stream of recycled
9 uranium. There are many streams of recycled
10 uranium. I think it actually goes back
11 probably before 1960 because some of the
12 target rods may have been recycled uranium,
13 like from Hanford, if I'm remembering
14 correctly.

15 I mean you have to look at -- I
16 will have to go back and look at the review in
17 detail, but then there are the cans, you know,
18 the drumming operations for recycled. There's
19 a lot of different operations with recycled
20 uranium at the Savannah River Site. I mean
21 there's still tens of thousands of drums of
22 recycled uranium at the Savannah River Site

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1 that have trace contaminants, and the
2 different streams will have different trace
3 contaminants.

4 The problem here is that we cited
5 certain data and references in our TBD review
6 that have not been addressed to date, even in
7 the unpublished TBD.

8 DR. TAULBEE: All right.

9 CHAIRMAN GRIFFON: Yes, we will
10 have to look back at this, I think. I've got
11 to refresh my memory on this, too.

12 But, I mean, it may come down to
13 -- it depends on what types of exposures and
14 potentials here. But, I mean, if it is a
15 matter of varying concentrations, and you can
16 just go with the highest end bound, that's one
17 thing. But if you have -- you know, I always
18 go back to that bounding for all members of
19 the class issue. And if you have one area
20 where it is concentrating out very differently
21 than most of the plant -- this is the Paducah
22 situation, you know, the whole case of Paducah

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1 where you had the one area where there was
2 quite a bit more going on with it than in
3 other areas of the plant.

4 DR. TAULBEE: Right. At Savannah
5 River, the 200 area coming off the A line from
6 the canyons, which is where you have the
7 uranium coming off, and then in the 300 area,
8 and then research in the 700 area, those are
9 the primary areas where you have this recycled
10 uranium issue.

11 When you get to the reactors,
12 well, it's already canned. So that's not a
13 problem.

14 DR. MAKHIJANI: Right. I would
15 agree.

16 DR. TAULBEE: We can certainly
17 look again at your documents. I have not
18 personally looked at them.

19 DR. MAKHIJANI: That's what I am
20 suggesting. When I reviewed this, preparing
21 this matrix, we found that there were data
22 that we had cited that are not addressed in

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1 anything that you have done.

2 CHAIRMAN GRIFFON: And for
3 purposes of discussion, I mean I guess these
4 tables that are referenced in the revised
5 TIB-4-e, I mean I think we --

6 DR. MAKHIJANI: Yes, we could
7 provide that.

8 CHAIRMAN GRIFFON: Yes, we should
9 consider those, right, even though you're
10 holding off on publishing, I understand. But,
11 you know, that's your most current --

12 DR. MAKHIJANI: Because I believe
13 it is on the O: drive.

14 CHAIRMAN GRIFFON: Right, right,
15 right.

16 DR. MAKHIJANI: That's the only
17 way I would have had access to it.

18 CHAIRMAN GRIFFON: Yes, yes, yes.

19 MEMBER CLAWSON: How are we
20 keeping track of these changes? I know there
21 are numerous times that we get into this, and
22 I understand about the TBD being changed just

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1 once, but how are we keeping track of
2 everything that needs to be done?

3 CHAIRMAN GRIFFON: What is agreed
4 to be changed, or whatever?

5 MEMBER CLAWSON: Right, yes.
6 Because, so many times, okay, yes, this is
7 going to be changed when we update the TBD. I
8 just want to make sure we don't lose track of
9 everything that was going to be changed in it
10 because sometimes if it's been a long time --

11 CHAIRMAN GRIFFON: Yes. No, I
12 think it is through the use of the matrices --

13 MEMBER CLAWSON: Okay.

14 CHAIRMAN GRIFFON: -- is how we
15 are going to have to track that, you know.
16 But I'm not saying it is a perfect process,
17 but that is what we have been working with,
18 yes.

19 Okay, but is it fair to say the
20 most current approach would be outlined in
21 that 4-e?

22 DR. TAULBEE: That's correct.

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1 CHAIRMAN GRIFFON: So, from your
2 standpoint looking back at it again, I guess
3 the most -- and I'm assuming is it
4 Crase/LaBone or Crase -- it's Crase? Is that
5 right? Crase/LaBone, that document, it has to
6 be on the O: drive as well. I don't know if
7 you've found that, Arjun, but --

8 DR. MAKHIJANI: I think we have
9 it.

10 CHAIRMAN GRIFFON: Yes, okay.

11 DR. MAKHIJANI: Because we've
12 looked at it.

13 CHAIRMAN GRIFFON: So I guess I
14 would ask --

15 DR. MAKHIJANI: I haven't looked
16 at it recently, but my note would indicate
17 that we reviewed that.

18 CHAIRMAN GRIFFON: Okay. I guess
19 I would ask, when we come back, you know,
20 everybody has got to kind of relook at this
21 information with the eye on the question of,
22 is it a site profile issue or an SEC issue?

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1 DR. TAULBEE: I know that
2 Crase/LaBone indicated that the contribution
3 to dose was on the order of about 10 percent
4 greater than uranium. So it is not a huge
5 correction from that standpoint for the
6 Savannah River Site.

7 CHAIRMAN GRIFFON: That percentage
8 sounds common for several other sites, too, on
9 recycled uranium. Yes, it sounds pretty
10 familiar, yes.

11 Okay, so that is good there. We
12 are both going to relook. Everybody is going
13 to go back and look at the TBD issue.

14 DR. MAKHIJANI: Okay. So that is
15 an action item for both?

16 CHAIRMAN GRIFFON: For both, yes,
17 it is. Yes.

18 I'm going to ask now if we could
19 take just a little comfort break. I need more
20 coffee.

21 (Laughter.)

22 And it seems like a good break

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1 point because we will plan on lunch at around
2 noon, if that is okay with everybody, and on
3 the phone, if you're planning your day.

4 All right. We'll take a 10-minute
5 break. Be back at eleven o'clock Eastern.

6 Thanks.

7 (Whereupon, the above-entitled
8 matter went off the record at 10:49 a.m. and
9 resumed at 11:02 a.m.)

10 MR. KATZ: We are starting back up
11 again, the Savannah River Site Work Group.

12 Mark?

13 CHAIRMAN GRIFFON: Okay. I'm just
14 ready to move ahead to item No. 4. I'll ask
15 the same process, that Arjun introduce the
16 item.

17 DR. MAKHIJANI: Okay. There are a
18 lot of complicated issues with americium,
19 curium, and californium. The evaluation
20 report said that they are going to consider
21 them together, simply analyzed together.

22 We didn't find any thorium data

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1 until 1963. The construction worker data are
2 almost non-existent until the 1990s, I think.

3 For americium, there are 100 data points for
4 americium. They are almost all from the same
5 worker.

6 DR. TAULBEE: For clarification,
7 you're talking about the NOCTS dataset, is
8 that correct?

9 DR. MAKHIJANI: Yes.

10 DR. TAULBEE: Okay.

11 DR. MAKHIJANI: Yes. The data
12 that we have reviewed is the claimant data
13 that you compiled and posted for
14 construction/non-construction.

15 So we found very scant -- there is
16 so little data that we couldn't even analyze
17 it in the report that you are going to get.

18 Then, in addition, I should have
19 remembered to ask Joyce to be on this, but
20 Joyce didn't report back to me on this.
21 Sometime back, when I started doing this, I
22 sent Joyce a question as to how californium

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1 dosage would be reconstructed, once
2 californium was inhaled. Specifically, the
3 high spontaneous fission rate inside the body
4 would create neutron doses all over. So,
5 besides the local output dose, you would have
6 a complicated set of neutron doses because of
7 internal spontaneous fission.

8 And Joyce didn't have a ready
9 answer to me, and she sent around an email to
10 a bunch of people, and I have yet to receive
11 -- maybe it fell through the cracks for all
12 the many people that she contacted, but I have
13 yet to receive an answer.

14 I just wanted to say that that's
15 sort of the last sentence in the issue
16 description there. NIOSH said that they are
17 going to do a coworker model, but we didn't
18 think that there was enough data for a
19 coworker model in the claimant database.

20 DR. TAULBEE: Okay. Well, we are,
21 with all the coworker models, and this is
22 going to cover really issues 4, 5, 6, 7, 8, 9,

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1 and 11, effectively. Let me give you a little
2 bit of an update from this standpoint.

3 They first indicate that the need
4 for a coworker model at Savannah River is
5 actually quite low compared to other sites.
6 The reason that I say that is, 1) we have a
7 large amount of individual monitoring data
8 among the claimants.

9 Number 2, we have OTIB-0001, which
10 is the high-five analysis that is done that we
11 will apply to most, well, to many workers.
12 Whether they have monitoring data or not, we
13 will apply that to non-compensable type of
14 cases, for non-metabolic-type cancers.

15 So that one has been used
16 extensively at Savannah River. In many cases,
17 those that have a respiratory tract cancer,
18 many of them are compensable based upon a
19 missed dose of plutonium alone.

20 So the actual need for a coworker
21 model at Savannah River is really quite low.
22 Now what we have done as part of this, because

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1 we do recognize there are time periods where
2 there are people who don't fall into those two
3 categories, and we do need a coworker model,
4 and I can think of the last six months of one
5 particular case, but that is about it. You
6 know, we are talking very small numbers here
7 of people that would need a coworker model.

8 So we started developing these
9 coworker models based upon the data that's in
10 NOCTS, but we are not relying solely on NOCTS.

11 When we have information that is limited, as
12 you are talking about there, Arjun, we go back
13 to the bioassay log books and we're coding the
14 data, such that we can get a sufficiently
15 valid sample in order to develop the coworker
16 model.

17 We have a scheduled breakdown of
18 the trivalent nuclides, the neptunium, the
19 fission products, the polonium, plutonium, and
20 uranium. These are all broken down by
21 schedule, and the completion date for the
22 complete coworker model is not until June of

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1 this coming year. They're all going in a
2 series at this time.

3 The report for the trivalent
4 actinides is actually due this week, by the
5 Gantt chart. So our contractors have been
6 working on that. So we will look at the data
7 when it comes through, hopefully, later this
8 week.

9 I think your comment applies to
10 the next one as well, the neptunium, and so
11 forth, in that --

12 CHAIRMAN GRIFFON: Yes, we may not
13 have to go through this every time, but yes.

14 DR. TAULBEE: Right. The schedule
15 for that one is February 25th, is when we will
16 receive the model. Now keep in mind that we
17 will make recommendations back to our
18 contractor as to whether we feel the data is
19 sufficient, and if it is not, then there will
20 be a step of coding more data until we get a
21 valid model that we feel comfortable with.

22 CHAIRMAN GRIFFON: I'm sorry, you

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1 said February with an opinion?

2 DR. TAULBEE: That's right.

3 That's when we will see it.

4 CHAIRMAN GRIFFON: Right.

5 DR. TAULBEE: And then these are
6 interim reports that we are getting at this
7 point.

8 CHAIRMAN GRIFFON: Right.

9 DR. TAULBEE: For the fission and
10 activation products, this is Issues 6 and 7,
11 I've lumped them together --

12 CHAIRMAN GRIFFON: Yes, that's
13 fine.

14 DR. TAULBEE: -- because of the
15 cobalt-60.

16 The interim report is due March
17 31st to NIOSH. And I don't think you broke
18 out the plutonium and uranium. We have
19 actually received an interim for plutonium,
20 and with uranium, it was lacking in the
21 earlier years. So we have gone back and
22 started coding the data.

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1 CHAIRMAN GRIFFON: You mentioned
2 that, yes.

3 DR. TAULBEE: So that is where we
4 are at with all of these coworker models.

5 CHAIRMAN GRIFFON: And when is the
6 uranium one scheduled for? You've got
7 plutonium and uranium done?

8 DR. TAULBEE: Right.

9 CHAIRMAN GRIFFON: Interim ones?

10 DR. TAULBEE: The uranium one is
11 being revised right now. So that should be
12 done February 5th, is when the data will be
13 coded. I believe it's two weeks for the
14 analysis afterwards. So it would be mid-
15 February when we will get the report and then
16 two weeks for an ADC review. So it would be
17 in the March timeframe.

18 CHAIRMAN GRIFFON: And plutonium
19 was --

20 DR. TAULBEE: Plutonium, we've
21 already received the interim report.

22 CHAIRMAN GRIFFON: And you've

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1 given comments back to look for more data or
2 you have the additional data? You just need
3 to code more data?

4 DR. TAULBEE: We are looking at
5 that right now.

6 CHAIRMAN GRIFFON: Okay, okay.
7 Thanks.

8 DR. TAULBEE: Okay. So, if I
9 understand your concern, Arjun, it is that,
10 from the NOCTS data, you are finding that
11 there aren't any or you're having limited
12 construction trades workers' data? Is that
13 correct?

14 DR. MAKHIJANI: That is right. I
15 mean, for these radionuclides -- Steve, are
16 you on the line yet?

17 MR. MARSCHKE: Yes, I'm here,
18 Arjun.

19 DR. MAKHIJANI: Okay. I
20 personally did not look at the non-
21 construction worker data for these
22 radionuclides because I was focused on, you

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1 know, can you compare it to construction
2 workers as an initial, and we didn't include
3 it in the paper you are going to get because,
4 as you will see, for construction workers,
5 there is almost no data.

6 For non-construction workers,
7 there are more data, but have you looked at
8 americium, curium, neptunium, californium non-
9 construction worker data?

10 MR. MARSCHKE: I'm just looking at
11 the californium right now, and there's about
12 480 data points for the californium-252.

13 DR. MAKHIJANI: Okay.

14 MR. MARSCHKE: Basically, it has
15 gone up to maybe 400 data points or 300 data
16 points for curium. But there are more data
17 points for the non-construction worker, but in
18 the claimant database there's still a whole
19 lot by the time you divide it up amongst the
20 various decades or years, whichever way you do
21 it, and work areas, if you decide to do it
22 that way.

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1 CHAIRMAN GRIFFON: Okay. Thanks.

2 DR. MAKHIJANI: Just a couple of
3 comments. We have found it necessary to
4 divide it up by work area, because when you
5 parse it by work area or by job type
6 separately, we didn't do joint of all because
7 then you get too few data points. But the
8 doses between workers and work areas for
9 different radionuclides are very, very
10 different.

11 DR. TAULBEE: And we have done
12 that as well.

13 DR. MAKHIJANI: Oh, so you have
14 done that?

15 DR. TAULBEE: Yes.

16 DR. MAKHIJANI: Okay.

17 DR. TAULBEE: And that is one of
18 the reasons why we had to go back for the
19 uranium particular data.

20 DR. MAKHIJANI: Okay.

21 DR. TAULBEE: When we did parse it
22 out by the 200 area versus the 300 area, we

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1 did not have sufficient 300 area data. So
2 that's why we started --

3 DR. MAKHIJANI: So, qualitatively,
4 that addresses one of our concerns.
5 Obviously, we will look at your reports when
6 you have done them.

7 The comparison with construction
8 workers will continue --

9 CHAIRMAN GRIFFON: Right.

10 DR. MAKHIJANI: -- to be an issue.
11 So, whether we have identifiable construction
12 worker data for the various periods, this is a
13 sort of continuing theme.

14 CHAIRMAN GRIFFON: Yes.

15 DR. MAKHIJANI: We discussed this
16 briefly, you and I, Mark, in preparation for
17 this meeting, but I did not put the high-five
18 issue explicitly in this matrix. I did review
19 the high-five issue, but felt that it was
20 being used only in the context of 42 CFR 82
21 for non-compensable efficiency purposes.

22 And the whole framework of the SEC

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1 is very different. So you can't use that to
2 show bounding dose within the 83 framework
3 because it's an efficiency.

4 The other thing is, and you have
5 not addressed this, to my memory, in our TBD
6 review, we extensively looked at the high-five
7 question in various parts of the TBD review.
8 We illustrated that in some cases at least
9 that we could readily identify some, if I
10 remember correctly, cesium-137 intakes that
11 are documented that are higher than the high-
12 five, the lower of the high-five, or not in
13 the high-five. And the high-five are,
14 therefore, not high-five.

15 CHAIRMAN GRIFFON: Yes, I think I
16 remember that for uranium, actually, yes.

17 DR. MAKHIJANI: These are --

18 DR. TAULBEE: These are high
19 intakes that have been documented at the site.

20 These are not necessarily the highest. We
21 intended to try to get the highest, but we
22 recognize that we didn't, but these are still

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1 high intakes, documented intakes of exposure
2 to workers.

3 So, when we apply this to somebody
4 who doesn't have any positive bioassay, we
5 feel this is bounding.

6 DR. MAKHIJANI: Yes, but one of
7 the comments in the TBD was that, in the
8 context of 42 CFR 82, which was what was the
9 subject being reviewed at the time, there was
10 no SEC petition, that you hadn't shown that it
11 was the max.

12 Under the efficiency process, you
13 say that is the maximum feasible dose and you
14 are applying the high-five. I don't remember
15 the language of OTIB-1, but you present it as
16 the highest intake.

17 But we have documented intakes
18 that are not in your high-five, and we also
19 said that they are not the maximum. You
20 haven't demonstrated them as maximum doses.

21 So there are two levels of
22 problems. Now I do not know how those

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1 problems are to be translated into the SEC
2 context because it is an efficiency procedure.

3 DR. NETON: I don't think that it
4 is relevant for the SEC necessarily.

5 DR. MAKHIJANI: Well, from what I
6 understood Tim to say --

7 CHAIRMAN GRIFFON: No, he just
8 said that that was one of the methods that
9 they were using --

10 DR. MAKHIJANI: For dose
11 reconstruction.

12 CHAIRMAN GRIFFON: I wanted to go
13 back to that, yes. It is probably more
14 relevant in dose reconstruction. I am
15 interested in the way Tim phrased that from a
16 dose reconstruction standpoint though, but
17 that can come back to the Subcommittee when we
18 review Savannah River cases. We have several
19 of them.

20 DR. TAULBEE: Yes, but my reason
21 for bringing it up was to indicate that the
22 need for a coworker model --

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1 CHAIRMAN GRIFFON: Is minimal,
2 right. Right.

3 DR. TAULBEE: -- at Savannah River
4 is minimal, and that's why it's got a lower
5 priority.

6 CHAIRMAN GRIFFON: Yes.

7 DR. NETON: Let me just interject
8 here. I mean, that is a true statement, but I
9 guess in some ways that is really not relevant
10 to sort of what we are trying to do here.

11 CHAIRMAN GRIFFON: Yes.

12 DR. NETON: Because the issue is
13 that we need to demonstrate that we can do all
14 cases.

15 CHAIRMAN GRIFFON: For all
16 workers.

17 DR. NETON: If there's one or two,
18 then we need to reconstruct that.

19 CHAIRMAN GRIFFON: Yes, right.
20 Right.

21 DR. NETON: So I understand what
22 Tim is saying. There is very little need for

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1 a coworker model, but that doesn't obviate the
2 issue that we need to go out and develop
3 something for all cases.

4 CHAIRMAN GRIFFON: Can I just, can
5 I just ask --

6 DR. TAULBEE: That is why the
7 schedule was so late. That was my point of
8 bringing it up.

9 DR. NETON: Right.

10 DR. TAULBEE: In order to get
11 claims out, it is not a huge priority.

12 CHAIRMAN GRIFFON: When you
13 started your discussion of this item, Tim, you
14 mentioned high-five for the non-compensable
15 cases, and then another method for other
16 cases. Then you had like one or two that
17 remained that would have needed a coworker
18 model.

19 What is the other means for
20 reconstructing for these exotics or --

21 DR. TAULBEE: They are effectively
22 needing a coworker model.

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1 CHAIRMAN GRIFFON: Oh, okay. So
2 what do you do if something is not clearly on
3 the non-compensable? You know, if you use the
4 high-five and it goes over, then what do you
5 do? It sits there? It's waiting for a
6 coworker model?

7 DR. TAULBEE: It's effectively
8 waiting, yes.

9 CHAIRMAN GRIFFON: Okay, okay.

10 DR. TAULBEE: Yes.

11 CHAIRMAN GRIFFON: And there's
12 only one of those in the whole --

13 DR. TAULBEE: I believe so right
14 now, yes.

15 CHAIRMAN GRIFFON: So every other
16 case has used high-five?

17 DR. TAULBEE: High-five or they
18 are already compensable due to respiratory-
19 type --

20 CHAIRMAN GRIFFON: Got you.

21 DR. TAULBEE: -- tract cancers.
22 Or there's clear indication in the records

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1 that they only were exposed to environmental
2 monitoring levels, and all their work was in
3 outside areas. They were cutting grass, that
4 type of area. And we have clear indication of
5 that in the records, through their interview,
6 through their dosimetry --

7 CHAIRMAN GRIFFON: And then they
8 get an environmental model?

9 DR. TAULBEE: They get an
10 environmental model.

11 CHAIRMAN GRIFFON: I'm sorry.
12 Okay. All right. Okay. I just wanted to
13 clarify that.

14 DR. TAULBEE: So that is what the
15 20 percent of the people that we don't have
16 internal monitoring on, which is a relatively
17 small population.

18 CHAIRMAN GRIFFON: Now what about
19 the californium issue? I guess you are going
20 to check with Joyce a little bit more on this
21 and Jim --

22 DR. MAKHIJANI: I did not get an

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1 answer from Joyce. I guess it would be
2 interesting to have NIOSH's view on this.

3 CHAIRMAN GRIFFON: Yes.

4 DR. MAKHIJANI: I'm just putting
5 it on the table. We're looking at it, but
6 having a hard time.

7 I know I sent two or three
8 reminders to Joyce. She sent reminders out.
9 People seem to be puzzled by it.

10 DR. NETON: I certainly haven't
11 delved into californium-252 dosimetry very
12 much, but I did a quick check and there is an
13 ICRP model for californium-252, which would
14 imply, since those are effective-dose
15 equivalent values that are calculated for the
16 derived air concentrations, that the dose to
17 all the relevant organs must have been
18 considered in some way. We would have to go
19 back and verify --

20 CHAIRMAN GRIFFON: I believe
21 that's the question, though.

22 DR. NETON: Yes.

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1 CHAIRMAN GRIFFON: Make sure they
2 considered it when doing the fission
3 component --

4 DR. NETON: I would imagine, I
5 mean they're pretty good about correcting for
6 all those different emissions. So we can go
7 back and verify that that has been done, but
8 if there's an ICRP model and there are
9 committed effective dose equivalents, I
10 suspect that we could use those data to
11 reconstruct internal exposures.

