

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

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

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ADVISORY BOARD ON RADIATION AND  
WORKER HEALTH

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SAVANNAH RIVER SITE WORK GROUP

+ + + + +

WEDNESDAY  
MAY 5, 2010

+ + + + +

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

PRESENT:

MARK GRIFFON, Chairman  
BRADLEY P. CLAWSON, Member  
MICHAEL H. GIBSON, Member\*  
JAMES E. LOCKEY, Member\*  
PHILLIP SCHOFIELD, Member

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ALSO PRESENT:

2

TED KATZ, Designated Federal Official  
NANCY ADAMS, NIOSH contractor\*  
MEL CHEW, ORAU Team  
HARRY CHMELYSKI, SC&A\*  
EMILY HOWELL, HHS  
JENNY LIN, HHS  
MIKE MAHATHY, ORAU Team  
ARJUN MAKHIJANI, SC&A  
STEVE MARSCHKE, SC&A  
JOHN MAURO, SC&A\*  
ROBERT MORRIS, ORAU Team\*  
JIM NETON, DCAS  
BILLY SMITH, ORAU Team\*  
TIM TAULBEE, DCAS  
ROBERT WARREN, Petitioner\*

\*Participating via telephone

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1 P-R-O-C-E-E-D-I-N-G-S 4

2 9:34 a.m.

3 MR. KATZ: So good morning, and  
4 welcome everyone in the room and on the line.

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

7 My name is Ted Katz. I'm the Designated  
8 Federal Officer for the Advisory Board, and  
9 we're just getting started here.

10 We'll begin as usual with roll  
11 call for everyone on roll call with the  
12 agencies and contractors. Please specify  
13 whether you have a conflict of interest issue  
14 here with the Savannah River Site, and we'll  
15 begin with Board Members in the room with the  
16 Chair.

17 Introduction of Board Members and  
18 Participants

19 CHAIRMAN GRIFFON: Mark Griffon,  
20 no conflict on Savannah River.

21 MEMBER SCHOFIELD: Phil Schofield,

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1 Work Group Member. No conflict on Savannah  
2 River.

3 MEMBER CLAWSON: Brad Clawson,  
4 Work Group Member, no conflict.

5 MR. KATZ: And then Board Members  
6 on the line?

7 MS. LIN: Jim Lockey, Board  
8 Member, no conflict.

9 MR. KATZ: Welcome Jim.

10 MEMBER GIBSON: Mike Gibson, Board  
11 Member, no conflict.

12 MR. KATZ: Welcome Mike. Any  
13 other Board Members on the line?

14 (No response.)

15 MR. KATZ: Okay. NIOSH ORAU Team  
16 in the room.

17 DR. NETON: Jim Neton, NIOSH, no  
18 conflict.

19 DR. TAULBEE: Tim Taulbee, NIOSH,  
20 no conflict.

21 DR. CHEW: Mel Chew, ORAU Team, no

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1 conflict.

6

2 MR. MAHATHY: Mike Mahathy, ORAU  
3 Team, no conflict.

4 MR. KATZ: And on the line, NIOSH  
5 ORAU Team?

6 MR. SMITH: Billy Smith, ORAU  
7 Team, no conflict.

8 MR. MORRIS: Robert Morris, ORAU  
9 Team, no conflict.

10 MR. KATZ: Thank you and welcome.  
11 SC&A team in the room?

12 DR. MAKHIJANI: Arjun Makhijani,  
13 no conflict.

14 MR. MARSCHKE: Steve Marschke,  
15 SC&A, no conflict.

16 MR. KATZ: SC&A team on the line?

17 DR. MAURO: John Mauro, SC&A. I  
18 am conflicted.

19 MR. KATZ: Okay, and now HHS and  
20 other government officials or contractors in  
21 the room.

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1 MS. HOWELL: Emily Howell, HHS. 7

2 MS. LIN: Jenny Lin, HHS.

3 MR. KATZ: And then the same on  
4 the line, HHS, other government officials or  
5 contractors to the government?

6 MS. ADAMS: Nancy Adams, NIOSH  
7 contractor.

8 MR. KATZ: Welcome, Nancy. And  
9 then now there are no members of the public in  
10 the room. But on the line, any members of the  
11 public or petitioners who want to self-  
12 identify?

13 MR. WARREN: This Bob Warren,  
14 representing Johnny Williams, one of the  
15 petitioners.

16 MR. KATZ: Welcome, Bob. All  
17 right then. Let remind everyone on the line,  
18 please mute your phones. Use the \*6 button if  
19 you don't have a mute button, and when you  
20 want to speak to the group, \*6 again will take  
21 you off of the mute.

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1                   Please do not put the phone on  
2 hold at any time. Just start back in, because  
3 the hold will disrupt the call. We have an  
4 agenda we put out. It should be on the NIOSH  
5 website and was also, I hope, distributed to  
6 participants. Mark?

7   Agenda

8                   CHAIRMAN GRIFFON: Yes. I'm not  
9 sure if everyone got the agenda, but I'll  
10 briefly go over it now. We are going to start  
11 the meeting with a presentation by NIOSH.  
12 There's an addendum to the SEC Evaluation  
13 Report, and Tim will start us off with that.

14                                       Then we're going to go back to the  
15 matrix that we've been working from. The  
16 emphasis will be on -- there were a number of  
17 actions that we came out of our last meeting.

18                   I think the last meeting was in January, and  
19 there were a number of action items.

20                                       We're going to focus certainly on  
21 where progress has been made on those actions,

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1 and those include primarily -- we'll go  
2 through them, all of the matrix items. But  
3 the focus, apparently where the most progress  
4 has been made, is on issue number 4, 6, 7, 10,  
5 12, 13, 15, 16 and 23. So we may touch on the  
6 other ones, but more focus will be on those.

7 And certainly the addendum, I  
8 think, covers issue 1 as well. I should say  
9 that. So with that in mind, and then  
10 certainly I know the petitioner is on the  
11 line, you know. We certainly will have time  
12 for comments from you all, and look forward to  
13 your participating in the meeting.

14 I guess with that, I'm going to  
15 let Tim start it off with the presentation of  
16 this addendum to the Evaluation Report. Tim,  
17 just to clarify, this was recently posted but  
18 it's not available publicly, right?

19 DR