12 CHAIRMAN GRIFFON: That model,
13 right. Yes, I agree. That's just the
14 outstanding question to be asked.

15 DR. NETON: And there is an ICRP
16 on all these sort of exotics, the top end of
17 the periodic table isotopes.

18 DR. MAKHIJANI: Yes, so I'm happy
19 if you look at the ICRP model --

20 CHAIRMAN GRIFFON: Right.

21 DR. MAKHIJANI: -- and say that it
22 includes various neutron doses from internal

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1 spontaneous fission.

2 DR. NETON: Right. Yes, we can
3 verify that. That's the issue.

4 MR. KATZ: Okay. So that's an
5 OCAS action item.

6 CHAIRMAN GRIFFON: Okay.

7 DR. MAKHIJANI: I guess,
8 generally, it's spontaneous fission.

9 DR. NETON: Yes.

10 DR. MAKHIJANI: It is more
11 complicated, then, because you have a 200 MeV.

12 DR. NETON: What I have seen in my
13 brief look, that it is primarily a lung-
14 seeker, like a lot of the elements of the
15 bones. It can be fairly substantial.

16 CHAIRMAN GRIFFON: Yes.

17 DR. NETON: I'm curious, I don't
18 know. What is the source of the californium
19 exposures at Savannah River?

20 DR. TAULBEE: They made it. They
21 made the californium.

22 DR. NETON: For the neutron --

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1 DR. TAULBEE: Yes.

2 DR. NETON: Essentially,
3 neutron --

4 DR. TAULBEE: Yes, they made the
5 neutron sources in the high-level caves, in
6 the 773 area.

7 CHAIRMAN GRIFFON: Okay. I'm not
8 sure we have to go through all these, at least
9 in this much --

10 DR. MAKHIJANI: No, no.

11 CHAIRMAN GRIFFON: I think it
12 covers a lot of these, Arjun.

13 DR. MAKHIJANI: No.

14 CHAIRMAN GRIFFON: But we will
15 continue on to Number 5, but if it is the same
16 as Number 4, you can just --

17 DR. MAKHIJANI: Well, I think it
18 is the same. I agree with Tim.

19 CHAIRMAN GRIFFON: Yes.

20 DR. MAKHIJANI: And hearing Tim's
21 timeline, and the fact that at least one of
22 our significant concerns is parsing by area

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1 already being recognized as you have gone
2 through the data, I think it is best in terms
3 of these issues just to wait for the NIOSH --

4 CHAIRMAN GRIFFON: Yes, yes, sure.

5 I just wanted to make sure I don't miss any
6 sub-issues as we are going through them. So I
7 will just quickly go over each one.

8 DR. MAKHIJANI: Let me just
9 quickly make sure that we're not.

10 CHAIRMAN GRIFFON: Yes. Yes.

11 Let me ask, while you are looking
12 at that, Arjun, the log books you mentioned on
13 all this stuff; are those scanned and in the
14 O: drive or are those --

15 DR. TAULBEE: Yes, those are on in
16 SRDB.

17 CHAIRMAN GRIFFON: So, if you need
18 access to those, SC&A or others --

19 DR. MAKHIJANI: Yes.

20 CHAIRMAN GRIFFON: -- that have
21 insomnia problems --

22 (Laughter.)

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1 There's some good reading on the
2 O: drive, yes. Okay. Books of numbers, yes.
3 Okay.

4 DR. MAKHIJANI: The one question I
5 have, reviewing these items, is, are you
6 parsing strontium-90 separately because
7 strontium-90 data are indicated separately,
8 and the ER mentions it separately as starting
9 in the late 1950s? So, are you doing it
10 jointly with other fission products or are you
11 doing it separately?

12 DR. TAULBEE: We are primarily
13 doing it jointly with the other products. The
14 process for analysis was a gas proportional-
15 type analysis, a direct mounting of the
16 bioassay. So the strontium-90 would be
17 incorporated in that particular analysis, if
18 there is exposure for it.

19 There are some bioassay records
20 that did further separation, but we weren't
21 going to break that out into a separate
22 coworker model because the data is quite

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1 limited.

2 DR. MAKHIJANI: Yes. And are you
3 going to specify how you are going to deal
4 with a collection of fission products in terms
5 of bounding those in your model?

6 DR. TAULBEE: I believe so, yes.

7 DR. NETON: Yes, that would be
8 part of our standard --

9 CHAIRMAN GRIFFON: Okay. So,
10 Arjun, that takes us through 6 and 7, I think.

11 DR. MAKHIJANI: Yes, let me
12 just --

13 CHAIRMAN GRIFFON: Yes.

14 DR. MAKHIJANI: I'm just writing
15 my note.

16 MEMBER CLAWSON: I think 8, too,
17 doesn't it?

18 CHAIRMAN GRIFFON: Yes, probably.
19 I am just making sure there are no sub-
20 issues.

21 DR. TAULBEE: I do want to mention
22 a little bit about the polonium work. This

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1 was very limited at the Savannah River Site,
2 the potential for exposure to the 773A area.
3 Now Savannah River radiated a lot --

4 CHAIRMAN GRIFFON: I am sorry,
5 773?

6 DR. TAULBEE: 773A, yes. It's a
7 matter of overlap.

8 CHAIRMAN GRIFFON: Yes. Okay.

9 DR. TAULBEE: Now Savannah River
10 did irradiate a lot of bismuth for the Mound
11 plant during this time period. But, after it
12 came out of the reactors, it was shipped
13 directly up to Mound. So, during those
14 polonium production years, if you will, the
15 exposure to Savannah River personnel was
16 minimal. As it came out of the reactors, it
17 was highly radioactive. It was still sealed
18 and shipped up to Mound.

19 Now there was some work done, as I
20 mentioned, in 773A in some laboratories, where
21 they were doing some other work, doing some
22 minor development of heat source and heat

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1 transfer-type studies. That is where the
2 bioassay focus is on, within that particular
3 area.

4 So a coworker model for this
5 particular isotope would be very limited in
6 scope, is what I want to communicate to you
7 all because of that reason.

8 DR. MAKHIJANI: But you are
9 developing one?

10 DR. TAULBEE: Yes.

11 CHAIRMAN GRIFFON: Can you tell
12 me, Arjun, I'm highlighting this for you
13 mainly, in the issue description it says,
14 incidents are not addressed. Is that
15 particular to this one? I didn't see that in
16 other --

17 DR. MAKHIJANI: Well, there's a
18 whole separate item on incidents.

19 CHAIRMAN GRIFFON: Yes.

20 DR. MAKHIJANI: You know, in these
21 sources that were not processed at Savannah
22 River Site, as it says in the item down below

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1 in the matrix, it kind of reminded me of the
2 Y-12 situation where there were incidents,
3 but, ultimately, there was no dosimetry useful
4 information.

5 And the other thing is in our TBD
6 review we had quite extensively documented
7 that site incident list, the SHI list is
8 incomplete.

9 DR. TAULBEE: When you say
10 incomplete, what are you --

11 DR. MAKHIJANI: We show we can
12 document incidents that are not in there.

13 DR. TAULBEE: But there is a
14 criteria that the incident had to be above a
15 certain level in order to be documented. So
16 we recognize that there's different tiers of
17 incidents, and, clearly, there are many
18 incidents, many, many incidents that are not
19 documented in the SHIs.

20 DR. MAKHIJANI: I think we only --

21 DR. TAULBEE: But they didn't
22 raise to a certain level to be documented that

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1 way.

2 CHAIRMAN GRIFFON: Right. And
3 rightly so, you're saying?

4 DR. TAULBEE: Yes. Right.

5 CHAIRMAN GRIFFON: Yes, yes.

6 DR. MAKHIJANI: Well, I don't
7 believe that NIOSH has ever explicitly
8 addressed that finding, but to my memory -- I
9 was part of putting that table together, when
10 we did that TBD review. I believe that we
11 only included pretty serious incidents.

12 CHAIRMAN GRIFFON: Which you think
13 should have been included?

14 DR. MAKHIJANI: Right.

15 CHAIRMAN GRIFFON: Okay.

16 DR. MAKHIJANI: Now I don't recall
17 myself having seen if there is sort of a
18 document that says this is the threshold --

19 DR. TAULBEE: There is. There are
20 procedures.

21 DR. MAKHIJANI: And I would like
22 to see that. So maybe we might need to go

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1 back, but I think if you look at our TBD, I
2 really do request you to look at our TBD
3 review in this regard because there is quite a
4 lot of documentation in there about these
5 things, along with records.

6 DR. NETON: Okay. I guess I would
7 like to explore that a little bit. We have
8 been down this path with incidents on a number
9 of different sites. It seems we have come to
10 the general agreement that, if we have a
11 fairly good, routine monitoring program and we
12 assign exposures to unmonitored workers based
13 on that routine monitoring program, that that
14 encompasses the incidents that might have
15 occurred during the workers' exposure periods.

16 So are we saying that there are
17 not routine monitoring programs or is it that
18 we don't have coworker models right now that
19 have been evaluated, that can be evaluated
20 against how they address those incidents? I
21 mean, I'm --

22 DR. MAKHIJANI: Well, in this

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1 context, you know, for construction workers,
2 which is what we are looking at right now, it
3 seems to us that where we are in the
4 preliminary stage of the review, that the
5 internal monitoring data for construction
6 workers, when you look at it by area, so far
7 as the claimant database is concerned and
8 radionuclides, in many cases it is not
9 extensive.

10 So this coworker model is going to
11 have to be used much more then, I think,
12 unless you have more data and you are
13 compiling it, and we will certainly look at
14 it. So that is one thing.

15 The other thing is that a lot of
16 workers that we interviewed, and Brad was
17 there during this interview, said that very
18 often, when construction workers were
19 involved, there was little HP coverage and
20 incidents were often not recorded. It also
21 corresponded to what we found earlier without
22 reference to construction workers in our own

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1 TBD review.

2 So the question is here you have
3 several workers, but you don't have a whole
4 lot of data, and you are going to have to use
5 a coworker model, and how are you going to
6 incorporate incidents into that?

7 DR. NETON: Understood.

8 MR. WARREN: Mark, this is Bob
9 Warren.

10 CHAIRMAN GRIFFON: Hold on.

11 MR. WARREN: Before you leave this
12 discussion --

13 MR. KATZ: I'm sorry, Bob, before
14 you carry on, there's someone else on the line
15 who doesn't have their phone on mute, and
16 we're listening to your conversation, your
17 side conversation. Can you please mute your
18 phone?

19 The person who is talking right
20 now, would you please mute your phone? Excuse
21 me. Someone is talking about Miami, or what
22 have you on the phone. Would you please mute

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1 your phone? Or you can use *6, if you don't
2 have a mute button.

3 Thanks.

4 Okay, Bob, sorry.

5 MR. WARREN: Before we leave this
6 thing about the logs, the log books, I want to
7 make sure at some point that you are aware
8 that we've got testimony about two sets of log
9 books, and the Audit Committee did some
10 interviews with that.

11 So, when NIOSH says that they rely
12 on log books, I just want to make sure that
13 everybody knows that we don't think they're at
14 all that accurate.

15 DR. TAULBEE: If I could respond
16 to that, the log books that we are talking
17 about are bioassay log books, and I believe
18 the log books that you're referring to from
19 previous discussions that we have had are the
20 health physics record log books --

21 MR. WARREN: Right. Okay.

22 DR. TAULBEE: -- that would

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1 discuss different operations.

2 MR. WARREN: Okay. I hear you.

3 CHAIRMAN GRIFFON: Thank you,
4 though. That's good clarification.

5 Okay, let's make sure we're
6 covering all these then. Arjun, just to go
7 down the line --

8 DR. MAKHIJANI: Yes.

9 CHAIRMAN GRIFFON: -- the tritium,
10 Number 9?

11 DR. MAKHIJANI: Let's see, now I
12 lost my matrix.

13 MR. KATZ: Could I just ask about
14 the action item on the last? Maybe I missed
15 it because of the interference there.

16 But is SC&A checking to see the
17 metric that they used for inclusion of
18 incidents?

19 CHAIRMAN GRIFFON: I think Tim
20 said that you've got the procedure available,
21 right?

22 MR. KATZ: Right.

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1 DR. TAULBEE: There's a procedure
2 that identifies what constituted a special
3 hazard to the station.

4 CHAIRMAN GRIFFON: Where the
5 cutoff was, right.

6 DR. TAULBEE: Where the cutoff
7 was. And it was monetary and lost work time
8 type of cutoff.

9 CHAIRMAN GRIFFON: So maybe Arjun
10 can get that from NIOSH.

11 DR. MAKHIJANI: Inside the O:
12 drive, there's an Arjun directory that's
13 probably acceptable.

14 (Laughter.)

15 I think there is even an SRS
16 subdirectory.

17 CHAIRMAN GRIFFON: But I think,
18 you know, there is an SRS subdirectory. I
19 think we can stick the same protocol posted
20 there on SRS. We can all put it in our own
21 folders. Okay.

22 All right, then going back to

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1 Number 9, Arjun.

2 DR. MAKHIJANI: Number 9?
3 Tritium. Yes, there are quite a lot of data
4 for tritium, and we did find the construction
5 worker/non-construction worker by area problem
6 with tritium. I presume you are addressing
7 that?

8 DR. TAULBEE: Is this in your
9 analysis?

10 DR. MAKHIJANI: It will be in our
11 analysis.

12 CHAIRMAN GRIFFON: It is in there,
13 so you will see that soon.

14 DR. TAULBEE: I would like to see
15 that, yes.

16 CHAIRMAN GRIFFON: Once we see the
17 report, yes.

18 DR. MAKHIJANI: And special
19 tritium compounds, at the present time in the
20 context, we have not gone beyond our general
21 analysis. You referred to TIB-0066. We have
22 had this discussion in the Mound context. I

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1 think SC&A, we need to revisit this in the SRS
2 context, unless you are revisiting it in the
3 SRS context.

4 DR. TAULBEE: I would like to know
5 what your comments or your concerns are
6 associated with it.

7 DR. MAKHIJANI: Well, our main
8 person who has reviewed this is not on the
9 line, but in the Mound context it came up that
10 there were a lot of different ST, stable
11 tritium compounds that needed to be reviewed,
12 and the context with which you would apply
13 those dose reconstruction practices, and
14 whether they were type M or type S, and
15 whether the doses were reasonable once you
16 tried to use tritium monitoring data and
17 escalated the doses.

18 Jim was part of that discussion.

19 DR. NETON: Yes. I guess we just
20 need to know, I mean, Tim, is there any
21 evidence that there were these special highly-
22 insoluble compounds of tritium in existence at

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1 Savannah River?

2 DR. TAULBEE: No. Most of the
3 tritium compounds, the metal hydrides at
4 Savannah River were in the processing. So you
5 are looking at lanthanum, nickel tritides,
6 palladium tritides, titanium tritides, uranium
7 tritides, all for storage beds, for shipping
8 canisters of tritium, purification steps and
9 the process to try to refine tritium. So they
10 used quite a few metal hydrides, tritides, if
11 you will.

12 The presence of the stable S
13 class, no, these are mostly in the M category.

14 Now have we gone through and checked all of
15 them to make sure that they're all in the M
16 category? I have not yet. But that's
17 something that we can certainly do, and we do
18 know what the major tritides were and used in
19 the processes there. So we can simply check
20 these metal hydrides.

21 I guess this is one of the
22 discussions that we had talked about, that

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1 these, if there's a bioassay or an ICRP model
2 or a particular material that's a hydride,
3 like palladium, for example, palladium
4 hydride, I actually don't believe that there's
5 any difference of how palladium hydride would
6 react in the body versus palladium tritide
7 from that standpoint.

8 DR. NETON: Although there are
9 some dosimetric issues.

10 DR. TAULBEE: Dosimetric issues.
11 But whether it's M class or S class, that
12 should follow the same --

13 DR. NETON: Well, the key issue
14 here is, are there very insoluble forms of
15 tritium, such as hafnium tritide, present at
16 Mound, where one would -- it's the big
17 difference where you would end up with a
18 huge -- if you assume that all the bioassay
19 excreted, all the tritium excreted was due to
20 hafnium tritide, you would end up with these
21 very large intakes, which is what we're
22 struggling with at Mound right now.

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1 CHAIRMAN GRIFFON: Right.

2 DR. MAKHIJANI: Which is
3 implausible because most exposure -- or may be
4 implausible for some workers we are
5 discussing.

6 CHAIRMAN GRIFFON: Yes, yes, yes.

7 DR. NETON: Most of these are
8 accountable, from what I have seen.

9 DR. MAKHIJANI: So I guess we
10 would need to go back and evaluate whether
11 there was potential for exposure to these very
12 insoluble forms of hafnium tritide at SRS.

13 DR. NETON: Hafnium, no.

14 CHAIRMAN GRIFFON: So you are not
15 predicting a special coworker model for this?
16 You're predicting that the TIB-0066 approach
17 will be used?

18 DR. TAULBEE: That's correct.

19 CHAIRMAN GRIFFON: All right.

20 DR. TAULBEE: That's correct.

21 CHAIRMAN GRIFFON: There were a
22 couple of unique ones, I think, in the paper

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1 that you -- that paper is posted on the O:
2 drive as well, right?

3 DR. TAULBEE: Absolutely, yes.

4 CHAIRMAN GRIFFON: It covers the
5 operations, tritide operations over the
6 history of SRS, and there's one that the metal
7 name -- I can't remember it now, but it was a
8 unique blend of metals.

9 DR. TAULBEE: Well, it's a calcium
10 unique blend --

11 CHAIRMAN GRIFFON: Right, right.

12 DR. TAULBEE: And that's one that
13 we should look at and we'll need to.

14 CHAIRMAN GRIFFON: Right, right.

15 MS. ROBERTSON-DEMERS: This is
16 Kathy Robertson-DeMers. Can I ask a question
17 related to the tritide issue?

18 CHAIRMAN GRIFFON: Sure, Kathy.
19 Go ahead -- with caution.

20 (Laughter.)

21 MS. ROBERTSON-DEMERS: Yes, I
22 know.

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1 (Laughter.)

2 How much consideration has been
3 given to diffusion reactivity
4 absorption/desorption in the facilities,
5 including facilities that handled basically
6 large quantities of tritium, say in reactor
7 coolant?

8 DR. TAULBEE: So what you are
9 talking about is basically like an iron
10 tritide type of scenario? Is that correct,
11 Kathy?

12 MS. ROBERTSON-DEMERS: Stainless
13 steel, any rust, dust, that type of thing that
14 could be formed as a byproduct of using large
15 quantities or having large quantities of
16 tritiated gas --

17 DR. TAULBEE: I understand.

18 MS. ROBERTSON-DEMERS: -- and HTO.

19 DR. TAULBEE: Well, that's where I
20 believe that, you know, in looking at the
21 OTIB-0066, and I think the devil is in the
22 details; it comes down to where to apply it

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1 and to which materials in which areas we end
2 up applying it. That, I believe, is really
3 the application of OTIB-0066.

4 DR. MAKHIJANI: Yes, I mean Jim
5 has been part of the discussion and is more
6 part of it, you know, because I just came
7 during the last meeting. So I would look to
8 you as to how much, and Mark, as to how much
9 we should do now or whether NIOSH should look
10 at it now, or how you want to proceed with it.

11 CHAIRMAN GRIFFON: Well, I think,
12 at the very least, you should probably
13 consider the paper that's out there. Is there
14 anything else that describes the tritide
15 operations at Savannah River?

16 DR. TAULBEE: There are several
17 papers --

18 CHAIRMAN GRIFFON: Yes.

19 DR. TAULBEE: -- discussing the
20 nickel as well as the palladium tritide --

21 CHAIRMAN GRIFFON: Yes.

22 DR. TAULBEE: -- the work that was

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1 done there for purification and processing of
2 tritium.

3 So they are more individual-
4 specific, and I can't remember all of them
5 that were mentioned in the paper that I gave
6 you.

7 CHAIRMAN GRIFFON: Yes.

8 DR. TAULBEE: I know there's a
9 large number mentioned in that paper --

10 CHAIRMAN GRIFFON: Right.

11 DR. TAULBEE: -- of their
12 different tritides.

13 DR. NETON: So were these fairly
14 discrete operations, small operations, where a
15 handful of people may have been exposed to
16 these metal tritides versus --

17 DR. TAULBEE: No, no. This is
18 huge.

19 DR. NETON: Okay.

20 DR. TAULBEE: One of the best ways
21 to store tritium is as a metal hydride.

22 DR. NETON: Right.

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1 DR. TAULBEE: You can reduce
2 pressure and you don't have to have rigorous
3 pressure vessels. So they would store tritium
4 as a metal hydride.

5 DR. NETON: Right.

6 DR. TAULBEE: So that was part of
7 their processing and storage and shipping.

8 What Kathy is bringing up is
9 contamination type of levels.

10 CHAIRMAN GRIFFON: Right, right.

11 DR. NETON: Yes, I understand that
12 aspect, but it seems to me, if these were
13 storage-type situations, where is the exposure
14 potential? I mean they weren't manufacturing
15 these, is that right? They were just
16 receiving -

17 DR. TAULBEE: Well, they would
18 receive the bed, you know, a big uranium bed.

19 They would load it up with tritium. They had
20 a half-life effectively. Well, I shouldn't
21 say -- they have a shelf life, let's say.

22 DR. NETON: Yes, right. Yes.

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1 DR. TAULBEE: Periodically, you've
2 got to cut them out. So construction trades
3 workers would go in and --

4 DR. NETON: Okay. So there was
5 potential for exposure?

6 DR. TAULBEE: Absolutely.

7 DR. NETON: But it seems like this
8 is somewhat different than the Mound
9 situation, where we have an extreme scenario
10 where you have a handful of workers
11 potentially exposed to extremely insoluble
12 form of these metal tritides, specific hafnium
13 compound, where here it would not be
14 implausible that, if a large number of people
15 were exposed to these intermediate solubility
16 compounds, we would pick the intermediate
17 solubility or the most soluble, whichever gave
18 the higher dose.

19 DR. TAULBEE: Exactly.

20 DR. NETON: That seems consistent
21 with what we have done for a lot of other
22 applications.

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1 MS. ROBERTSON-DEMERS: This is
2 Kathy Robertson-DeMers.

3 I don't want to see you guys
4 forget about reactivity and diffusion into
5 products, and all doing evasive work on
6 maintenance systems, and so on and so forth,
7 particularly because the reactors used heavy
8 water, and that created a lot of HTO.

9 I think that you need to at least
10 look at the possibility or the probability
11 that those compounds were formed and what kind
12 of exposure individuals were likely to receive
13 because, unlike the tritium facilities where
14 things were in glove boxes, at the reactor
15 this was a more open process, meaning that
16 people came in contact with tritium a lot more
17 often than in a contained system.

18 DR. TAULBEE: Kathy, what I think
19 Jim has indicated here is that we would be
20 considering those, especially some of the
21 metal, like stainless steel-type tritides or
22 iron tritides. Certainly, a lithium tritide

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1 would be considered there around the reactor
2 areas.

3 So, you know, what Jim is saying,
4 since this is such a relatively large
5 population, we would compare for the
6 particular individual which dose model we
7 would use, one for a tritide, like M class
8 solubility, or we would assume regular
9 tritium, and whichever would end up being more
10 claimant-favorable, that's what we would
11 assign.

12 MS. ROBERTSON-DEMERS: Okay. That
13 wasn't coming through to me in the way that
14 Jim was focusing on the production areas.

15 DR. TAULBEE: Okay.

16 CHAIRMAN GRIFFON: So I guess the
17 only action item I could see right now at this
18 standpoint is to have SC&A review the
19 documents that are out there regarding the
20 production, the different source terms, and
21 make sure, you know, comment on whether
22 TIB-0066 is appropriate, right? Right.

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1 Because, like you said, Tim, there
2 are a few oddball ones in there that I think
3 should be at least looked at. I would make
4 that an SC&A action for follow-up, yes.

5 DR. TAULBEE: We can do that.

6 CHAIRMAN GRIFFON: Anything else
7 on that for now?

8 (No audible response.)

9 Okay, let's try to get through, we
10 might make it through the internal before
11 lunch.

12 (Laughter.)

13 Eleven, I think we covered, unless
14 there is something else in there.

15 DR. MAKHIJANI: Yes, well, we kind
16 of eventually have covered 11, but this is
17 sort of off the periodic table problem that we
18 encountered at Y-12.

19 And the reason I kind of wrote
20 about it was that there is this issue of
21 incidents. Hearing Tim talk about what
22 incidents were recorded in the special

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1 investigations, hazard investigations, led by
2 financial damage and work hours lost -- yes, I
3 was going to include that.

4 The radiological question arises
5 as to, you know, in this context, if financial
6 implications and work-hour implications were
7 low, do we have reports on any incidents that
8 might have happened? I mean these were pretty
9 extensive operations, to see whether we have
10 the data and whether your fission product --
11 so that is one thing.

12 B, whether your fission product
13 data would be sufficient to cover with -

14 DR. TAULBEE: There was also a
15 dose limit as well, to where if a person
16 exceeded a quarterly type of exposure, that
17 would be in a special hazard incident
18 investigation as well.

19 DR. MAKHIJANI: Okay.

20 DR. TAULBEE: So there was a dose
21 limit there as well.

22 One other thing that I would like

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1 to point out with regard to other incidents,
2 if you look at the works technical reports, we
3 captured all of the health physics sections
4 from start-up of 1953 all the way through, I
5 believe, 1981.

6 In the health physics section,
7 there is on a monthly basis discussions of
8 incidents in those particular reports, and
9 they would bring out details as far as what
10 happened and what the dose levels were and
11 what the follow-up was. That is reported on a
12 monthly basis in all of those reports,
13 separated by area 200 HF, 300 area, 700 area,
14 et cetera.

15 So there are numerous incidents
16 listed there within those reports that didn't
17 make it to the SHI type of level for formal
18 reporting and investigation.

19 The exotic radionuclide, one of
20 them that you've got mentioned here is Tm-170,
21 a pure beta-emitter. You're absolutely right,
22 that would not be picked up by a whole body

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1 count, but it would be by the fission product
2 bioassay, fission and activation product
3 bioassay, because it was a direct mounting
4 method and counted via gas proportional. So
5 that is how those types of incidents with
6 monitoring would be picked up.

7 Sorry, Jim.

8 DR. NETON: That is okay. It just
9 seems to me that these incidents need to be
10 judged in the context of the robustness of the
11 coworker models that we have professionally
12 produced because, if those models cannot
13 demonstrate that they had some sort of routine
14 monitoring going on for these operations, then
15 it is true that you could have incidents that
16 occur that went undetected, much like sort of
17 how we ended up at the Nevada Test Site.

18 But you also have to go back,
19 then, and look at the health physics program
20 documentation that support the monitoring
21 programs to see if the controls were
22 sufficient that the monitoring might not have

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1 even been needed. I don't know. So we need
2 to look at that from the full perspective, the
3 monitoring programs that were in place and how
4 well we can document that, and then the
5 supporting documentation for those programs.

6 DR. MAKHIJANI: Yes, I agree with
7 that.

8 I don't know. Mark, basically, I
9 guess the answer is we should wait for the
10 coworker models.

11 CHAIRMAN GRIFFON: The coworker
12 models on that, yes. I don't think there's
13 any action on that other than the coworker
14 models.

15 DR. MAKHIJANI: Yes.

16 CHAIRMAN GRIFFON: And Number 12,
17 I think we might have covered this one
18 already, too, the incidents stuff. Is there
19 anything that we missed, Arjun, just to go
20 over this?

21 DR. MAKHIJANI: Give me just one
22 second.

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1 CHAIRMAN GRIFFON: Yes.

2 DR. MAKHIJANI: Yes, so this --
3 yes --

4 CHAIRMAN GRIFFON: This is the
5 question of reviewing the perceived protocol.

6 DR. MAKHIJANI: I would just
7 request, Tim, you know, look at the list of
8 incidents in the TBD review that we did
9 because there are a number of what we thought
10 were pretty serious incidents.

11 CHAIRMAN GRIFFON: Based on that
12 protocol, to see if they should have been --

13 DR. MAKHIJANI: Yes, now we would
14 look at the protocol, of course.

15 CHAIRMAN GRIFFON: Right.

16 DR. MAKHIJANI: But it would be
17 helpful -- there are not many. I mean there
18 are maybe half a dozen of them.

19 CHAIRMAN GRIFFON: Yes, okay. And
20 you all will look at the protocols as well?

21 DR. MAKHIJANI: We will definitely
22 look at the protocols.

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1 CHAIRMAN GRIFFON: Right.

2 DR. MAKHIJANI: But I'm just
3 saying it would be helpful to compare notes.

4 CHAIRMAN GRIFFON: Yes, yes.

5 Okay. And Number 13, I think --

6 DR. MAKHIJANI: We've covered
7 Number 13.

8 CHAIRMAN GRIFFON: -- we covered
9 this, and we are waiting for the report,
10 right.

11 DR. NETON: I think there are
12 issues. So it is not entirely correct.

13 CHAIRMAN GRIFFON: That was the
14 issue --

15 DR. NETON: So it does not contain
16 an analysis of --

17 DR. MAKHIJANI: I agree. I agree
18 that the issue description --

19 CHAIRMAN GRIFFON: Okay.

20 DR. MAKHIJANI: This was written
21 from memory, and my memory was not entirely
22 accurate.

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1 DR. NETON: We need to fix issue
2 13 and issue an amended new matrix.

3 CHAIRMAN GRIFFON: Yes. Okay.
4 And let's see, we've got a few minutes. Let's
5 get to -- it goes on.

6 MEMBER LOCKEY: What's that?

7 CHAIRMAN GRIFFON: I thought we
8 were close to the end of the internal dose
9 issues.

10 DR. MAKHIJANI: Number 14 is the
11 internal.

12 CHAIRMAN GRIFFON: Number 14.

13 DR. MAKHIJANI: This is a sort of
14 an environmental dose issue, arguably, and we
15 had also raised this, and I think you agreed,
16 if I recall correctly. Yes, it is in Section
17 510. It should say, BPD review, not DBS
18 review.

19 As I understand the NIOSH model
20 for environmental exposures, it is basically
21 stack releases and dispersion modeling, and
22 that's how you ascribe the doses. We kind of

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1 criticized that and said that, while that is
2 one component of it, that's not possibly the
3 biggest component of it, and maybe dispersion
4 modeling is not adequate for onsite exposure
5 models.

6 So there are two components to the
7 criticism. I think the most serious one
8 really relates to this kind of, what I call
9 special exposure conditions there, such as the
10 one that I could remember as an illustration
11 that we covered was this open-pen burning of
12 contaminated tributyl phosphate in the burning
13 problem, where you would have a lot of smoke
14 and inhalation, potential inhalation.

15 Can you address the internal
16 health implication of that?

17 DR. TAULBEE: When I was reviewing
18 some of the notes in preparation for this, I
19 ran across that there had been a discussion
20 between John Mauro and Gene Rollins, and there
21 had been some agreement reached on this.

22 DR. MAKHIJANI: Oh, this part I'm

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1 not recalling.

2 DR. TAULBEE: Is John Mauro on the
3 phone?

4 MR. KATZ: John Mauro, are you
5 with us on the phone?

6 (No audible response.)

7 CHAIRMAN GRIFFON: Apparently not.

8 DR. TAULBEE: Okay. I think we
9 should probably follow up on that just to find
10 out what both of them remember from that
11 discussion three years ago.

12 DR. NETON: What kind of note was
13 this, Tim?

14 DR. TAULBEE: This was in -- where
15 Judson recently pulled together kind of where
16 we were at with the TBD review and the issues
17 matrix. He put an indication on there that
18 John Mauro and Gene Rollins had discussed this
19 issue, and Gene had revised and rewritten part
20 of the TBD to cover the open burning.

21 CHAIRMAN GRIFFON: I don't recall.
22 I mean I don't recall. Would that be in 4-e,

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1 in that revision?

2 DR. MAKHIJANI: Could you give us
3 your sort of research on this that went back
4 and the discussion and the reference? So
5 maybe it is in a transcript or something. So
6 we don't have to go repeat your whole research
7 to find it.

8 CHAIRMAN GRIFFON: Yes, right.

9 DR. MAKHIJANI: Then I will
10 certainly talk to John Mauro about this.

11 CHAIRMAN GRIFFON: Okay. Is this
12 a question mainly of your concern over the
13 environmental dose models, though?

14 DR. TAULBEE: Yes.

15 CHAIRMAN GRIFFON: Okay.

16 DR. MAKHIJANI: And then there's
17 the whole monitored/unmonitored. You know --

18 CHAIRMAN GRIFFON: Right.

19 DR. MAKHIJANI: -- it kind of
20 fades into the question because these would be
21 episodic exposures.

22 CHAIRMAN GRIFFON: Yes.

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1 DR. MAKHIJANI: There's not
2 burning going on all the time. Who was there?
3 How do you identify them?

4 It seems to me, unmonitored
5 workers, you know, the assumption is
6 unmonitored workers are not at risk of high
7 exposure, but plutonium-contaminated solvent
8 of being burned over there.

9 DR. NETON: If you were a worker
10 out there burning materials, I don't think you
11 would just get environmental exposures. You
12 would probably end up getting the coworker
13 model for uranium.

14 CHAIRMAN GRIFFON: That's what I
15 was getting at.

16 DR. NETON: Presumably, the
17 workers --

18 CHAIRMAN GRIFFON: Right. If they
19 could show they were doing that kind of work,
20 then they should be put in the regular
21 coworker model, right, not the environmental?
22 Right. But, still, you want to check and see

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1 if that is bounding, I guess, of these
2 situations.

3 Yes, go ahead.

4 DR. TAULBEE: Issue Number 25 is
5 specifically talking about the burning ground
6 and the particular issue.

7 DR. MAKHIJANI: Oh, did it come up
8 twice? I don't remember.

9 DR. TAULBEE: So I am wondering if
10 25 and 14 are effectively the same issue,
11 that --

12 CHAIRMAN GRIFFON: For external
13 and internal? Is that what --

14 DR. TAULBEE: It's environmental
15 dose.

16 CHAIRMAN GRIFFON: Oh,
17 environmental, yes.

18 DR. TAULBEE: And it is talking
19 about the dispersion modeling, and so forth.

20 CHAIRMAN GRIFFON: It seems like
21 it belongs more in the environmental, yes.

22 DR. MAKHIJANI: Yes, the example

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1 given in 17 is definitely -- or I forgot the
2 number already --

3 DR. TAULBEE: Fourteen.

4 DR. MAKHIJANI: -- or 14 is an
5 environmental dose model. I cannot remember
6 if there were any other special exposure
7 conditions. I was thinking, but maybe from
8 the tank farm databank, yes, I think there
9 were sort of work-related exposure conditions
10 like spills with cleanup crews and things
11 like --

12 CHAIRMAN GRIFFON: Maybe you can
13 flush out 14 a little better, so we have a
14 better example there as to if you think they
15 are two distinct, yes.

16 DR. MAKHIJANI: See, I would be
17 hard-pressed to envision assigning a
18 construction worker an environmental dose
19 unless it was clearly evident that he never
20 entered a radiological area.

21 CHAIRMAN GRIFFON: Well, that was
22 my point. If this is environmental, it might

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1 be a site profile issue, you know, but, yes,
2 if there's other instances though --

3 MEMBER LOCKEY: How do you bound
4 an unauthorized work practice? How do you do
5 that?

6 DR. NETON: Unauthorized? Do you
7 mean dispersion of the --

8 MEMBER LOCKEY: You say burning of
9 the tributyl phosphate, that's an
10 unauthorized --

11 DR. MAKHIJANI: No, I don't think
12 it was unauthorized. I think it was done as a
13 matter of routine until 1970, to my knowledge.

14 MEMBER LOCKEY: Well, you said
15 off-normal or unauthorized work practice.

16 CHAIRMAN GRIFFON: Yes, it does
17 say that.

18 DR. MAKHIJANI: Oh, yes, that's
19 true.

20 MEMBER LOCKEY: You said that. So
21 how do you bound an unauthorized work
22 practice? You did say that.

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1 DR. MAKHIJANI: Yes. No, I think
2 I have conflated several things in this
3 statement. You are quite right, it is all
4 kind of several clauses that seem to be
5 related, but I don't think in my mind they are
6 related because I don't think the burning of
7 spent tributyl phosphate was unauthorized.
8 I'm not sure. I would like to go back and
9 look.

10 CHAIRMAN GRIFFON: Yes, look at
11 that.

12 DR. NETON: Interestingly, the
13 history and current status of 25 does say that
14 NIOSH was to perform an evaluation of over-pen
15 burning of solvents as part of the TBD comment
16 resolution. That is consistent with what Tim
17 just said.

18 CHAIRMAN GRIFFON: Yes.

19 DR. NETON: And the comment here
20 seemed to be that the ER contains no
21 discussion of this, which I think is valid as
22 well. So we need to locate that evaluation of

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1 open-pen burning of solvents that we have
2 already done and put that on the table.

3 DR. MAKHIJANI: I will go back and
4 fix Item 14, make it more clear.

5 CHAIRMAN GRIFFON: Yes. Okay.

6 MEMBER LOCKEY: Well, let me go
7 back to that term. Were there unauthorized
8 work practices that you are --

9 CHAIRMAN GRIFFON: Or are workers
10 alleging that the --

11 MEMBER LOCKEY: That have been
12 documented? That have been documented?

13 DR. MAKHIJANI: I don't recall at
14 this time. I think we covered this in our TBD
15 review. That is probably where this came
16 from.

17 I will have to go back and see
18 what examples we gave.

19 CHAIRMAN GRIFFON: Because off-
20 normal is certainly unauthorized, yes. So if
21 you would do that --

22 DR. MAKHIJANI: Yes, and I know

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1 that when we were initially doing TBD reviews
2 in 2004 and 2005, we used to look into this
3 and it came up during interviews and we gave
4 examples in more than one TBD review of this.

5 So I will have to go back and see
6 what we said and straighten --

7 MEMBER LOCKEY: Clarify it.
8 Clarify it.

9 DR. MAKHIJANI: This is too short
10 and possibly confusing. I will definitely
11 clarify it.

12 DR. NETON: But the fact that it
13 is an unauthorized work practice doesn't
14 necessarily mean that we can't bound it
15 because --

16 DR. MAKHIJANI: No.

17 DR. NETON: -- if it was
18 monitored, for instance, even though it was
19 unauthorized, then we can put some limits on
20 it.

21 CHAIRMAN GRIFFON: Yes, or even if
22 it is not monitored but you can describe it

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1 and know what it was --

2 DR. MAKHIJANI: Or we can describe
3 it and bound it --

4 CHAIRMAN GRIFFON: Yes, and bound
5 it.

6 DR. NETON: The only unauthorized
7 work practices that would be of concern is if
8 they didn't monitor someone who should have
9 been monitored, I suppose.

10 CHAIRMAN GRIFFON: Right.

11 DR. NETON: But if the workers
12 were monitored or we have access to documents
13 that say what the exposure potentials were, we
14 could reconstruct those work practices,
15 exposure from those work practices.

16 DR. MAKHIJANI: Yes, I don't
17 disagree with that.

18 CHAIRMAN GRIFFON: You could have
19 unauthorized work practices that went on, as
20 long as you can -- well, I think I'm saying,
21 if you can define the source term more or
22 less, and you can say there's no way we can't

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1 bound this with the operational coworker
2 model, you know --

3 DR. NETON: If all these workers
4 were on routine uranium bioassay programs for
5 the duration of employment, and there were
6 some unauthorized work practices using
7 uranium --

8 CHAIRMAN GRIFFON: It's going to
9 be picked up.

10 DR. NETON: -- interspersed, it
11 would be picked up as part of that routine
12 monitoring program.

13 CHAIRMAN GRIFFON: Right.

14 MEMBER LOCKEY: Unless you know
15 what that unauthorized practice was.

16 DR. NETON: No, it really doesn't
17 matter.

18 CHAIRMAN GRIFFON: Or what
19 radionuclide was involved.

20 DR. NETON: Yes, if you know the
21 radionuclide, as long as you know what they're
22 working with.

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1 CHAIRMAN GRIFFON: Right, right,
2 right, yes.

3 DR. MAKHIJANI: Yes, and just as
4 an explanation, as I said in the beginning,
5 the way this matrix was put together was I did
6 look at the TBD matrix items. I didn't read
7 our whole -- I think our TBD review is more
8 than 200 pages. I did not reread the whole
9 thing.

10 I picked out items that had not
11 been resolved that I could see. It was more
12 obviously for each one --

13 CHAIRMAN GRIFFON: That is fine.

14 DR. MAKHIJANI: But I picked out
15 items that I felt hadn't been resolved and put
16 them in here, so that we could make sure.

17 CHAIRMAN GRIFFON: That is fine.

18 DR. MAKHIJANI: There is no claim
19 that this will result in an SEC. It is just
20 that it needs to be resolved in this context.

21 CHAIRMAN GRIFFON: Okay. I might
22 try to take on one more before we break for

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1 lunch. We are going to break for lunch in a
2 few minutes, if you are on the phone wondering
3 when.

4 But Number 15, this job type
5 question, I think Tim might have sort of
6 covered this already.

7 DR. MAKHIJANI: Yes, 15 and 16 are
8 actually kind of together. They will be
9 covered in the review that you will soon get.

10 CHAIRMAN GRIFFON: It's
11 construction worker versus non-construction
12 worker questions, right?

13 DR. MAKHIJANI: Yes. Well, within
14 construction -- no, it's a construction --
15 within construction worker, if you look at
16 areas and job types, so the analysis we did
17 was comparing construction and non-
18 construction, and within construction workers,
19 we compared areas, and to a much more limited
20 extent job types are there, large differences
21 between job types.

22 But job types I think we only

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1 looked at tritium so far.

2 MEMBER LOCKEY: Difference in job
3 types for construction workers?

4 MR. KATZ: Yes.

5 DR. MAKHIJANI: Like pipefitters
6 and electricians.

7 CHAIRMAN GRIFFON: Arjun, can you
8 explain this last, in Number 15, the very end
9 there?

10 The petition raises the issue of
11 especially hazardous working conditions. See,
12 for instance, Affidavit Number 12. I'm not
13 familiar -- do you recall what that --

14 DR. MAKHIJANI: Well, I don't
15 recall offhand what Affidavit Number 12 is.

16 CHAIRMAN GRIFFON: Okay. I'll
17 just draw --

18 DR. MAKHIJANI: You know, I didn't
19 go back and review the affidavits in preparing
20 for this.

21 CHAIRMAN GRIFFON: That's fine. I
22 thought, since you referenced it, you might

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1 have. Okay.

2 DR. MAKHIJANI: Yes. I prepared
3 this like six months ago.

4 CHAIRMAN GRIFFON: That's okay.
5 We will leave -- I think that's good at that
6 point.

7 Really, it goes back to your
8 report that's going to --

9 DR. MAKHIJANI: Yes, 15 and 16, I
10 think --

11 CHAIRMAN GRIFFON: Yes, yes.
12 Okay.

13 DR. MAKHIJANI: -- we've covered
14 at some length.

15 CHAIRMAN GRIFFON: All right. I
16 think this might be a good break point. We
17 didn't quite get through internal, but I was
18 trying.

19 DR. MAKHIJANI: Yes, I think we
20 did.

21 DR. NETON: I think we did, yes.

22 CHAIRMAN GRIFFON: Oh, 17 and 18?

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1 DR. MAKHIJANI: It was the last
2 internal item.

3 MEMBER LOCKEY: The
4 construction/non-construction work
5 differences, you're going to sit down side by
6 side with the spreadsheets? So that's how
7 that is going to be resolved? Is that the
8 step forward on that?

9 DR. NETON: Well, we need to
10 review their report that we haven't seen yet.

11 DR. MAKHIJANI: There are two
12 items, Jim. We have a completed report that
13 is a text document with graphs and tables, and
14 so on. So you will get the basic numbers.
15 The underlying spreadsheets, as Steve said, we
16 have to do some fixing and explanation, so
17 they are more transparent.

18 CHAIRMAN GRIFFON: I am sorry. On
19 the other side, we have TIB-0052 has NIOSH's
20 Savannah River analysis, right?

21 DR. MAKHIJANI: Yes. Now I have
22 to go back --

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1 CHAIRMAN GRIFFON: At least we're
2 presuming, right, right.

3 DR. MAKHIJANI: Now I have to go
4 back because that was my screw-up, that I
5 didn't remember that right.

6 CHAIRMAN GRIFFON: Yes.

7 DR. MAKHIJANI: And I have to go
8 back to Steve and our earlier analysis and
9 read it or something, and revisit that and see
10 what happened there.

11 CHAIRMAN GRIFFON: But I think, as
12 we move on with that item, which obviously is
13 going to be pretty extensive, I think one
14 thing that I am confused on, and it may add
15 confusion down the line, is that I think the
16 data that SC&A assessed is different than the
17 data that NIOSH assessed.

18 DR. TAULBEE: Oh, yes.

19 CHAIRMAN GRIFFON: Because you
20 used only claimant data.

21 DR. TAULBEE: Yes.

22 CHAIRMAN GRIFFON: And they used

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1 the database.

2 DR. TAULBEE: We start with the
3 claimant data, and when it's insufficient,
4 then we supplement.

5 CHAIRMAN GRIFFON: Right, right.

6 DR. NETON: But for TIB-0052, we
7 actually turned out 18 with plutonium
8 urinalysis.

9 DR. MAKHIJANI: Do we have that?

10 DR. NETON: I believe you do.

11 CHAIRMAN GRIFFON: If we can get
12 the raw data, the sort of analytical --

13 DR. NETON: I think, as part of
14 the TIB-0052 review, we made it available.

15 CHAIRMAN GRIFFON: I think you
16 did, too. I recall asking because I always
17 ask for that stuff, yes.

18 DR. NETON: Because this is
19 critical.

20 CHAIRMAN GRIFFON: Yes.

21 DR. NETON: I mean Dr. Lockey
22 makes a good point. We have sort of

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1 approached this, as you could see so far, with
2 sort of the assumption that, if we can bound
3 production workers' doses, we can bound
4 construction workers' doses, because
5 primarily, as we thought in TIB-52, we
6 demonstrated, at least for plutonium, that
7 that's the case, that there was no evidence
8 that construction trades workers were more
9 highly exposed internally than production
10 workers. So, if there are these differences
11 that SC&A was just pointing out, we need to
12 look at those.

13 DR. MAKHIJANI: Based on claimant
14 data, there are some.

15 DR. NETON: Right. So we need to
16 look through that. It's very important.

17 MEMBER LOCKEY: Based on claimant
18 data, you mean based on dose reconstruction
19 claimant data?

20 DR. MAKHIJANI: No. No, no.

21 CHAIRMAN GRIFFON: No.

22 DR. MAKHIJANI: The data that

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1 we're looking at, Jim, are all the claimants,
2 all the people who have filed claims. Their
3 bioassay data was compiled in spreadsheets for
4 the purpose of doing coworker models, which
5 that data is now being supplemented, which I
6 did not know before.

7 But what we have accessible to us
8 at the present is all of the claimant data by
9 radionuclide and date, and so on. And since
10 there is claimant data, we can also, well,
11 they are identifiable. So we can also
12 identify the job type and the work areas, and
13 so on.

14 So that is what we have analyzed,
15 not the dose reconstructions.

16 MEMBER LOCKEY: I've got you.
17 Okay.

18 MEMBER GIBSON: But the issue of
19 the construction workers being the highest
20 dose could be true at Savannah River, but
21 that's not accepted practice everywhere at
22 every site.

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1 CHAIRMAN GRIFFON: No, I think
2 that is the question on the table. They are
3 saying that it might be true for some
4 radionuclides, but other sites, no. Savannah
5 River is pretty unique.

6 MEMBER GIBSON: Yes.

7 CHAIRMAN GRIFFON: Yes.

8 MEMBER GIBSON: We had
9 jurisdictional battles about the Davis-Bacon
10 Act, and they let us bring construction
11 contractors in, but when it came to doing hot
12 work or dirty work, they pulled them off, and
13 the plant people can do it.

14 CHAIRMAN GRIFFON: It's a site-
15 specific question, yes.

16 MEMBER GIBSON: Sure.

17 MEMBER CLAWSON: Savannah River
18 was a very different site from any of these
19 other ones.

20 DR. MAKHIJANI: Yes, that is true.
21 As Brad said, that came out when we were
22 there, and Brad was part of the ending

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1 routine.

2 But the other thing is it's not
3 uniformly so, that construction workers are
4 generally more exposed. It is sometimes so
5 with some construction worker area job types
6 and sometimes it's not.

7 MEMBER LOCKEY: Now you're talking
8 about Savannah River?

9 DR. MAKHIJANI: Savannah River,
10 yes.

11 MEMBER LOCKEY: Okay.

12 MEMBER CLAWSON: Then you get into
13 classification issues there, too.

14 CHAIRMAN GRIFFON: We will have
15 plenty more time to discuss this once we get
16 SC&A's report, too, so we can see the details
17 on this.

18 If it's okay, I'm ready for a
19 lunch break. We can come back at 1:00. I
20 think we can do 1:00.

21 MR. KATZ: Thank you, everybody on
22 the line.

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1 CHAIRMAN GRIFFON: You can't go
2 far.

3 (Laughter.)

4 MR. KATZ: And we'll be back,
5 then, at about 1:00.

6 (Whereupon, the above-entitled
7 matter went off the record for lunch at 12:06
8 p.m. and resumed at 1:07 p.m.)

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1 moved -- well, it was the Gene Rollins issue,
2 right? I think we've moved past it, John. We
3 will follow up with you later on it.

4 DR. MAURO: Very good.

5 CHAIRMAN GRIFFON: Arjun can fill
6 you in.

7 DR. MAKHIJANI: Yes. I have notes
8 on it, John.

9 CHAIRMAN GRIFFON: Yes.

10 DR. MAURO: Okay. Very good.
11 Sorry about that.

12 MR. KATZ: Thank you. Thank you,
13 John. It's no problem.

14 CHAIRMAN GRIFFON: Okay. For
15 those on the phone, we are starting with, on
16 the matrix, comment Number 17, which starts
17 off with the external dose issues. We will do
18 the same format. That seems to work fine.
19 That is, let SC&A introduce the issue and then
20 we will discuss.

21 DR. MAKHIJANI: Yes, this item is
22 partly geared off of NIOSH's exploration of

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1 N/P ratios. I think the basic status, at
2 least up through 1951, we're awaiting your
3 report on.

4 DR. TAULBEE: Absolutely. If you
5 want, I will go ahead and fill you in on where
6 we're at with this.

7 CHAIRMAN GRIFFON: Yes.

8 DR. TAULBEE: Okay. We have
9 broken the neutron exposures into two
10 different time periods, prior to 61 and post-
11 1961. This has largely to do with the amount
12 of personal monitoring data that is available
13 in the latter time period there, post-1961.

14 So what we have done is we have
15 focused our data capture efforts on collecting
16 both photon and neutron survey data, so that
17 we can evaluate the N/P ratio that we apply
18 there at the site.

19 Based upon our current evaluation
20 or what we were able to do during the
21 evaluation report, there didn't seem to be any
22 particular immediate information that would

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1 refute the values that we use in the Technical
2 Basis Document at this time.

3 However, we concurred that those
4 N/P ratios were developed using limited data,
5 and we felt that further investigation was
6 warranted, that it was appropriate to do so.

7 So what we have been doing this
8 past year, in January and then in April and
9 May and July, we have been collecting this
10 data. We have had the site pull back
11 typically 30 to 50 boxes of radiation survey
12 records, and we have gone through and
13 extracted the neutron measurements as well as
14 the photon measurements for a particular
15 operation or a cabinet, a glove box, if you
16 will, et cetera.

17 So we are in the process of coding
18 that particular data at this time. The data
19 coding is underway for the 200 and 300, 700
20 areas. So that is currently progressing.

21 Once the 200 area data is coded,
22 then we will start on the 100 area data. The

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1 200 area was what we captured in January last
2 year. The 300/700 was in the April/May
3 timeframe, and then in July, the 100 area.

4 So that's where we currently are
5 with that particular process. Once we get
6 those data coded, we will, obviously, be
7 putting forward a report. If there's a reason
8 to change the N/P ratios in the Technical
9 Basis Document, we will. And if these confirm
10 what's in the Technical Basis Document is
11 reasonable, then we will use that.

12 So that's where we currently are
13 with this evaluation.

14 Now, Issue Number 18 is closely
15 related to that, and that's the N/P ratio from
16 1962 to 1971.

17 MR. KATZ: Is there a rough
18 timeframe for that? Rough?

19 DR. TAULBEE: Rough?

20 (Laughter.)

21 I am thinking that the 200 area
22 data, we will probably have the report out --

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1 I really don't have a rough at this time, and
2 let me explain why.

3 Because Issue Number 18 is what
4 we're focusing on at this time, it's the 1962
5 to 71 time period is what we are focusing on,
6 during the coding efforts. So since they were
7 just being coded, we really hadn't planned out
8 -- I think the actually current date is
9 sometime in June/July in the Gantt chart for
10 the others, but I could be wrong. I don't
11 know if you have the Gantt close there.

12 MR. KATZ: No, I do not.

13 DR. TAULBEE: Okay.

14 DR. MAKHIJANI: Could I ask a
15 question --

16 DR. TAULBEE: Sure.

17 DR. MAKHIJANI: -- about the data?
18 Do you have any data for construction
19 workers, then?

20 DR. TAULBEE: No, this is purely a
21 workplace area. So these measurements would
22 be taken under routine operations.

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1 DR. MAKHIJANI: All areas?

2 DR. TAULBEE: All areas.

3 DR. MAKHIJANI: So they are area
4 monitoring data?

5 DR. TAULBEE: Yes. Yes, they are.

6 DR. MAKHIJANI: They're not
7 personnel monitoring?

8 DR. TAULBEE: No, this is area
9 monitoring data.

10 DR. MAKHIJANI: Oh, okay. Survey-
11 type data?

12 DR. TAULBEE: Yes, survey data.

13 CHAIRMAN GRIFFON: Survey, yes.

14 DR. TAULBEE: Survey, that's
15 correct.

16 DR. MAKHIJANI: Oh, okay.

17 DR. TAULBEE: Taken with a Hurst
18 neutron meter as well as the Cutie Pie, the
19 ionization chamber. So we are comparing those
20 two ratios together, and that is what we are
21 proposing to assign, is based upon that ratio.

22 DR. MAKHIJANI: So you are going

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1 to determine N/P ratios from -- I'm just
2 trying to understand what you're doing.

3 DR. TAULBEE: Sure.

4 DR. MAKHIJANI: Your N/P ratios
5 from field conditions to be applied to the
6 actual photon dose from the badge?

7 DR. TAULBEE: That is correct.

8 Okay?

9 CHAIRMAN GRIFFON: And then, was
10 that 62 through 71? You were going to discuss
11 that?

12 DR. TAULBEE: Yes.

13 CHAIRMAN GRIFFON: Yes, you might
14 as well go into that one, I guess, now.

15 DR. TAULBEE: Sure. From 62 to
16 71, we have extensive NTA monitoring data for
17 people. And the requirements from the
18 procedures at Savannah River were that, if you
19 entered a radiation or a neutron dose field
20 greater than 1 millirem per hour, you were
21 required to wear the NTA badge or a neutron
22 dosimeter. In latter years, it would be the

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1 thermoluminescent neutron dosimeter.

2 So, if you were in a neutron field
3 less than 1 millirem per hour, you weren't
4 required to be monitored by their procedures
5 at that time. So what we did was we collected
6 all of the NTA monitoring records from the
7 Savannah River Site from 1962 through 1971,
8 and we have gone through and we have coded all
9 of these individual reads of the neutron
10 dosimeters, and there's over 50,000 NTA
11 dosimeter readings that we have in this
12 spreadsheet, effectively. And that is the
13 analysis that we are currently doing.

14 Now what we are doing is we are
15 pairing those NTA measurements up with
16 individual photon measurements on a quarterly
17 basis for all of the workers who were
18 monitored for neutrons. But we recognize that
19 the energy response of the NTA is limited. So
20 we are conducting -- we are developing a
21 correction factor, in order to energy-correct
22 these neutron dosimeters before we develop

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1 this N/P ratio.

2 This, obviously, has to be done by
3 area because the neutron-to-photon ratios or
4 the neutron energy spectra in the 700 area is
5 different than the 100 area and different from
6 the 200 area and different parts of the 200
7 area.

8 So we are developing this by area.

9 We are currently working on that particular
10 report. I do expect that that report will be
11 done by the 1st of March for that correction.

12 So we should be able to get that to you by
13 that time period.

14 CHAIRMAN GRIFFON: So you are
15 pairing these to get N/P ratios, and then the
16 dose of record for the individual is going to
17 be based on the N/P ratio times the photon-
18 measured dose?

19 DR. TAULBEE: Well, it is going to
20 be done one of the two ways. If a person has
21 a complete set --

22 CHAIRMAN GRIFFON: I've got you.

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1 DR. TAULBEE: -- of their neutron
2 data, then we will use their data.

3 CHAIRMAN GRIFFON: But if there's
4 gaps or whatever, then you fill it in?

5 DR. TAULBEE: If there's gaps,
6 then we'll fill it in, that is correct.

7 DR. MAKHIJANI: How are you
8 relating these survey measurements to the
9 source of the photons and the neutrons?
10 Because the measurements are being taken in
11 the workplaces.

12 DR. TAULBEE: Yes.

13 DR. MAKHIJANI: So the sources
14 might be behind the glove box or --

15 DR. TAULBEE: It's actually in
16 different ways.

17 DR. MAKHIJANI: What about the
18 attenuation, the relative attenuation --

19 DR. TAULBEE: We have both. We
20 have both. In some cases, or in most cases,
21 they indicate where the survey was taken. And
22 in some cases, it was taken three inches from

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1 the face of the glove box. In other cases, it
2 was a foot. In some cases, it's three inches
3 from the source material, from the plutonium
4 puck. So we have both, as to what these
5 surveys are indicating.

6 DR. NETON: But wouldn't it be the
7 idea to generate a distribution of these N/P
8 ratios from the field conditions?

9 DR. TAULBEE: That's right.

10 DR. NETON: And then use some kind
11 of bounding analysis based on that? I think
12 that is probably the best thing to do at this
13 point. We have run into problems trying to
14 use N/P ratios off the badges --

15 CHAIRMAN GRIFFON: Right.

16 DR. NETON: -- for reconstructing
17 from the principles.

18 DR. TAULBEE: In the earlier time
19 period, we plan on using the survey data, and
20 from 1962 to 71, we plan on reconstructing it
21 from badges.

22 DR. NETON: With correction

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1 factors?

2 DR. TAULBEE: With correction
3 factor applied to NTA.

4 DR. NETON: Right.

5 DR. TAULBEE: And we expect to
6 finish the 62 to 71 time period first. We are
7 going to work our way backwards.

8 CHAIRMAN GRIFFON: I'm not sure
9 what else really can be done by SC&A until we
10 get the coworker model on the table.

11 DR. MAKHIJANI: No.

12 DR. TAULBEE: Okay, so that's 17
13 and 18.

14 CHAIRMAN GRIFFON: Yes. Number
15 19, this might be different.

16 DR. MAKHIJANI: So do I take it
17 that your current model will cover the test
18 reactor?

19 DR. TAULBEE: Yes.

20 DR. MAKHIJANI: And we had this
21 question of an incident with a reactor come
22 up. I put it arbitrarily under the test

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1 reactor neutron dose. It doesn't really
2 belong under neutron dose. It's a kind of a
3 placeholder there that I want to be sure to
4 bring it up, and whether you're addressing it,
5 what happened. Was there a clean-up? Were
6 there measurements? How severe was the
7 accident? We haven't investigated this.

8 DR. TAULBEE: There was this
9 incident -- can you give me more details?

10 DR. MAKHIJANI: I don't have more
11 details. It came up in one of our interviews,
12 and we have not investigated it further. I
13 don't know whose court that ball is in, but we
14 would be happy to do it, if so directed.

15 CHAIRMAN GRIFFON: And you're sure
16 it was the test reactor?

17 DR. MAKHIJANI: That's what the
18 interviewee said.

19 CHAIRMAN GRIFFON: Because there
20 was another one that had the cracked core,
21 right, at Savannah?

22 DR. TAULBEE: The R-reactor was

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1 getting some cracks on the outer --

2 CHAIRMAN GRIFFON: Right. Outer,
3 yes.

4 DR. TAULBEE: -- tank, if you
5 will, yes.

6 CHAIRMAN GRIFFON: Right.

7 DR. TAULBEE: Which is why they
8 shut it down.

9 CHAIRMAN GRIFFON: Yes.

10 DR. TAULBEE: But I'm not familiar
11 with those --

12 CHAIRMAN GRIFFON: That is why I
13 was wondering if that was confusion over which
14 reactor.

15 DR. MAKHIJANI: Mark, you know, we
16 can always go back to the interviewee and try
17 to get more details.

18 CHAIRMAN GRIFFON: Yes. I think
19 you probably should, yes.

20 DR. MAKHIJANI: Maybe it is up to
21 us to get more details.

22 CHAIRMAN GRIFFON: Yes. But, as

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1 far as the other one, this will be assessed in
2 the regular coworker model, I assume.

3 DR. TAULBEE: Yes.

4 CHAIRMAN GRIFFON: You have area
5 survey information for that, for the test
6 reactor?

7 DR. TAULBEE: Yes, we do.

8 CHAIRMAN GRIFFON: Yes. So that
9 answers that question right there.

10 DR. TAULBEE: Yes.

11 CHAIRMAN GRIFFON: Okay.

12 DR. TAULBEE: It's actually filed
13 with the 300 and 700 areas, is where the
14 actual area survey data is.

15 DR. MAKHIJANI: So there were two
16 issues there. I just put them under the same
17 item because I didn't know what to do with
18 that information.

19 Okay. Now I'm not sure this is an
20 SEC issue or not, and it is kind of --

21 CHAIRMAN GRIFFON: You're going on
22 to Number 20, right?

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1 DR. MAKHIJANI: Number 20, a
2 placeholder, because we had raised this in the
3 site profile.

4 I know, from having looked at the
5 fault tree databank, which, unfortunately, we
6 do not have as yet, but we have my summary of
7 it, which I have distributed to NIOSH. I
8 don't know if you have it, Tim.

9 DR. TAULBEE: If you have
10 distributed it to us, I can get access to it.

11 DR. MAKHIJANI: Okay. If you
12 don't, just let me know. I can send it to
13 you. It was from an old 1980s report that was
14 compiled.

15 There's a lot of description of
16 very high radiation fields, workers, you know,
17 working with jumpers, getting junction boxes
18 in the tank farm, where the geometry of
19 exposure is very odd, very often coming from
20 the ground or below the worker, and I guess
21 not that different than what we did at
22 Mallinckrodt.

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1 The main reason it is in here is
2 we have a grip on describing these geometries
3 because, if we don't, then it would be hard.
4 But we raised this issue, I think, in our TBD,
5 the evaluation report that we discussed.

6 DR. TAULBEE: I'm not sure what it
7 is you're asking us to do.

8 DR. MAKHIJANI: Well, when you are
9 trying to reconstruct doses, you know, you
10 need -- you are reconstructing organ doses.

11 DR. TAULBEE: Right.

12 DR. MAKHIJANI: The geometry is
13 very important.

14 DR. TAULBEE: Absolutely, and we
15 have correction factors for --

16 DR. NETON: Although I think it is
17 the exposure geometry through the badge that
18 he is talking about.

19 CHAIRMAN GRIFFON: Yes.

20 DR. MAKHIJANI: Right.

21 DR. TAULBEE: It is not the --

22 DR. NETON: No, but, for example,

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1 Arjun mentioned the issue of Mallinckrodt was,
2 if you had a spill on the ground, like say
3 this is a tank-farm scenario and there is a
4 spill, how does that badge respond, how does
5 that, the recorded badge reading respond to
6 the organ dose in the lower GI tract for a
7 spill versus working in overhead piping or
8 that kind of thing?

9 CHAIRMAN GRIFFON: Yes, yes.

10 DR. MAKHIJANI: And in some
11 circumstances, it can be very important. It
12 seemed to me, us, when we prepared the TBD
13 review that, for the tank, it's not a general
14 issue everywhere, but for the tank farm there
15 seemed to be enough incidents and spills and
16 particular work situations that seemed
17 important to pay attention to. But we haven't
18 had a response.

19 DR. TAULBEE: There are
20 corrections that we can apply to that
21 geometry, like we do for the glove box TIB
22 that can be applied to workers in the tank

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1 farm.

2 DR. NETON: We probably need to
3 take a look and see what these unique
4 geometries may be. I mean that is the issue
5 you have raised.

6 DR. MAKHIJANI: Basically, yes.

7 CHAIRMAN GRIFFON: Right.

8 DR. NETON: We have not really
9 addressed that. I'm not certain what type of
10 exposures there were in these unique
11 geometrical configurations, but I think we
12 probably do need to --

13 DR. TAULBEE: Mostly, it would be
14 a spill type on the floor. If you look at the
15 tank farms --

16 DR. NETON: And Arjun's right,
17 there are corrections that could be applied,
18 but we need to look at it to see if they were
19 necessary and what frequency would apply.

20 DR. MAKHIJANI: I think, once the
21 ability to specify geometries is demonstrated,
22 this issue will go away, in my opinion.

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1 DR. TAULBEE: And to answer your
2 question about identifying who, from the
3 dosimetry badge, we can tell who picked up a
4 dosimeter badge in that area.

5 CHAIRMAN GRIFFON: Right. So you
6 could hit on that.

7 DR. TAULBEE: So we can place who
8 was there.

9 CHAIRMAN GRIFFON: So it wouldn't
10 be a matter of applying the correction factor
11 to everybody site-wide. You could limit
12 it to --

13 DR. TAULBEE: Limit it to the tank
14 farm, sure.

15 CHAIRMAN GRIFFON: Yes.

16 DR. MAKHIJANI: Yes. I mean this
17 is how we handled -- and the reason, I
18 normally don't say stuff like that in a Work
19 Group meeting, but the reason I said that is
20 we had had quite extensive technical work on
21 this very issue in Mallinckrodt and NIOSH went
22 to great lengths and actually created

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1 correction factors and did models. All that
2 is part of the literature that was produced as
3 part of the Working Group process.

4 DR. NETON: And that is consistent
5 with what we decided how we were going to
6 approach these individual issues.

7 At one point, if you remember,
8 this was on the overarching issues list, and
9 the decision was made that it would be too
10 difficult to develop a generic approach to
11 these sort of case-specific situations.

12 CHAIRMAN GRIFFON: Right. Yes.

13 DR. NETON: So I agree that we
14 need to exercise some due diligence here and
15 go and look at the --

16 DR. MAKHIJANI: So this is kind of
17 a placeholder from the TBD, where it kind
18 of --

19 CHAIRMAN GRIFFON: So that is on
20 NIOSH's actions.

21 CHAIRMAN GRIFFON: That's fine,
22 yes. Okay.

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1 MEMBER LOCKEY: I'm sorry, can you
2 tell me what you mean by geometry of exposure?

3 DR. NETON: Yes. It's the
4 configuration of the exposure source relative
5 to where the badge was worn on the body. So,
6 for example --

7 MEMBER LOCKEY: So face level,
8 floor level, above your head --

9 DR. NETON: Yes. For example,
10 most badges assume that the exposure came in
11 directly perpendicular at the body, parallel
12 plane.

13 DR. MAURO: Arjun, this is John.

14 I recall an analysis with a table.

15 I can almost visualize it where, in order to
16 evaluate the potential significance of this
17 issue, we actually modeled a badge, a specific
18 badge, a particular design, and then how the
19 response of the badge would change as a
20 function of angle of incidence right up to 180
21 degrees, and as a function of energy of the
22 photon, in this case, impinging on the badge.

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1 So you're right, we did a lot of
2 work on that, just to see, are we talking
3 about correction factors that are small or
4 large? I remember, when the angle of
5 incidence was fairly large, you know, off-
6 normal, and the energy of the photon is
7 relatively low, you could miss a lot.

8 I know we did work on that. I
9 know we delivered some reports on that. But
10 this goes back a ways.

11 DR. NETON: Yes, John, this is
12 Jim.

13 I recall that work as well. But
14 that, I think, was more related to these sort
15 of non-AP geometry scenarios that are sort of
16 angle of incidence. I think what we are
17 talking about here is unique exposure work
18 conditions.

19 DR. MAURO: Yes.

20 DR. NETON: You know, piping
21 overhead versus floors, that sort of thing.

22 DR. MAURO: Yes.

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1 DR. NETON: That is a piece of it,
2 but I don't know that Arjun specifically in
3 this instance was talking about like an
4 oblique exposure angle. I think more, in
5 general, he was talking about the work
6 conditions themselves that we could model.

7 DR. MAURO: Okay.

8 DR. NETON: Do you know what I'm
9 saying?

10 DR. MAURO: Okay. So, really,
11 it's not so much that -- if you know the angle
12 and the energy, you could deal with it.

13 DR. NETON: Yes.

14 DR. MAURO: The question is, what
15 assumptions are you going to make regarding
16 what the angle of the energy is?

17 DR. NETON: Exactly.

18 DR. MAURO: I'm with you.

19 CHAIRMAN GRIFFON: So Number 21.

20 DR. MAKHIJANI: Yes.

21 Steve, are you on the line? Steve
22 Marschke?

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1 MR. MARSCHKE: I'm here.

2 DR. MAKHIJANI: Item Number 21 on
3 OTIB-0052, this is your baby. I think we
4 agreed with NIOSH that OTIB-0052 was fine for
5 external dose for most construction workers,
6 but there seemed to be an issue for
7 pipefitters at the Savannah River Site that I
8 don't think got resolved. But I am not part
9 of the Procedures Working Group, so I don't
10 know where that is.

11 I do not believe the pipefitters
12 question at Savannah River Site has been
13 resolved, and it is germane because you want a
14 bounding dose.

15 MR. MARSCHKE: I think the way we
16 resolved that in OTIB-0052 was -- I think
17 NIOSH was supposed to insert some wording into
18 one of the other OTIBs. Maybe it was
19 OTIB-0020. Would that sound right? Where
20 they, basically, for external doses, you know,
21 if the person whose doses are being
22 reconstructed is a construction worker, they

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1 are given a heads-up in this OTIB, I think
2 it's 0020, that they may have to use a special
3 modeling beyond the 1.4 multiplier, if he's a
4 pipefitter or something like that and he had
5 indication that he may have received higher-
6 than-normal exposures.

7 Jim?

8 DR. NETON: Yes?

9 MR. MARSCHKE: Do you recall?

10 DR. NETON: That rings a bell with
11 me, Steve. I don't know that it is OTIB-0020,
12 though.

13 MR. MARSCHKE: I'm not sure it's
14 0020, either. I'm trying to recollect from
15 the top of my head here.

16 DR. NETON: Yes.

17 MR. MARSCHKE: Maybe I can pull up
18 the actual --

19 DR. NETON: Yes, I'm looking for
20 it right now myself.

21 DR. TAULBEE: I guess I'm a little
22 confused on this. Maybe you all can educate

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1 me on this.

2 We're looking at an unmonitored
3 pipefitter, correct? Because a pipefitter
4 that would be working in the canyons or one of
5 the lines, they would be wearing a badge and
6 we would be using their dosimetry. So this
7 would be somebody who was not monitored.

8 DR. NETON: Well, is that the
9 issue that is raised here or is that --

10 DR. TAULBEE: Well, that's what
11 I'm asking. I don't understand.

12 DR. NETON: Well, I think the
13 issue with TIB-0052 was, if they were
14 monitored, the correction factor of 1.4 is not
15 necessarily adequate for pipefitters. I think
16 that was recognized in the review of the SRS
17 data, when we looked at, when we reviewed
18 TIB-0052.

19 DR. TAULBEE: Could you say that
20 again, please? I'm sorry.

21 DR. MAKHIJANI: You know, I think
22 Tim is right. I think TIB-0052 applies to

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1 unmonitored.

2 CHAIRMAN GRIFFON: Yes,
3 unmonitored, yes.

4 MR. MARSCHKE: TIB-0052 is
5 unmonitored workers. If you have the
6 monitors, if the guy was wearing a monitor,
7 then --

8 DR. NETON: Oh, I'm sorry, yes.
9 Yes, never mind. A senior moment there.

10 MR. MARSCHKE: -- there's data.

11 DR. NETON: Yes. Okay.

12 MR. MARSCHKE: And what it is
13 is --

14 DR. NETON: It's 1.4 times the
15 coworker model for that, yes.

16 MR. MARSCHKE: The construction
17 worker coworker, external coworker model was
18 1.4 times the non-construction worker.

19 DR. NETON: Okay. So I will
20 rephrase what I said then. If it is the
21 coworker model that is applied to an
22 unmonitored worker, 1.4 might not be adequate.

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1 DR. MAKHIJANI: Yes, and the
2 way --

3 CHAIRMAN GRIFFON: For that class
4 of workers.

5 DR. NETON: For that class.

6 CHAIRMAN GRIFFON: Right.

7 DR. MAKHIJANI: Just to let Tim
8 know what the argument was, it was the whole
9 correction factor was developed by comparing
10 all the monitored construction worker
11 monitored workers to non-construction worker
12 monitored workers, and NIOSH developed this
13 1.4 correction factor to apply to the coworker
14 model.

15 When we analyzed the coworker
16 model by job type, we found that it was fine
17 if you applied, when you compared -- we simply
18 applied the model, not knowing whether
19 somebody was monitored or they actually were
20 monitored; did you cover their dose? And you
21 did except for pipefitters, et cetera.

22 So that's where the inadequacy of

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1 the 1.4 came.

2 Did I do that right, Steve?

3 MR. MARSCHKE: Yes, that sounds
4 about right, Arjun. We looked at about 20
5 construction workers who had monitoring data,
6 and we said, well, what happens if they
7 didn't? If we use the 1.5 methodology for
8 these 20 workers, and we got the results, what
9 were those results compared to the actual
10 monitoring data?

11 And for most of the cases, except
12 for the pipefitters, we found that the
13 OTIB-0052, the 1.4 was a good multiplier, but
14 a claimant-favorable multiplier.

15 And the way we decided, I believe,
16 to handle the pipefitters was, instead of --
17 like I say, put a heads-up in one of the other
18 OTIBs. Again, I am not sure which one it was.

19 DR. MAKHIJANI: Yes, I don't know
20 what kind of heads-up.

21 CHAIRMAN GRIFFON: Yes. What does
22 that do for you? I'm not sure. Yes.

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1 DR. MAKHIJANI: In an SEC context,
2 I would think that we would want to know what
3 the heads-up is.

4 CHAIRMAN GRIFFON: Yes, I think we
5 need to pin it down here.

6 DR. TAULBEE: So, if I'm
7 understanding, you're asking us to go through
8 and develop what the correction factor would
9 be for pipefitters?

10 DR. MAKHIJANI: Yes, how would you
11 cover this piece of the group of workers?

12 CHAIRMAN GRIFFON: Yes, yes.

13 DR. MAKHIJANI: That part of the
14 class.

15 DR. TAULBEE: So pipefitter-
16 specific: the correction factor. Right, that
17 could be done.

18 CHAIRMAN GRIFFON: Okay, 22,
19 Arjun.

20 DR. MAKHIJANI: Badge is not
21 capturing dose. This is kind of a familiar
22 issue.

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1 CHAIRMAN GRIFFON: Yes.

2 DR. MAKHIJANI: Worker interviews
3 have said, basically, that they took off their
4 badges or did not have badges, thinking that
5 they were in clean areas. This is a familiar
6 issue, and it has come up in interviews, and
7 not from our review of documentary records.

8 MR. MARSCHKE: Arjun?

9 DR. MAKHIJANI: Yes?

10 MR. MARSCHKE: Can I also indicate
11 that this is one, when we did the paper study
12 back last -- I don't know if this was
13 December -- this was one, by reviewing the
14 affidavits --

15 DR. MAKHIJANI: Right.

16 MR. MARSCHKE: -- that were
17 associated with the SEC petition. This was
18 one of the conclusions that we came up with in
19 that paper study was that a lot of the people
20 who provided the affidavits were concerned
21 that badges didn't capture all their doses.

22 One gentleman, in particular, that

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1 I can remember said he used to go to work on
2 the weekends, and there weren't any badges
3 available on the weekend or on off-hour
4 shifts.

5 So this was the concern that I
6 think we came up with in our paper study from
7 a review of the affidavit.

8 DR. MAKHIJANI: Yes. Thank you
9 for reminding me.

10 What I will do is, when I fix
11 those other couple of items in the matrix, I
12 am going to put a little more detail in the
13 comment column, so that it is not so opaque.

14 But, you know, we would look for
15 guidance from the Working Group as to where to
16 go next with this.

17 MEMBER CLAWSON: Arjun, there was
18 another part to it in those interviews about
19 that because on the overtime roster they could
20 be used anywhere they were. When they left
21 that area, they left their badge there, went
22 to the other area and worked, and there were

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1 no badges there for them, and when told stuff,
2 it was that they were being covered by the
3 other people there. So their dose was
4 supposedly being calculated, and I see nothing
5 -- that's kind of a coworker badging thing,
6 but there's nothing official in the Savannah
7 River Site documents of how to be able to do
8 that.

9 But, see, these workers could, and
10 I'm speaking construction workers, could be
11 used anywhere on the site. This is where it
12 got into a big issue, and this is where the
13 weekend came up because they would come to the
14 main place, go back out, and there was no
15 badges there for them, but they still went in
16 and did the work.

17 DR. MAKHIJANI: I will definitely
18 provide you with a little more detail. We
19 have more detail on this.

20 DR. TAULBEE: If you can provide
21 time periods, that would be very beneficial.

22 DR. MAKHIJANI: I don't know if I

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1 can do that. We could certainly go back.
2 Okay, let me make a note of that.

3 DR. TAULBEE: Because I know from
4 the procedures that they were to pick up a
5 visitor badge and we have lots of visitor
6 logs, especially of construction trades,
7 signing into areas. In fact, most of the
8 construction trades did sign in. They didn't
9 have a routine badge in their area.

10 So, if you can give us some
11 pointers to look at?

12 CHAIRMAN GRIFFON: So they should
13 have picked up a visitor badge? But then that
14 would --

15 DR. TAULBEE: But it sounds like
16 that didn't always happen --

17 CHAIRMAN GRIFFON: Was that dose
18 assigned to them?

19 DR. TAULBEE: Yes, it was.

20 CHAIRMAN GRIFFON: Okay. It
21 wasn't just read and it was not --

22 DR. TAULBEE: No, no.

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1 CHAIRMAN GRIFFON: No? Okay.

2 MEMBER CLAWSON: Also, what would
3 happen --

4 DR. TAULBEE: It had their payroll
5 ID.

6 MEMBER CLAWSON: -- sometimes in
7 this response was, that they came into these
8 areas and stuff like that, like one individual
9 said they went into the area; it didn't
10 require badges, or whatever. And this was new
11 construction, right? So one of the facilities
12 -- and as they came out, all the area that was
13 in there was posted as a radiation area.

14 So that is where their confusion
15 comes up and where they feel that the badging
16 wasn't 100 percent, and so forth like that.

17 CHAIRMAN GRIFFON: I mean a couple
18 of these things that come up in the next
19 couple of things actually are items on my
20 overall -- and this comes up in all of our SEC
21 reviews, but the question of data validity and
22 data completeness kind of rolls in amongst

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1 these.

2 I know in your evaluation report
3 you did at least some work on that, because I
4 have seen that.

5 Can you describe -- this is for
6 external, but was the external/internal
7 bioassay, you know, external badging program
8 and the bioassay program as far as generally
9 what they did over time, or is that in the ER
10 report or probably in the TBDs?

11 DR. TAULBEE: It's probably more
12 in the TBDs.

13 CHAIRMAN GRIFFON: Yes.

14 DR. TAULBEE: I'm not sure of
15 that, but I can describe certainly the
16 external part.

17 CHAIRMAN GRIFFON: The external
18 might be easier to know.

19 DR. TAULBEE: But let me talk a
20 little bit about something that Brad brought
21 up because we have seen this as well in the
22 records.

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1 If you look at many of the
2 radiation survey records, when we were going
3 through and collecting the neutron data, there
4 were times when there would be a new
5 construction project that was being conducted,
6 and there would be specific indication in the
7 radiation survey record that the construction
8 workers were not going to be badged.

9 And if you look, they would have a
10 map drawn around, and they would hang
11 dosimeters, film dosimeters, on the outer
12 perimeter, and they would kind of set up an
13 internal exclusion area. The construction
14 workers would go in and do their work and they
15 would come out.

16 The monitoring is recorded there
17 in that particular, those radiation survey
18 reports, when that occurred. You also find
19 indication of that in the works' technical
20 reports. They will specifically outline when
21 they were doing these particular types of
22 operations. We have seen the match between

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1 the works' technical and the radiation
2 surveys.

3 So, in those particular instances,
4 they were monitoring the construction trades
5 workers, especially offsite workers for the
6 100-millirem exposures, is what they were
7 monitoring for. Now would that appear in
8 their records? No, that would not, from that
9 particular scenario. But their dose was less
10 than 100 millirem, is what they were
11 recording.

12 So I guess the question, then,
13 becomes, with us assigning a coworker model,
14 would that cover that? If we took the
15 exposure of the coworkers and applied the 1.4
16 correction factor, would that cover it? I
17 think we can look a little bit closer at that,
18 you know, as to how many of these types of
19 jobs might be conducted in a particular year,
20 or something like that.

21 CHAIRMAN GRIFFON: What timeframe
22 was that that you're talking about?

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1 DR. TAULBEE: In the 1960s and
2 70s.

3 CHAIRMAN GRIFFON: The 60s.

4 DR. TAULBEE: Yes, that we have
5 seen these breakouts of areas.

6 It wasn't common, but I can think
7 of like three or four that we ran across in
8 our limited scoping with the neutrons where we
9 saw that. So the interviews are absolutely
10 right that you weren't monitored, but there
11 was an exclusion zone and they were monitoring
12 the perimeter to make sure the exposures were
13 less than 100 millirem.

14 MEMBER CLAWSON: Well, one of the
15 questions on this was how often those badges
16 were changed out and so forth, because this is
17 what kind of drove the requirement to all of a
18 sudden be badged. They were given one -- I
19 can't remember the exact building, but,
20 anyway, they were adding on to it, and they
21 were digging away in to the side of it. All
22 of a sudden, when they, I guess, pulled their

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1 outer badges, or whatever else like that, that
2 blew them way over their 100. Then, all of a
3 sudden, they had to be badged.

4 This is the construction part. It
5 would be real difficult to be able to follow a
6 lot of this, in listening to what they had to
7 say and so forth, how this was done.

8 So, I don't know, we need to
9 figure out some way to be able to prove to me,
10 I guess, that they were covered under that
11 because --

12 CHAIRMAN GRIFFON: I think the
13 frequency is important, too, you know.

14 MEMBER CLAWSON: Right.

15 CHAIRMAN GRIFFON: If it happened
16 all the time, then I could see it would be a
17 headache to try to piece it all together.

18 DR. TAULBEE: What you are talking
19 about sounds like something around the canyons
20 or around the tank farm that would be sudden,
21 very high exposures when they moved too much
22 dirt.

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1 MEMBER CLAWSON: Actually, one of
2 them, they were talking was a line that went
3 underneath the road that they were out working
4 on. Once they took the dirt off of it, all of
5 a sudden -- and they were supposedly in a
6 clean area -- and they replaced this whole
7 thing, and as they were loading this old
8 piping onto the truck, somebody walked --
9 well, they drove by with a vehicle with a
10 meter in it, and it pegged it out.

11 This is part of their concerns of
12 what came out of a lot of these interviews,
13 plus, how often that these were changed out.
14 Because one day they would go in there and it
15 wasn't a radiation area; the next day, all of
16 a sudden, it was a radiation area, and they
17 had been in there for a month and a half, two
18 months.

19 So that was part of the questions
20 that I heard on the interviews, and so forth.

21 DR. TAULBEE: I know it is a
22 matter of doing a lot of monitoring. So, when

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1 it triggered above certain areas, they started
2 to rope it off then, and you will see that in
3 the surveys. If you look at the reason for
4 the survey, they will indicate why they were
5 doing different things.

6 That's why the more specific you
7 can give me, the better. I can look into it.

8 DR. MAKHIJANI: I had a question
9 about your 1.4 in this context. Because 1.4
10 is for unmonitored workers.

11 DR. TAULBEE: And that's what
12 you're talking about.

13 DR. MAKHIJANI: But here we are
14 talking about, no, here we are talking about
15 monitored workers who --

16 CHAIRMAN GRIFFON: Were missed
17 during that time.

18 DR. MAKHIJANI: -- who were missed
19 during particular time periods. So you
20 wouldn't be identifying them as unmonitored
21 workers and applying any 1.4 factor. There
22 would be nothing to -- I think it is important

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1 not to conflate these two issues.

2 MR. WARREN: This is Bob Warren.

3 I wanted to get into the
4 discussion on this one because Johnny Williams
5 is my client, and he worked the weekend where
6 there weren't any badges. This was 221F,
7 221H, and cleaning contamination equipment
8 where he didn't have a badge for the weekend.
9 How would you use coworker? There was nobody
10 there but him and another person that wouldn't
11 have badges.

12 So somehow you have got to get not
13 only the construction workers, but the
14 production workers that weren't monitored.

15 DR. TAULBEE: The badging cycle
16 changed depending upon area, and it was a
17 different day of the week for each area. It
18 wasn't all at once. On a Monday, the badges
19 would be changed out at one particular
20 facility, on Tuesday at another particular
21 facility, on Wednesday at the other.

22 CHAIRMAN GRIFFON: You mean

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1 personnel badges?

2 DR. TAULBEE: The personnel
3 badges.

4 CHAIRMAN GRIFFON: Yes.

5 DR. TAULBEE: So, when they would
6 change out the badges, their procedure was
7 they had a set of blank fresh badges that
8 would be put on the rack immediately after
9 they removed the other racks from there. And
10 you will see that in the individual monitoring
11 records. Typically, there was a factor of,
12 well, say, a thousand between the two. So you
13 would have badge 563, one for the one two-week
14 cycle; the following two-week cycle would be
15 263 or 2563.

16 MR. WARREN: But if you didn't
17 pick up a badge, how would you get them
18 monitored for the weekend?

19 DR. TAULBEE: What I am trying to
20 explain is that, during the exchanges, your
21 regular badge would be removed, but your new
22 badge would be put there. So I haven't found

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1 an instance on a weekend in any of the
2 facilities where this could be an issue.

3 MR. WARREN: Well, I mean he gives
4 a statement, and several other people give
5 statements, and we have asked for the records
6 that DOE had of the backup of what happened on
7 those weekends. We have never been able to
8 get them.

9 DR. MAKHIJANI: Mark, you know,
10 this weekend question that Brad just mentioned
11 came up more generally during our interviews.

12 I think this may be not so hard to address in
13 the sense that, if we go into the raw records,
14 and can find when somebody was working there
15 and identify where there were Saturdays and
16 Sundays, or what the shift was, I don't know
17 whether that would be in NIOSH's bailiwick as
18 part of your other issue work or whether it
19 would be in ours.

20 But I would think that, in
21 principle, we should be able to verify whether
22 people were really not wearing badges on

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1 weekends or whether they were, and whether
2 there was a normal practice of that.

3 MR. WARREN: We would like to see
4 that.

5 MEMBER CLAWSON: Tim, if I could
6 expand on this a little bit, one of the
7 questions, we heard about the badging sequence
8 and it would be different times. When it came
9 to weekends and over the nights, and so forth
10 like that, sometimes when they would change
11 the badges out, they would only have two or
12 three visitor badges that were spare there.

13 And when you may change a whole
14 group that would be coming in, 20 or 30
15 people, there wasn't enough visitor badges to
16 go around, and they still went in the area and
17 still worked.

18 We heard this on numerous
19 occasions, that, well, the visitors, we have
20 got two or three visitors' badges, so that
21 will help to cover for all of you. And we
22 heard this from the operations side and also

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1 from the construction side, the operations not
2 so much because they were mainly assigned in
3 the area, but as a construction worker, they
4 could be utilized any place on the site.

5 I think every account that we have
6 had on the interviews said there wasn't
7 visitor badges enough sometimes; sometimes
8 there weren't any.

9 So this was kind of the question
10 of the data adequacy, and so forth.

11 CHAIRMAN GRIFFON: But I think
12 that only can be done -- I am questioning
13 myself who should do it. I think NIOSH should
14 probably do the initial follow-up on that,
15 yes.

16 MEMBER CLAWSON: Well, and I think
17 it would come back to NIOSH because their
18 policy, I guess to ask how Savannah River's
19 policy was for handling this. We have heard
20 from some of the RadCon folks that, yes, we
21 had a procedure in place on how to handle
22 this, but we have never seen anything

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1 officially. We have heard the comments, but
2 we haven't seen, you know, how do you do it?

3 DR. TAULBEE: Before we follow it
4 up --

5 CHAIRMAN GRIFFON: Yes.

6 DR. TAULBEE: -- can I get more of
7 your specifics from the individual interviews
8 that you've got indicating where some of this
9 might have occurred and such --

10 CHAIRMAN GRIFFON: Yes.

11 DR. TAULBEE: -- that I could have
12 something to begin to try to --

13 CHAIRMAN GRIFFON: Right.

14 DR. MAKHIJANI: We need to also
15 publish these interviews.

16 CHAIRMAN GRIFFON: Yes.

17 DR. MAKHIJANI: We have had a
18 little bit of difficulty in putting them all
19 together, for various reasons.

20 I don't know. Kathy, are you on
21 the line?

22 (No audible response.)

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1 I'll get back to the Work Group --

2 CHAIRMAN GRIFFON: Yes.

3 DR. MAKHIJANI: -- about the
4 interviews. As we were talking, I kind of
5 felt that we need to -- maybe the next thing
6 to do would be the action issue along with
7 these spreadsheets of Steve's, to give you at
8 least as many of the interviews as have gone
9 through the DOE process and come back from the
10 workers themselves after they reviewed it for
11 accuracy, and put them on the O: drive.

12 CHAIRMAN GRIFFON: Okay. All
13 right. That sounds like a good action.

14 Now can I go back to the question
15 about the external dose program in general?

16 DR. TAULBEE: Yes. Okay.

17 The badging was set up such that
18 whichever area was your main work area is
19 where you were badged out of. When you
20 entered through the gate, we saw where we
21 would be going through the gates, there would
22 be badge racks, and that is where you would

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1 pick up your badge at that particular time.

2 So, as I was indicating, from the
3 exchange of those badges, different areas were
4 exchanged on different days of the week, and
5 the practice was to, before you pulled
6 people's badges, you had a complete, like, set
7 of badges that you would put there immediately
8 after. So this was a single change-out in,
9 say, the 200F area, and it would take place
10 all at once, everybody that was in that area.

11 One of the things that would
12 happen is that, if somebody was working at the
13 time and wasn't there during that particular
14 exchange, it would be called a late pull. So
15 you will see that throughout the records as
16 well, that this person wasn't there, their
17 badge was missing from the rack when they were
18 collected, and they would typically collect it
19 in the next week or so, and they were analyzed
20 at that time.

21 The same would happen if there was
22 an incident or a high-exposure event that

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1 would occur or a potential for one, and they
2 were concerned this person might be
3 overexposed. They would pull the individual's
4 badge, and they would go and read it, and that
5 was called a special pull.

6 So, on a monthly or, actually,
7 cycle basis, you will see these reports of
8 late pulls and special pulls associated with
9 each of the December cycles that we have.

10 So I think you want me to go
11 through --

12 CHAIRMAN GRIFFON: Yes.

13 DR. TAULBEE: -- the data here.

14 CHAIRMAN GRIFFON: Explain table
15 6-1 to me, given what you just said.

16 (Laughter.)

17 DR. TAULBEE: Sure. Sure. Table
18 6-1. Okay.

19 What we did for our evaluation
20 here was, and this was what qualified, in our
21 minds, what qualified the special exposure
22 cohort. It was the CPWR analysis went through

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1 HPAREH, and they indicated that the
2 construction workers in the early years were
3 under-reported within that particular
4 database.

5 And so our development of a
6 coworker model wasn't particularly valid for
7 the construction trades workers because we
8 were only looking at 5 to 10 percent of the
9 people.

10 So what we did was we went
11 through, and table 6-1 is basically just a
12 summary of HPAREH, the columns there to the
13 right, the number of workers. Then, let's
14 see, the second column is the number of
15 reported monitored workers in this WSRC-RP-95,
16 which is a history of the Savannah River Site
17 dosimetry, external and internal dosimetry
18 program. It was written by George Taylor, Ken
19 Crase, Tom LaBone, and whoever the other
20 author was.

21 So we were just comparing, first
22 of all, the number of monitored workers, and

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1 HPAREH was capturing a great deal of them.
2 But this is, again, not necessarily including
3 construction trades workers.

4 And what we compared was table or
5 figure 6-1, just the number of monitored
6 workers.

7 Next to that, we went through and
8 compared the number of workers in the fourth
9 quarter reports. One of the things we
10 captured at the Savannah River Site during the
11 SEC petition was all of the dosimetry records
12 from 1958 forward of everybody who was
13 monitored on a quarterly basis and what their
14 dosimetry results were.

15 So we had the ability to go
16 through and tally up the number of people, and
17 that is what this is showing.

18 As far as when you go over to --

19 CHAIRMAN GRIFFON: Before you go
20 to the next page --

21 DR. TAULBEE: Sure.

22 CHAIRMAN GRIFFON: -- what I'm

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1 trying to figure out is, out of the HPAREH
2 records, you have, like pick any year really,
3 but 1955. It says the number of workers is
4 3,177.

5 DR. TAULBEE: Okay.

6 CHAIRMAN GRIFFON: And then the
7 deep dose records is 2,000. If they're
8 measured quarterly, I would have expected to
9 see more like 12,000 there.

10 DR. TAULBEE: Well, each period
11 is --

12 CHAIRMAN GRIFFON: Am I
13 interpreting this wrong?

14 DR. TAULBEE: -- an annual
15 summary.

16 CHAIRMAN GRIFFON: An annual
17 summary? Okay, then I would expect 3,000.
18 There were 3,177 there.

19 DR. TAULBEE: Okay. What I
20 believe that these are is the --

21 CHAIRMAN GRIFFON: I would expect
22 at least it equals the number of workers.

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1 DR. TAULBEE: Let me get back to
2 you on that because, unless it is written here
3 in the text --

4 CHAIRMAN GRIFFON: Yes, I was just
5 confused by that.

6 DR. TAULBEE: I knew I had it at
7 one time, as to what was happening there.

8 CHAIRMAN GRIFFON: And it might be
9 in the text, right? I'm just glancing at
10 this.

11 DR. TAULBEE: Let me take that
12 action and get back to you on it.

13 CHAIRMAN GRIFFON: Okay. Okay.

14 DR. TAULBEE: I know there's a
15 simple explanation for it, but it is escaping
16 me right now, because I remember I had the
17 same question: how could we have more
18 monitored workers than actual records?

19 CHAIRMAN GRIFFON: Right, right,
20 right, yes.

21 DR. TAULBEE: Okay. Sorry.

22 CHAIRMAN GRIFFON: No, that's all

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1 right.

2 DR. TAULBEE: Mike Mahathy, are
3 you on the phone?

4 MR. MAHATHY: Yes.

5 DR. TAULBEE: Mike, do you
6 remember the answer to this one, as to why the
7 number of monitored workers differs from the
8 shallow-dose and deep-dose records?

9 MR. MAHATHY: I thought I asked
10 Mel to check with Gene Potter.

11 DR. TAULBEE: Okay. Thank you.

12 If I could continue just a little
13 bit more on this?

14 CHAIRMAN GRIFFON: Yes, yes.

15 DR. TAULBEE: What we did to
16 evaluate what CPWR had brought up or raised to
17 our attention was we went through with HPAREH
18 and we calculated what the dose distribution
19 would be for all workers for specific time
20 periods and we took the fourth-quarter reports
21 and calculated what their annual dose was,
22 which would be a summation of the previous

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1 four quarters.

2 And we compared HPAREH to that
3 fourth-quarter summary in 1960, 1965, 1970,
4 and 1975. What we found was that the HPAREH
5 data matched pretty closely to the complete
6 dataset. So, even though HPAREH was made in
7 the late 1960s or 1970s, it didn't include
8 some of these early workers that dropped out.

9 The actual dose information that was captured
10 because there's so much of it in HPAREH didn't
11 differ much from when you evaluate the
12 complete record set.

13 Then we specifically went and
14 looked at construction trades workers, and we
15 found, basically, the same thing. What you
16 will see from the HPAREH records, construction
17 trades workers in 1960, there's only 202
18 listed there, and in the fourth-quarter
19 reports there's 747 individual construction
20 trades workers. But, again, the dose
21 distributions didn't change much.

22 So this is what we considered why

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1 we qualified the petition, was we didn't know
2 this particular answer. It was, were
3 construction trades workers different? And
4 what we found when we went through the
5 analysis and captured the records is that they
6 were not significantly different.

7 We then went through, and what you
8 will see, then, figure 6-3, that's the fourth-
9 quarter analysis with HPAREH. Figure 6-4,
10 this is where we had HPAREH for 1960, and we
11 looked at the fourth quarter. It showed about
12 the same distribution, slightly lower. But we
13 had all of the individual workers from 1960,
14 including part-time construction trades
15 workers that were only there for a short
16 period of time. We tallied all of their
17 particular doses as well.

18 What we found was a decrease in
19 the distribution because apparently some of
20 these short-term workers would pull down their
21 normal distribution. So this is why we felt
22 HPAREH was sufficiently accurate in order to

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1 develop the coworker model.

2 Questions?

3 CHAIRMAN GRIFFON: I don't have
4 any right now, except for that first one.

5 DR. TAULBEE: That first one, yes.
6 We will get an answer to you on that.

7 CHAIRMAN GRIFFON: Then, going
8 back, and you don't have to describe the whole
9 internal monitoring program to me, but in the
10 period in 6-1 it talks about the validity
11 analysis that you guys did. It's on page 31
12 at the very top, right before 6-2. Yes,
13 you've got it.

14 DR. TAULBEE: Okay.

15 CHAIRMAN GRIFFON: Reviewed
16 entries in four bioassay log books covering a
17 period of six years. Then you had some, I
18 guess, 200 log books that you considered.

19 Can you describe the process that
20 you went through there and why you only did it
21 over a six-year period?

22 DR. TAULBEE: Why we only did it

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1 over a six-year period is primarily due to
2 time constraints --

3 CHAIRMAN GRIFFON: Oh, okay.

4 DR. TAULBEE: -- in trying to get
5 the ER out.

6 CHAIRMAN GRIFFON: But when you
7 say six years, it wasn't six years in a row.
8 I assume it was like something from the 50s
9 and 60s and up or --

10 DR. TAULBEE: I believe that is
11 correct, yes.

12 CHAIRMAN GRIFFON: Okay. All
13 right.

14 DR. TAULBEE: What we did is we
15 took 62 claimants that we had in the NOCTS
16 database that had internal monitoring data.
17 So we went back to the original log books to
18 see, can we find these particular entries
19 there in those log books? And that's what
20 this analysis was, of reviewing the 200. That
21 was just a random number of, how many can we
22 get done in this period of time, and about 200

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1 of them.

2 And we came up in that three of
3 the claims contained no data corresponding to
4 the log book entries, but that was less than 5
5 percent, and 57 percent of the claims we found
6 the corresponding data there in the log books.

7 CHAIRMAN GRIFFON: Right.

8 DR. TAULBEE: Oh, and of these,
9 about half of the claimants that we evaluated
10 were in construction-related positions.

11 CHAIRMAN GRIFFON: Okay. Is this
12 analysis on the O: drive anywhere?

13 DR. TAULBEE: I don't believe so.

14 CHAIRMAN GRIFFON: Or can it be
15 made available?

16 DR. TAULBEE: We certainly can.

17 CHAIRMAN GRIFFON: Yes.

18 DR. TAULBEE: Sure.

19 CHAIRMAN GRIFFON: I think that
20 seems to be a logical followup for SC&A, that
21 you've got to look at this data validation
22 done by NIOSH.

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1 DR. TAULBEE: Is this a different
2 issue or this -- oh, this is issue 23, right?

3 CHAIRMAN GRIFFON: Does that come
4 up under 23? I'm sorry.

5 DR. MAKHIJANI: I believe it did.

6 CHAIRMAN GRIFFON: Yes.

7 DR. TAULBEE: External accuracy
8 completeness. Okay.

9 CHAIRMAN GRIFFON: So this is more
10 internal, isn't it? Was this internal dose?

11 DR. TAULBEE: Yes.

12 CHAIRMAN GRIFFON: Yes.

13 DR. TAULBEE: That is all right.

14 CHAIRMAN GRIFFON: So, anyway,
15 yes.

16 DR. TAULBEE: Accuracy and
17 completeness.

18 DR. MAKHIJANI: I think 23 is the
19 more general issue.

20 CHAIRMAN GRIFFON: Yes.

21 DR. MAKHIJANI: No, it's external
22 dose.

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1 CHAIRMAN GRIFFON: Yes, we're on
2 external dose right now. So you might have to
3 add that one on to the end of the internal
4 section, actually.

5 DR. MAKHIJANI: Yes.

6 CHAIRMAN GRIFFON: Okay. I've got
7 a note of that.

8 DR. TAULBEE: I think, with the
9 external dose, based upon our analysis with
10 HPAREH, you know, with the exception of table
11 6-1 --

12 CHAIRMAN GRIFFON: Right, right,
13 right. That's the big question there.

14 DR. TAULBEE: -- I think we have a
15 pretty good handle on it.

16 CHAIRMAN GRIFFON: There might be
17 enough there for us at least to look at that
18 section more thoroughly. I mean, have you
19 guys reviewed that section, Arjun, the 6-2?

20 DR. MAKHIJANI: Well, no, we
21 haven't done a substantive completeness study
22 in the normal way that we would do it.

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1 Now we've got several overlapping
2 things --

3 CHAIRMAN GRIFFON: Right.

4 DR. MAKHIJANI: -- and I am
5 looking for a little guidance from you. We've
6 got all these coworker models coming out with
7 internal dose.

8 CHAIRMAN GRIFFON: Right.

9 DR. MAKHIJANI: So, for internal,
10 I would rather hold off on seeing those things
11 because Tim is collecting all this data.

12 At the same time, for
13 completeness, it seems to me that, since NIOSH
14 is gathering more data on an as-needed basis
15 going to -- you know, claimant data, not
16 enough; you're going to other sources of data
17 and adding to it, as I understood it.

18 DR. TAULBEE: We already have the
19 data in-house, it is just not codified yet.

20 DR. MAKHIJANI: That's what you
21 are doing.

22 So I don't know how you evaluate

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1 the completeness of that. You can evaluate
2 adequacy after NIOSH is done, whether it's
3 good enough, but --

4 CHAIRMAN GRIFFON: But validity I
5 think --

6 DR. MAKHIJANI: But looking at
7 validity --

8 CHAIRMAN GRIFFON: Yes.

9 DR. MAKHIJANI: -- and
10 completeness of individual dose data and how
11 you would fill those gaps for sort of
12 randomly-selected members of the class, this
13 would be a little bit of a different, but
14 overlapping exercise.

15 I mean we did that at NTS, in a
16 way. You know, we looked at 120 workers at
17 random and looked at all the records and
18 catalogued what monitoring they had and did
19 not have, only for internal dose, of course.

20 CHAIRMAN GRIFFON: Right, right.

21 DR. MAKHIJANI: So we are open to
22 your guidance on how you want us to proceed.

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1 CHAIRMAN GRIFFON: Well, for
2 internal, I mean, yes.

3 DR. MAKHIJANI: For external and
4 internal.

5 CHAIRMAN GRIFFON: I'm just
6 looking here. For internal dose, it seems
7 like NIOSH took an initial stab at here's how
8 we think we have validated the data that we
9 are using. That's in that Section 6.1.

10 DR. MAKHIJANI: Yes.

11 CHAIRMAN GRIFFON: Right?

12 DR. MAKHIJANI: So we can review
13 Section 6.1.

14 CHAIRMAN GRIFFON: So I think that
15 is the starting point, is review their
16 analysis of that, and Tim's going to post
17 that. So you will have to review.

18 DR. TAULBEE: I'm pretty sure all
19 that it is, is a spreadsheet.

20 CHAIRMAN GRIFFON: Right, right,
21 right.

22 DR. TAULBEE: I mean the write-up

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1 is right here.

2 CHAIRMAN GRIFFON: And the log
3 books. And the log books, right? Or are they
4 posted already?

5 DR. TAULBEE: Well, all the log
6 books are posted.

7 CHAIRMAN GRIFFON: Okay.

8 DR. TAULBEE: They're all in the
9 SRDB.

10 CHAIRMAN GRIFFON: Okay. Okay.

11 DR. MAKHIJANI: Now, very often,
12 the SRDB documents just have an SRDB number.

13 CHAIRMAN GRIFFON: I know.

14 DR. MAKHIJANI: That's very, very,
15 very difficult to extract.

16 MEMBER CLAWSON: We have discussed
17 this numerous times.

18 DR. TAULBEE: You can do a search
19 on the SRDB number.

20 DR. MAKHIJANI: Can we do it now?

21 CHAIRMAN GRIFFON: There's 200 log
22 books.

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1 DR. MAKHIJANI: Because the old
2 database was easier.

3 DR. NETON: I don't know which --

4 DR. TAULBEE: They're into the
5 databases we have.

6 DR. NETON: If you're in the
7 database we have, you could just do a word
8 search on that SRDB number and it will find it
9 for you.

10 DR. TAULBEE: Yes.

11 DR. NETON: At least that's the
12 way I do it.

13 DR. TAULBEE: But you can't do
14 title or text or --

15 DR. NETON: You know the number.
16 You type in the number, and if it is unique
17 enough, it will find that number and it will
18 identify most often --

19 CHAIRMAN GRIFFON: But I don't
20 think we know for these, for the 200 log
21 books.

22 DR. NETON: Oh, you don't have the

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1 number?

2 CHAIRMAN GRIFFON: For the 200 log
3 books, I don't think we have --

4 MEMBER CLAWSON: We have no way of
5 -- all we can do is go each one by each one.

6 DR. MAKHIJANI: We don't have a
7 list.

8 CHAIRMAN GRIFFON: Right. We
9 don't have a list.

10 DR. NETON: I thought they had the
11 SRDB number.

12 DR. TAULBEE: Well, they do, but
13 then they might be labeled, you know, this log
14 book versus that, and not all of them are
15 listed as a log book. I agree with you on the
16 use of this. We can come up with a list of
17 these log books for you and give that to you.

18 DR. MAKHIJANI: Yes, if you have
19 it in a spreadsheet with the SRDB number and
20 the log book, a name and date --

21 DR. TAULBEE: We can get that.

22 DR. MAKHIJANI: Thank you.

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1 CHAIRMAN GRIFFON: All right.

2 And within that list, if you can
3 -- I mean maybe this will be obvious when we
4 see what you wrote up, but I would assume you
5 would identify the --

6 DR. TAULBEE: I think this is the
7 write-up.

8 (Laughter.)

9 CHAIRMAN GRIFFON: That's the
10 write-up? Okay.

11 DR. TAULBEE: We have a
12 spreadsheet that you can analyze and get this
13 data out of, but it would have the people's
14 names in there.

15 CHAIRMAN GRIFFON: It says here,
16 NIOSH reviewed entries in four bioassay log
17 books covering a period of six years.

18 So if you can --

19 DR. TAULBEE: So we would identify
20 which four bioassay --

21 CHAIRMAN GRIFFON: Right, which
22 four bioassay log books.

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1 DR. TAULBEE: I'm pretty sure
2 that's in the spreadsheet.

3 CHAIRMAN GRIFFON: Oh, yes, and
4 I'm wrong. It's not 200 log books. It's 200
5 log book entries that were looked at.

6 DR. TAULBEE: Yes. Right.

7 CHAIRMAN GRIFFON: So there's only
8 four bioassay log books total?

9 DR. TAULBEE: That we looked at.
10 Oh, gosh, for this --

11 CHAIRMAN GRIFFON: There's a lot
12 of bioassay logs.

13 DR. TAULBEE: Yes, there's 12
14 boxes. In fact, I think it's --

15 CHAIRMAN GRIFFON: Have all those
16 been scanned or they're --

17 DR. TAULBEE: They are all
18 scanned.

19 CHAIRMAN GRIFFON: Oh, they are
20 all scanned? Okay.

21 DR. TAULBEE: Yes.

22 CHAIRMAN GRIFFON: Good.

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1 DR. MAKHIJANI: So, initially, do
2 you want us to be restricted to these four log
3 books?

4 CHAIRMAN GRIFFON: I think you
5 would start there, yes. Yes. Yes.

6 DR. TAULBEE: I thought I had
7 written it down. Oh, there's over 260 log
8 books.

9 CHAIRMAN GRIFFON: Oh, okay. So
10 there are that many.

11 DR. TAULBEE: Yes.

12 CHAIRMAN GRIFFON: It just
13 happened to coincide with the number of
14 entries. All right.

15 I mean what I would ask is, Arjun,
16 that you start with looking at their analysis
17 and looking at the four logs that they
18 considered, but then you might want to also
19 look at the inventory of the 260, you know,
20 like what's out there and what they selected
21 from, was it representative? You know, sort
22 of comment on their methodology.

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1 DR. MAKHIJANI: Okay.

2 CHAIRMAN GRIFFON: That is what I
3 would ask for.

4 DR. MAKHIJANI: Are the other 260
5 also -- so I presume we will need a list of
6 all --

7 CHAIRMAN GRIFFON: Yes. Yes.

8 DR. MAKHIJANI: Okay.

9 DR. TAULBEE: And these log books,
10 by the way, go up to 1989, at which time we
11 have the electronic database. That's when it
12 kicks in.

13 CHAIRMAN GRIFFON: Okay.

14 DR. TAULBEE: So, post-1989, we
15 have everything electronic.

16 DR. MAKHIJANI: Do you want us to
17 do any verification of that electronic
18 database?

19 CHAIRMAN GRIFFON: I think let's
20 take it a step at a time is what I would say.

21 DR. MAKHIJANI: Okay.

22 CHAIRMAN GRIFFON: Let's look at

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1 this first.

2 DR. MAKHIJANI: So we won't do
3 that for now?

4 CHAIRMAN GRIFFON: Yes, and report
5 back to us, yes. And we have got a little
6 time because we are still working on it,
7 waiting on these other coworker models. So
8 maybe we can get some of this work underway,
9 yes.

10 DR. MAKHIJANI: Yes, I think that
11 it clearly may be the biggest single item that
12 we need to review.

13 CHAIRMAN GRIFFON: Right.

14 Now what about external dose
15 validation? I mean you have Number 23. I'm
16 not sure what that covers.

17 DR. MAKHIJANI: Well, this is a
18 question, you know.

19 CHAIRMAN GRIFFON: Right.

20 DR. MAKHIJANI: Because it is
21 connected to this other thing --

22 CHAIRMAN GRIFFON: Yes.

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1 DR. MAKHIJANI: -- about people
2 not wearing badges.

3 CHAIRMAN GRIFFON: Yes.

4 DR. MAKHIJANI: Are we going to go
5 back and do the kind of exercise we did with
6 NTS, where we looked at the potential
7 dosimeters, you know, in a particular period?
8 You know, this can be awfully big or small,
9 depending on how the Work Group chooses to
10 define it. So we definitely need some
11 direction from you about that.

12 CHAIRMAN GRIFFON: Well, I think,
13 for me, anyway, and Brad and others can weigh
14 in, but I think the first step might be those
15 interviews.

16 DR. MAKHIJANI: Okay.

17 CHAIRMAN GRIFFON: Because I would
18 like to see what you've heard.

19 DR. MAKHIJANI: Okay.

20 CHAIRMAN GRIFFON: Is it multiple
21 assertions? I mean I think we need to get a
22 handle on that because I don't want to get too

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1 big too quickly until we find out --

2 DR. MAKHIJANI: Yes.

3 CHAIRMAN GRIFFON: -- exactly what
4 we're -- it seems like this construction work
5 thing is one phenomenon. If you can try to
6 get a sense of the when, like Tim said, and
7 the frequency is what I would ask also. You
8 know, did they constantly do these jobs? Was
9 it two or three times a year? Was it once in
10 their lifetime of working there?

11 DR. MAKHIJANI: Yes.

12 CHAIRMAN GRIFFON: Yes.

13 MEMBER CLAWSON: Well, Mark, this
14 is what I was trying to bring up about how
15 Savannah River is really totally different
16 than other sites because the construction site
17 did an awful lot more than what they ever do
18 on other sites.

19 CHAIRMAN GRIFFON: Oh, yes.

20 MEMBER CLAWSON: Jurisdictional
21 issues and stuff. But, you know, when they
22 were going through this stuff, it surprised

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1 the heck out of me. A lot of times, it was in
2 unison with certain things or they would bring
3 them in for special projects, support the
4 operations. It is really quite, it's
5 different than any site I've --

6 DR. MAKHIJANI: Brad, that might
7 be because, to my recollection, Savannah River
8 was a non-union --

9 MEMBER CLAWSON: Yes. Yes, it is.
10 It is.

11 DR. MAKHIJANI: They didn't have a
12 union saying, you know, this is mine and that
13 is yours. So they didn't have that
14 jurisdictional --

15 CHAIRMAN GRIFFON: Right.

16 DR. MAKHIJANI: It was more fluid
17 for the management to assign people out there.

18 CHAIRMAN GRIFFON: But 23 really
19 gets into the, well it does get into the -- I
20 guess I'm wondering if there's another
21 question on the validity of the external data.

22 I mean we have external coworker models. At

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1 least to some extent you are going to be
2 relying on badge data to develop neutron
3 doses, right?

4 DR. TAULBEE: Yes.

5 CHAIRMAN GRIFFON: Through
6 neutron/photon ratios.

7 Did you do any attempt to validate
8 external versus laboratory records compared to
9 the database records, hard-copy records? I
10 don't even know if they exist, but I'm just
11 asking.

12 DR. TAULBEE: The only electronic
13 is HPAREH that is probably there.

14 CHAIRMAN GRIFFON: Right.

15 DR. TAULBEE: And I'm not sure if
16 it is in there, but I believe it is, where we
17 did look at the printouts that we have.

18 CHAIRMAN GRIFFON: The printouts
19 are --

20 DR. TAULBEE: Those are the hard
21 copy effectively.

22 CHAIRMAN GRIFFON: Right. Are

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1 they just printouts of HPAREH, though?

2 DR. TAULBEE: No, they are not.

3 CHAIRMAN GRIFFON: Oh, okay.

4 DR. TAULBEE: No, they are not.

5 (Laughter.)

6 CHAIRMAN GRIFFON: I was going to
7 say that's not going to help much.

8 Hey, one-to-one match.

9 DR. TAULBEE: No, these are the
10 printouts coming off of the automatic
11 dosimetry readings --

12 CHAIRMAN GRIFFON: Okay. Okay.
13 All right.

14 DR. TAULBEE: -- on a quarterly
15 basis. And they are available on a cycle-by-
16 cycle basis as well, but we only have the
17 quarterly from 1958 forward. We have looked
18 at some individuals, you know, tallying up
19 their annual dose and seeing, did it match
20 HPAREH? Yes. And I thought that was in here,
21 but --

22 CHAIRMAN GRIFFON: No, it might

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1 be. I might have missed that.

2 DR. TAULBEE: But I thought we had
3 done a review of that.

4 CHAIRMAN GRIFFON: So you didn't
5 review the cycle data at all? Or it is at the
6 site, but you didn't bother pulling it down
7 that far?

8 DR. TAULBEE: No.

9 CHAIRMAN GRIFFON: Okay.

10 DR. TAULBEE: We didn't.

11 CHAIRMAN GRIFFON: Okay.

12 DR. TAULBEE: We just pulled the
13 quarterly data. If you look at the quarterly
14 data, it has the last cycle on it. So,
15 effectively, you can --

16 CHAIRMAN GRIFFON: Yes.

17 DR. TAULBEE: -- a little more the
18 detail.

19 CHAIRMAN GRIFFON: Right.

20 DR. TAULBEE: But the quarterly is
21 what was very readily available, and they
22 could burn it to a CD or, actually, multiple

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1 CDs very quickly for us.

2 CHAIRMAN GRIFFON: And this data
3 is also on the O: drive?

4 DR. TAULBEE: The quarterly data
5 is, yes. It's also in the SRDB.

6 CHAIRMAN GRIFFON: Okay. I'm
7 looking for where that is, but I will try to
8 find it later.

9 DR. MAKHIJANI: Did you want us to
10 do a sampling of this now or --

11 CHAIRMAN GRIFFON: Well, I think
12 the same thing would apply. If we can find --
13 I would like to turn you to a certain section,
14 but if NIOSH has done a validation, I would
15 ask the same step as we did with the internal.

16 If SC&A can review their validation and
17 comment on the methodology --

18 DR. MAKHIJANI: Yes, that would be
19 good.

20 CHAIRMAN GRIFFON: -- whether it
21 was broad enough scope, whether it was
22 statistically sound, and et cetera.

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1 DR. MAKHIJANI: Yes, because we
2 did that, I think -- someplace where NIOSH had
3 done their own validation, and then Harry
4 basically looked at how many discrepancies
5 there were or what was the screen.

6 CHAIRMAN GRIFFON: Right.

7 DR. MAURO: Yes. Arjun, we
8 recently discussed that issue on Fernald.

9 DR. MAKHIJANI: Fernald?

10 DR. MAURO: Yes, it was the HIS-20
11 database, and it was solely from the point of
12 view of validating that the hard copy data was
13 faithfully transcribed to the electronic data,
14 and the number of errors that were made in the
15 transcription of the hard copy to the
16 electronic. It didn't get into issues related
17 to the hard copy data itself and whether or
18 not there were problems with it, if you see
19 what I'm saying. In other words --

20 CHAIRMAN GRIFFON: Yes, yes.

21 DR. MAURO: Yes. Okay.

22 DR. MAKHIJANI: That's the

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1 completeness question that we're kind of a
2 little bit punting on right now.

3 CHAIRMAN GRIFFON: Yes, right. I
4 think so. Right.

5 The one question I would have is
6 the pencil dosimeters. I am trying to
7 recollect, but are there log books of that
8 data available? Have you looked at that all?

9 DR. TAULBEE: We have.

10 CHAIRMAN GRIFFON: Yes.

11 DR. TAULBEE: Log books? Not
12 really log books. These are more -- they
13 would have within a particular area the log-in
14 for the kind of sign-in rosters --

15 CHAIRMAN GRIFFON: The sign-in
16 sheets, yes.

17 DR. TAULBEE: -- that would have
18 these thick data. So it varies slightly
19 between different areas as to what they look
20 like.

21 I have seen them. They are
22 typically in with -- filed with the radiation

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1 survey log sheets.

2 CHAIRMAN GRIFFON: Have you
3 crosswalked any of that kind of data? In
4 other words, found an individual and compared
5 their badge data with the PIC readings?

6 DR. TAULBEE: We have not.

7 CHAIRMAN GRIFFON: Yes, I'm not
8 sure it would be that easy, either, because
9 they might have changed out the PICs every
10 day.

11 DR. TAULBEE: They typically
12 change the PICs out on a daily basis.

13 CHAIRMAN GRIFFON: Yes. Then
14 matching it with --

15 DR. TAULBEE: And going through
16 there, I mean we typically use the film badge
17 as the dose of record --

18 CHAIRMAN GRIFFON: Yes.

19 DR. TAULBEE: -- for an
20 individual.

21 CHAIRMAN GRIFFON: No, I
22 understand, but there's particular allegations

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1 that --

2 DR. TAULBEE: That the PICs would
3 be offscale.

4 CHAIRMAN GRIFFON: Yes.

5 DR. TAULBEE: Yes.

6 CHAIRMAN GRIFFON: I mean we know
7 that happens, but --

8 DR. TAULBEE: Right.

9 CHAIRMAN GRIFFON: -- it might be
10 a question of looking at how often it happened
11 and how many times.

12 DR. TAULBEE: I mean I know
13 there's a lot of data down there that we did
14 not capture.

15 CHAIRMAN GRIFFON: Right.

16 DR. TAULBEE: But we captured
17 samples of it. We did not capture complete
18 sets of PIC data.

19 CHAIRMAN GRIFFON: Right.

20 DR. TAULBEE: So if you want to do
21 some validation, you could.

22 CHAIRMAN GRIFFON: Yes.

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1 DR. TAULBEE: We have sufficient
2 that we have captured, but --

3 CHAIRMAN GRIFFON: I think, since
4 there was a specific allegation in the
5 petition, I think we need to follow up on
6 that, is my feeling.

7 DR. MAKHIJANI: Do you want us to
8 do that?

9 MR. KATZ: Just for clarity here,
10 I mean I think, generally, we have agreed that
11 OCAS would do the validation, SC&A would
12 review the validation.

13 CHAIRMAN GRIFFON: Right, right.

14 MR. KATZ: Not SC&A would do it de
15 novo --

16 CHAIRMAN GRIFFON: That is what I
17 was trying to stick to, yes. That's what I
18 was trying to stick to.

19 DR. MAKHIJANI: But OCAS seems to
20 have done sometimes one level of validation.

21 CHAIRMAN GRIFFON: Not on the
22 PICs, though.

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1 DR. TAULBEE: Not on the PICs.

2 CHAIRMAN GRIFFON: Yes.

3 DR. TAULBEE: But just on the hard
4 copy, and I don't see it in here. So now I'm
5 beginning to wonder, did we write it? I don't
6 think we put it in here. So we will need to
7 do that.

8 CHAIRMAN GRIFFON: To follow up on
9 this.

10 DR. MAURO: Mark, this is John.

11 I'm thinking back to when this
12 question came up related to NTS, related to,
13 you know, looking at -- and we had to go back
14 to the log books, and where we would look at a
15 worker and look at where he would log in.

16 Remember, what happens with the
17 PICs is you log in, you log out at each
18 control point. At that point, you record your
19 film, you check out your pencil dosimeter and
20 your film badge.

21 What I'm getting to is we did, on
22 NTS, I think we did about 10 people just to

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1 see if there was any place where things --
2 that was just one way of looking at maybe
3 there's some breakdown of parity. We
4 literally had to look at 10,000 pages of hard
5 copy log book data in order to start to
6 explore whether or not everything sort of rang
7 true.

8 But what I'm getting at is the
9 subject you're talking about is not a small
10 effort.

11 MR. KATZ: For the record, Tim is
12 going to scream right now.

13 DR. TAULBEE: Yes.

14 (Laughter.)

15 CHAIRMAN GRIFFON: No, I would
16 agree with that. We are not tasking you,
17 John, but --

18 DR. TAULBEE: You're tasking me.

19 CHAIRMAN GRIFFON: Yes, yes.

20 (Laughter.)

21 But it is a specific allegation
22 here.

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1 DR. MAURO: No, I just want to
2 alert people, everyone, that I think both
3 NIOSH and SC&A have done this in the past. At
4 least in the case at NTS, it turned out to be
5 a level of effort because of the nature of the
6 records and the change-outs, especially when
7 it comes to the pencil dosimeter.

8 CHAIRMAN GRIFFON: Right. No, I
9 understand.

10 DR. MAURO: Those may be done on a
11 daily basis.

12 CHAIRMAN GRIFFON: Yes, I
13 understand, yes.

14 DR. MAURO: And you could imagine
15 what's involved.

16 DR. NETON: I think, John, what
17 you found out was although there was evidence
18 that it possibly occurred, it wasn't
19 sufficient to bias the overall coworker model
20 that we used for the site.

21 DR. MAURO: Oh, yes. No, in the
22 end --

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1 CHAIRMAN GRIFFON: But that is at
2 Nevada, yes.

3 DR. MAURO: In the end, it was a
4 valuable exercise in that we didn't find what
5 we used to refer to as a smoking gun.

6 CHAIRMAN GRIFFON: Yes.

7 DR. NETON: But I guess what I am
8 saying here is, if you compare this to
9 Savannah River, where I think Tim said 80
10 percent of the people have badge data, and
11 there may be a couple of assertions that this
12 occurred, I mean, is it sufficiently
13 widespread such that it would invalidate any
14 coworker model that were developed, I guess?

15 It wouldn't seem to be worth the
16 effort for now. It would be a lot of effort
17 to go to to validate the assertions.

18 CHAIRMAN GRIFFON: Well, I can't,
19 if you have cycle data, which I know you
20 didn't assess, but you do have cycle data
21 available.

22 DR. TAULBEE: Yes.

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1 CHAIRMAN GRIFFON: I'm assuming
2 that they had monthly monitoring, right? Was
3 the cycle a month or less than a month?

4 DR. TAULBEE: In the earlier
5 years, it was weekly, and then it went to
6 biweekly, and then to monthly.

7 CHAIRMAN GRIFFON: Yes. Okay. So
8 let's go to the limit, which would be monthly,
9 assuming we are trying to be representative
10 over the years. Monthly, you are not going to
11 have more than 20 pieces of paper per worker
12 that you review, in my judgment.

13 DR. TAULBEE: On the film side.

14 CHAIRMAN GRIFFON: No, no, no. On
15 the PIC side.

16 DR. MAURO: On the pencil
17 dosimeter.

18 DR. TAULBEE: No, not necessarily.

19 CHAIRMAN GRIFFON: Why? Are they
20 going to multiple areas in one day with the
21 PIC or --

22 DR. TAULBEE: Especially the

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1 construction trades might spend one week in
2 the 100 area, and then it is a whole separate
3 box of records that we have to pull to go look
4 at their work in the 200 area, and then --

5 CHAIRMAN GRIFFON: To sort through
6 to find them, you mean?

7 DR. TAULBEE: To sort through to
8 find them, yes.

9 CHAIRMAN GRIFFON: Okay. Yes,
10 yes.

11 DR. TAULBEE: To sort through the
12 volume, yes.

13 CHAIRMAN GRIFFON: Yes.

14 DR. MAURO: Yes.

15 CHAIRMAN GRIFFON: So you would
16 have to find the record, I agree.

17 DR. MAURO: Yes.

18 CHAIRMAN GRIFFON: Yes.

19 DR. MAURO: That's what we --

20 DR. TAULBEE: So, literally,
21 you're looking at hundreds of boxes.

22 CHAIRMAN GRIFFON: Yes, yes, that

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1 is the time-consuming part, to find the actual
2 record with that individual on it, yes.

3 DR. MAKHIJANI: You know, Mark, my
4 suggestion would be, you know, we've got this
5 thing of going to the interviews and trying to
6 scope out this problem of weekends and people
7 taking off their badges as a more qualitative
8 level first.

9 CHAIRMAN GRIFFON: Yes, I guess we
10 have to -- I was thinking maybe we could get
11 started with this, but maybe we have to wait
12 until we get more from the interview
13 information.

14 DR. MAKHIJANI: I mean I
15 personally didn't do this work.

16 CHAIRMAN GRIFFON: Yes.

17 DR. MAKHIJANI: But if it is the
18 level of effort that it is going to be, and
19 we've got all this other stuff that's pending
20 anyway --

21 CHAIRMAN GRIFFON: Right.

22 DR. MAKHIJANI: -- it might be

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1 worthwhile to kind of pick this up in a couple
2 of months and see where we are.

3 CHAIRMAN GRIFFON: That's fine,
4 yes. I think we should wait on the interview
5 stuff.

6 MEMBER LOCKEY: Is there a source
7 situation where you should have a correlation
8 between external exposure and internal dose?

9 (Laughter.)

10 DR. NETON: We're smiling because
11 that was at one point -- Nevada Test Site.

12 Not necessarily. I mean it would
13 be, I guess, probably not worth undertaking.
14 I mean it is not -- internal dose, oftentimes,
15 when you get high exposures, people wear
16 respirators and dose goes down. The external
17 exposure might go up.

18 It is true that people that work
19 with a lot of unencapsulated radioactive
20 materials may also have high external doses,
21 but they are not necessarily a one-to-one
22 correspondence.

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1 MEMBER LOCKEY: Because there's
2 too many variables.

3 DR. NETON: Yes.

4 CHAIRMAN GRIFFON: Yes.

5 MEMBER LOCKEY: Okay.

6 DR. MAKHIJANI: And, Jim, at
7 Savannah River Site, I think it would be very
8 area-dependent. The reactors are different.
9 Then you have the processes and the -- I think
10 at Nevada Test Site we were just focused on
11 the testing. At least, you're talking about
12 tests.

13 CHAIRMAN GRIFFON: Yes.

14 DR. NETON: The key is, Arjun,
15 that we need to go back and look at the
16 qualitative nature of these assertions because
17 some of them I've heard are things like --

18 CHAIRMAN GRIFFON: Yes.

19 DR. NETON: -- you know, when they
20 got to the dose limits, they didn't wear their
21 badges, so they could keep working. I mean
22 we've heard this.

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1 CHAIRMAN GRIFFON: These are not
2 new allegations.

3 DR. NETON: Yes, these are not new
4 assertions.

5 CHAIRMAN GRIFFON: Right. We just
6 have to see if it is widespread, is the issue
7 really.

8 DR. NETON: Right. Is it really
9 sufficiently widespread for us to undertake
10 this major review of the entire dataset?

11 CHAIRMAN GRIFFON: Right.

12 DR. NETON: I guess that is where
13 I'm coming from.

14 CHAIRMAN GRIFFON: I agree. I
15 agree. Okay.

16 Is there anything else under 23,
17 Arjun, that I'm missing?

18 DR. MAKHIJANI: No. I think, you
19 know, let's do this, in my opinion, let's do
20 these initial steps and revisit 23 in a couple
21 of months.

22 CHAIRMAN GRIFFON: Okay. And how

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1 about 24?

2 DR. MAKHIJANI: Okay, 24. Yes,
3 now 24 is kind of more a memo item, reminder.

4 I don't think we need to cover it separately
5 now, but, you know --

6 CHAIRMAN GRIFFON: It kind of goes
7 through a lot of your other stuff, yes.

8 DR. MAKHIJANI: Early data was
9 very sparse.

10 CHAIRMAN GRIFFON: Yes.

11 DR. MAKHIJANI: I put it in there
12 just to make sure that we weren't letting a
13 systemic problem of sparseness of early data
14 fall between the cracks.

15 But I would say let's wait for
16 these coworker models, this uranium/plutonium
17 stuff, and so on, and see.

18 DR. TAULBEE: When you say, data
19 are sparse, are you meaning external or
20 internal or both?

21 DR. MAKHIJANI: I was mostly
22 thinking of internal. I would look to Steve.

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1 You know, early on, there were not as many
2 people badged, but I personally have not
3 reviewed the badges.

4 Steve, when we talk about early
5 data, certainly neutron, but you have
6 addressed that separately. I don't know about
7 film badge data.

8 Steve, are you on the line?

9 MR. MARSCHKE: I'm here, Arjun.

10 DR. MAKHIJANI: What about, do we
11 have a question about sparseness of early
12 monitoring data for construction workers for
13 external dose?

14 MR. MARSCHKE: For construction
15 workers in particular?

16 DR. MAKHIJANI: Yes.

17 MR. MARSCHKE: External dose?

18 DR. MAKHIJANI: Yes.

19 MR. MARSCHKE: I'm trying to think
20 about what we did back with OTIB-0052.

21 DR. MAKHIJANI: I can't remember.

22 MR. MARSCHKE: My recollection is

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1 I think the external is in better shape than
2 the internal. I do know that we looked at the
3 Fairweather database, which said additional
4 individuals early in the process, and we found
5 that there the HPAREH database was claimant-
6 favorable relative to what was in the
7 Fairweather.

8 So I think we are in pretty good
9 shape with the external.

10 DR. MAKHIJANI: That's right.
11 There was the Fairweather database, and we
12 explicitly did look at that.

13 MR. MARSCHKE: Yes.

14 CHAIRMAN GRIFFON: That's helpful
15 then, yes.

16 DR. MAKHIJANI: So I don't think,
17 at this stage, I don't think we --

18 CHAIRMAN GRIFFON: So mostly
19 internal, yes.

20 DR. MAKHIJANI: -- want to say
21 that there's a big issue with external. It's
22 mostly internal. I mean that's why I know.

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1 That's why I wrote it.

2 CHAIRMAN GRIFFON: Right.

3 MR. MARSCHKE: We also did some
4 additional studies, again, when we did the
5 paper study back in last December. We did
6 some additional analysis on the external, and
7 it really didn't uncover any major issues, as
8 I recollect.

9 CHAIRMAN GRIFFON: Okay.

10 DR. MAKHIJANI: I can go back and
11 just confirm that for you.

12 CHAIRMAN GRIFFON: That's fine.

13 Then what about 25? That's an
14 environmental --

15 DR. MAKHIJANI: Yes.

16 DR. TAULBEE: And we already
17 talked about it.

18 CHAIRMAN GRIFFON: Which we
19 already talked about, yes. Okay.

20 And my final agenda item was kind
21 of a path forward, but Tim's been nice enough
22 along the way to give us sort of the timing on

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1 all your actions. So I don't know that we
2 have to -- you know, I've written them down.
3 I'll actually try to update the matrix, but I
4 will work with Arjun because you said you were
5 going to update some things.

6 DR. MAKHIJANI: Well, I have to
7 make a couple of corrections, and then I will
8 make some additions and comments and
9 clarifications.

10 CHAIRMAN GRIFFON: I will try, in
11 the final column, to put sort of an action and
12 -- projected delivery dates and things like
13 that in there. If I get them wrong -- I'll
14 circulate them to you two first and make sure
15 I get it right, and then circulate it to
16 everyone.

17 DR. MAKHIJANI: Do you want a
18 column added about status after this Working
19 Group meeting to the matrix, so that Tim can
20 fill in things that he has said and we can
21 kind of log the action items that I have in my
22 notes?

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1 CHAIRMAN GRIFFON: Yes, we can
2 figure out the format. If it doesn't go in
3 that last column currently as you have it,
4 then we can modify it, if we need to.

5 DR. MAKHIJANI: Okay, we can put
6 it in the final column.

7 CHAIRMAN GRIFFON: Yes, I thought
8 it would fit in that current column.

9 DR. MAKHIJANI: Okay.

10 CHAIRMAN GRIFFON: And I will date
11 them as I put them in there.

12 DR. MAKHIJANI: Okay.

13 CHAIRMAN GRIFFON: I have found
14 that helps a lot, if you work through a date
15 and then here's the action, and our status.

16 MR. KATZ: I just want to make
17 sure we have a clear understanding. I mean
18 SC&A was tasked to do a review of the
19 evaluation report and petition. We're going
20 forward in this sort of piecemeal, very task-
21 specific sort of basis.

22 CHAIRMAN GRIFFON: Yes.

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1 MR. KATZ: So, ordinarily, where
2 we would have this big SC&A report, sort of
3 comprehensive report, it sounds like this path
4 forward at this point is really sort of very
5 specific items, as opposed to a general SC&A
6 report. Is that it? I'm just trying to
7 understand how this relates to all --

8 CHAIRMAN GRIFFON: I should say, I
9 guess we need to task SC&A with considering --
10 I would say, this is my idea, would be to go
11 through the whole petition and the ER report,
12 and to the extent anything is not in the
13 matrix currently, then it should be added at
14 this point, you know.

15 DR. MAKHIJANI: It looks like
16 we're doing it. So I am very glad you brought
17 this up.

18 CHAIRMAN GRIFFON: Yes, yes.

19 DR. MAKHIJANI: But I think we
20 now, at this Working Group meeting, I have a
21 pretty good idea that NIOSH believes they have
22 addressed all the issues that were on the

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1 table, that you were doing data recovery for.

2 You have some maybe additional pieces of data
3 that you are analyzing, but there's no sort of
4 large data search or new kind of analysis that
5 you are going to start that you haven't talked
6 about yet.

7 DR. TAULBEE: No.

8 DR. MAKHIJANI: So what I think
9 is, it would be good to proceed on the basis
10 that we are doing a full review --

11 CHAIRMAN GRIFFON: Yes.

12 DR. MAKHIJANI: -- but on certain
13 items to wait until NIOSH publishes --

14 CHAIRMAN GRIFFON: I agree.

15 DR. MAKHIJANI: -- their
16 supplement. So we're not kind of tripping
17 over ourselves.

18 So I think those action items
19 should be memos, but what perhaps I should do
20 is to give you, in addition to this, you know,
21 updating the matrix from this task list and
22 give you an outline to relook at the petition

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1 and our past work, and NIOSH's evaluation
2 report, take into account the status, and give
3 you a little bit of an outline and a timeline.

4 CHAIRMAN GRIFFON: Yes, I think
5 that would be all right. I mean, I guess my
6 feeling was, look at those three components,
7 and even if you said, I mean, even if you
8 identified things but you know that NIOSH is
9 currently working on the model for that, then
10 you don't need to go into a specific finding
11 or anything. Just say discussion is underway
12 with NIOSH or it's already in the matrix and
13 it's being discussed.

14 But I would like to make sure that
15 you've gone through all those things and we
16 don't have some surprise later on.

17 DR. MAKHIJANI: Yes.

18 CHAIRMAN GRIFFON: In other words,
19 we have thoroughly reviewed all of the
20 petitioner's concerns, and they either fit
21 into a current matrix item or we're going to
22 add them on. Do you know what I mean? I want

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1 to make sure we capture the gamut of knowns,
2 yes.

3 DR. NETON: I guess one of my
4 concerns is that SC&A has not formally
5 reviewed the ER against the petition, right?
6 I mean not really formally done that.

7 CHAIRMAN GRIFFON: Yes.

8 DR. NETON: You sort of surmised
9 from your site profile review which ones -- my
10 concerns are that there are certain issues in
11 here that I think we might have addressed in
12 the ER that have gone unnoticed by SC&A.

13 For example, that validity section
14 on the external dose that we did --

15 CHAIRMAN GRIFFON: Yes, yes.

16 DR. NETON: -- it doesn't seem to
17 me that you've actually looked at that or gave
18 us credit for doing that. Do you know what
19 I'm saying? So we are missing some of our
20 crucial --

21 CHAIRMAN GRIFFON: Yes,

22 DR. NETON: -- elements that went

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1 into the ER --

2 CHAIRMAN GRIFFON: Yes, right.

3 DR. NETON: -- that may or may not
4 have been in the site profile?

5 CHAIRMAN GRIFFON: Yes, exactly.

6 DR. NETON: We've generated this
7 document, and it's not really been totally
8 critically evaluated by SC&A.

9 DR. MAKHIJANI: Well, yes, but the
10 main thing I did in putting this thing
11 together, I wasn't involved in all the pieces
12 that needed to be brought together. We did
13 this paper review of the ER, and Steve wrote
14 it. So I kind of used that as the sort of
15 surrogate for our review, our reading of the
16 ER, and putting issues into our matrix.

17 So we've also looked at the
18 petition.

19 CHAIRMAN GRIFFON: Yes.

20 DR. MAKHIJANI: You know, we have
21 got a little table on what is in the
22 affidavits. So we have got bits and pieces of

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1 it. I at least wanted to generate a matrix --

2 CHAIRMAN GRIFFON: Yes.

3 DR. MAKHIJANI: -- so we could
4 start a discussion, since we hadn't actually
5 met in an organized fashion to discuss this.

6 But now I think I have a much
7 clearer idea, and I can actually proceed to
8 produce an outline, update this matrix, and we
9 can proceed with --

10 CHAIRMAN GRIFFON: Yes, as long as
11 the issues are clearly identified.

12 DR. MAKHIJANI: -- reading the
13 petition and the ER more thoroughly.

14 CHAIRMAN GRIFFON: Yes. Yes.

15 MR. KATZ: Yes. Here is my
16 concern: that we have talked about a lot of
17 deliverables from SC&A, based on what
18 materials --

19 CHAIRMAN GRIFFON: Right.

20 MR. KATZ: Some of it, you can't
21 even do until OCAS provides a coworker model,
22 et cetera.

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1 CHAIRMAN GRIFFON: Right.

2 MR. KATZ: But it just seems to
3 me, at the end of the day, we want one rolled
4 up -- we don't really want -- if we have all
5 SC&A's sort of analyses piece by piece, then
6 at the end of the day, one rolled-up analysis
7 is going to be like Swiss cheese. All these
8 other pieces will have been done separately in
9 White Papers. It seems like, for the
10 petitioners and everyone, that one
11 consolidated review of all of this material
12 would be helpful, as opposed to its coming out
13 piecemeal by task, you know, by very sort of
14 specific task.

15 CHAIRMAN GRIFFON: Yes, yes.

16 MR. KATZ: Am I just worried --

17 CHAIRMAN GRIFFON: No, I agree
18 with that. I'm also trying to think, I'm
19 trying to avoid a lot of work being put into
20 something that --

21 MR. KATZ: Before it is ready?

22 CHAIRMAN GRIFFON: Yes. Well, I

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1 could see like 15-20 pages spent on all the
2 different nuclides, and really all we're
3 waiting for is coworker models until we can
4 get anywhere with it. So why should SC&A put
5 a lot of energy into describing --

6 MR. KATZ: Oh, absolutely. That's
7 part of what I'm saying.

8 CHAIRMAN GRIFFON: Right.

9 MR. KATZ: I mean, certainly, they
10 wouldn't go forward with anything until they
11 have the coworker models, for example.

12 CHAIRMAN GRIFFON: Right.

13 MR. KATZ: I mean they wouldn't go
14 forward with those items, but they have been
15 given other items to get started looking at.

16 CHAIRMAN GRIFFON: Yes.

17 MR. KATZ: Again, I am just
18 concerned about the bundling, making that
19 clean --

20 CHAIRMAN GRIFFON: I agree. I
21 agree.

22 MR. KATZ: -- so that everybody

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1 understands everything, so that everybody can
2 understand that review in a sort of
3 comprehensive way.

4 CHAIRMAN GRIFFON: We already had
5 some confusion today because of some issues
6 that SC&A brought up in their extensive TBD
7 review. I mean maybe you can put together a
8 -- I can't emphasize enough -- short report,
9 you know. Even if it crosswalks or I could
10 see it saying, for certain sections, like
11 thorium, SC&A has concerns with blah, blah,
12 blah, a very brief description of some of
13 their concerns about the ability to
14 reconstruct thorium doses. However, we are
15 awaiting NIOSH's coworker model for further
16 review.

17 It sort of holds it there. It has
18 a placeholder. It describes some concerns in
19 brief words.

20 But, then, for other items, it
21 would help me, anyway, for them to say, you
22 know, this issue we believe is an SEC issue; a

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1 robust discussion of this is included in SC&A
2 report Number blah, blah, blah, which is the
3 review of the TBD, you know, pages whatever to
4 whatever.

5 I mean at least crosswalk it, so
6 we know where the detailed description is. I
7 don't know that we need to have them
8 redescribe those things if they are there.

9 And the other thing this does for
10 me is to make sure, for the petitioner, that
11 we don't miss anything that they have raised
12 as concerns as well. I'm not saying you have,
13 but I'm just saying we have it in one concise
14 place.

15 DR. MAKHIJANI: We have kind of
16 started a deeper analysis on certain very
17 limited items where we understood that NIOSH
18 was not doing anything. Like the reason we
19 took up the TIB-0075 claimant data; is it
20 enough? It turns out I was even wrong about
21 that because you are collecting more data,
22 claimant data, and I wasn't aware of it.

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1 CHAIRMAN GRIFFON: Yes.

2 DR. MAKHIJANI: And that came up
3 because sometimes we are kind of doing things
4 in parallel with NIOSH, and by the time we're
5 done, they have something new, and then we
6 have to go back.

7 CHAIRMAN GRIFFON: Yes.

8 DR. MAKHIJANI: But what I would
9 suggest, I think that Ted is right because you
10 don't have a coherent body. You're simply
11 referring to lots of pieces of paper that are
12 not there in one document.

13 And what I would suggest at this
14 stage that might be easiest and what would
15 give some order to my own work in coordinating
16 our team is to update this matrix with a task
17 list, and to look at that, and then take up
18 Jim's suggestion, go through thoroughly once
19 more our work, your work. Take into account
20 what you are doing, and produce an outline of
21 one report, not the report itself. Produce an
22 outline to show where the pieces would be to

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1 reflect the concerns that we have, what their
2 interrelationships are.

3 So that the Work Group can have an
4 idea of how we propose to review the petition
5 and the ER overall.

6 MR. KATZ: Or another possible
7 route, just to sort of consolidate a little
8 bit further, since we know that most of the
9 OCAS material, the coworker models in
10 particular, are going to be delivered, you
11 know, in the April -- I mean there's one that
12 is out in June, but --

13 DR. TAULBEE: June is when the
14 whole thing -- these are interim reports
15 before --

16 MR. KATZ: All of these? Oh, I
17 see, they're all interim. I thought some of
18 them were coming in April, March and April,
19 and so on.

20 In June -- I mean I think SC&A
21 could be working in parallel, but they could
22 deliver a report however many months after

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1 June that actually bundles it all together. I
2 mean, in the meantime, there can be
3 coordination with the Work Group and
4 reporting, and so on.

5 CHAIRMAN GRIFFON: Right.

6 MR. KATZ: But, then, there would
7 be one sort of solid, largely-complete report
8 that comes out of SC&A that takes into account
9 all this work that's ongoing that will have
10 been delivered.

11 Does that make sense?

12 CHAIRMAN GRIFFON: Yes. I guess,
13 Arjun, the crosswalking idea that I was saying
14 might be -- I agree with you. I guess I just
15 was saying that maybe the better notion is cut
16 and pasting. I just didn't want to see a lot
17 of new work going into something that's
18 already been out there for analysis, you know.

19 So, if you are done and then say, here's our
20 review, don't recreate the wheel. Just maybe
21 place it in the same document.

22 DR. MAKHIJANI: Yes.

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1 CHAIRMAN GRIFFON: And I think you
2 can provide -- I mean, my feeling is you
3 shouldn't -- we can probably ask for more than
4 an outline at this point. We can ask for a
5 first draft report, and you just put
6 placeholders where --

7 DR. MAKHIJANI: We can put
8 placeholders, yes. I said outline because --

9 CHAIRMAN GRIFFON: NIOSH is
10 developing a coworker model here, blah, blah,
11 blah, you know, so this is underway.

12 Yes. Okay, I think we're all kind
13 of sensing where things --

14 DR. TAULBEE: I know one document
15 would help me out a lot, to have it all in one
16 place.

17 CHAIRMAN GRIFFON: Yes.

18 MR. KATZ: It also brings order to
19 what people see, and for the public.

20 CHAIRMAN GRIFFON: And for the
21 public, right. Right, right.

22 MR. KATZ: Yes, the public. For

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1 the public, this must be murder otherwise.

2 CHAIRMAN GRIFFON: Yes.

3 MR. KATZ: Yes.

4 MEMBER CLAWSON: Let me ask a
5 question.

6 CHAIRMAN GRIFFON: That sounds
7 good. We'll have Brad help you write that
8 out.

9 (Laughter.)

10 MEMBER CLAWSON: Yes, I'll get it
11 to the point, oh, yes.

12 CHAIRMAN GRIFFON: He'll get me
13 back on Fernald.

14 (Laughter.)

15 MEMBER CLAWSON: Do you plan on
16 doing any more document retrieval, or
17 whatever?

18 DR. TAULBEE: No.

19 MEMBER CLAWSON: So you've got all
20 the documents that you have?

21 DR. TAULBEE: That is correct,
22 with I guess the one caveat, I would say, is

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1 if you want us to go back and look at the
2 pocket ionization-type chain of data --

3 CHAIRMAN GRIFFON: Yes, right.

4 DR. TAULBEE: -- that would be a
5 huge undertaking and a massive data capture.

6 MEMBER CLAWSON: Well, the reason
7 why I am asking this is because I am kind of
8 having a hard time following -- we have
9 retrieved a lot of this data, but the data
10 isn't on the O: drive, or so forth, like that.

11 DR. TAULBEE: All of it is.

12 MEMBER CLAWSON: It's all on the
13 O: drive?

14 DR. TAULBEE: Yes, it is.

15 MEMBER CLAWSON: Okay. Because I
16 keep hearing people refer to a K: drive.

17 DR. TAULBEE: Well, it's the same
18 drive.

19 CHAIRMAN GRIFFON: Yes.

20 DR. TAULBEE: It's just, on our
21 end, it shows up as the K: drive. On your
22 end, it shows up --

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1 CHAIRMAN GRIFFON: A different
2 nomenclature.

3 MEMBER CLAWSON: Okay, because
4 they say, oh, you must not have that because
5 it is on the K: drive. I will flop it over.

6 DR. TAULBEE: The same drive.

7 MEMBER CLAWSON: Okay. So there's
8 no more data retrieval that's going to have to
9 be done on that?

10 DR. TAULBEE: No, and it is all up
11 there. It has all been loaded. We have SRDB
12 numbers for everything that we have captured.

13 MEMBER CLAWSON: Okay. When we
14 look at that, those pages of numbers, is there
15 any way that anything that has a little more
16 description besides just going to each one to
17 see what it is?

18 DR. TAULBEE: I recognize your
19 frustration. Let me talk about it back with
20 the folks at NIOSH to try to see if we can't
21 do something a little better.

22 MEMBER CLAWSON: Okay.

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1 DR. TAULBEE: I agree. I have the
2 same frustration.

3 CHAIRMAN GRIFFON: Yes, yes.

4 DR. TAULBEE: I have started
5 entering it into my own kind of separate
6 database, just so I can re-find things.

7 MEMBER CLAWSON: When I'm finding
8 them, I'm switching them over to a file on
9 mine.

10 CHAIRMAN GRIFFON: This is a five-
11 year issue, but, yes.

12 MEMBER CLAWSON: But there's more
13 issues there. When you look at 60 of these
14 files that are all the same except one
15 number --

16 CHAIRMAN GRIFFON: Yes.

17 DR. MAKHIJANI: Can't they bring
18 the old system back?

19 (Laughter.)

20 CHAIRMAN GRIFFON: That's a policy
21 decision. That would take a while, Arjun.

22 (Laughter.)

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1 DR. MAKHIJANI: No, because all
2 the titles, when you went into the database,
3 all the titles showed up, the numbers showed
4 up, and you could see the first page, all at
5 the same time. And you had an instant idea
6 whether you wanted to look at something or
7 not.

8 DR. NETON: Tim and I both hear
9 your concerns.

10 (Laughter.)

11 MEMBER CLAWSON: I believe it's, I
12 feel your pain, yes.

13 CHAIRMAN GRIFFON: Okay. Anything
14 else for today's meeting? I think we are
15 ready to wrap up.

16 MR. KATZ: What about scheduling?

17 CHAIRMAN GRIFFON: Scheduling our
18 next meeting?

19 MR. KATZ: Just in terms of,
20 generally, do you have an idea of when it
21 makes sense?

22 CHAIRMAN GRIFFON: I don't know.

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1 I think I am going to hold off and work --
2 I'll update the matrix and work with Arjun and
3 Tim a little more, and if enough things are
4 coming out, you know, it might make sense
5 before June, but that's pushing it off a ways,
6 you know.

7 MR. KATZ: Yes.

8 CHAIRMAN GRIFFON: My hope would
9 be to have one like midway from here to June,
10 you know.

11 MR. KATZ: Yes, and it seems like
12 somewhere April/May.

13 CHAIRMAN GRIFFON: But only if we
14 can get something done. So I don't want to
15 set a date yet or pick dates.

16 MR. KATZ: No, I wasn't asking for
17 a date.

18 CHAIRMAN GRIFFON: Right, right.

19 MR. KATZ: Just sort of a time
20 frame.

21 CHAIRMAN GRIFFON: Also, my
22 feeling is, if we don't schedule something

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1 March/April, then we are going to be re-
2 talking about these same issues again next
3 time. So I would like to keep the frequency a
4 little more timely than other meetings we have
5 had.

6 MR. KATZ: I agree.

7 CHAIRMAN GRIFFON: Because you
8 lose your momentum on it.

9 MR. KATZ: Yes.

10 DR. TAULBEE: I would think the
11 beginning of April we should have both the
12 thorium projects out as well as the neutron.

13 CHAIRMAN GRIFFON: Okay. So
14 possibly the beginning of April. Let's maybe
15 think about that, and I'll get specific dates
16 around when we get closer.

17 MR. WARREN: Mark, this is Bob
18 Warren.

19 I wasn't clear who has the
20 responsibility for deciding who were the
21 construction workers plus, for the other
22 workers. How do you define construction

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1 workers and who is going to do that?

2 CHAIRMAN GRIFFON: Well, we are
3 waiting because SC&A has a report that is
4 being reviewed right now by DOE.

5 MR. WARREN: Okay.

6 CHAIRMAN GRIFFON: So we are
7 waiting to get that on the table where we can
8 all look at it. But that does talk about the
9 construction worker versus non-construction
10 worker.

11 DR. MAKHIJANI: Yes, we do that,
12 but we don't define --

13 CHAIRMAN GRIFFON: As far as how
14 to identify them, I think we have to look at
15 that from NIOSH's report a little more. The
16 description today by Tim, as I understand it,
17 they do have some identifiers, payroll
18 identifiers, that help them to define. But I
19 haven't looked at their overall report on
20 that. So I think we will consider that when
21 we get SC&A's report back, too.

22 MR. WARREN: Okay. Because

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1 delivery drivers, laundry people, escorts for
2 construction workers, there is a whole list
3 that has been put in as part of this petition.

4 CHAIRMAN GRIFFON: Okay. I know
5 that NIOSH indicated to me that they have a
6 listing -- you can share that, right? -- a
7 listing of payroll IDs and job types. We will
8 make sure that is made available to the
9 petitioner as well, right?

10 MR. WARREN: That would be real
11 helpful.

12 CHAIRMAN GRIFFON: Yes, so you can
13 crosswalk that. And if you have any insights
14 that you want to share with us, that would be
15 great.

16 MR. WARREN: Thanks so much.

17 CHAIRMAN GRIFFON: Sure.

18 Okay, anything else?

19 (No audible response.)

20 All right. Anything on the phone, John?

21 DR. MAURO: Yes, I'm still here.

22 CHAIRMAN GRIFFON: Well, have you

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1 got a final thought for the day?

2 DR. MAURO: Nope.

3 CHAIRMAN GRIFFON: No? You're
4 speechless?

5 (Laughter.)

6 DR. MAURO: I'm speechless.

7 CHAIRMAN GRIFFON: Nothing about
8 the Jets? No prediction for the Jets?

9 DR. MAURO: Oh, I'm really
10 excited, I've got to tell you.

11 CHAIRMAN GRIFFON: Yes, they're
12 going down to Manning, though.

13 DR. MAURO: Yes, I know. They've
14 got their hands full.

15 CHAIRMAN GRIFFON: All right. On
16 that note, I guess we are ready to adjourn.

17 DR. MAURO: Take care.

18 CHAIRMAN GRIFFON: Thanks for
19 sticking with us, people on the phone.

20 (Whereupon, the above-entitled
21 matter went off the record at 2:46 p.m.)

22

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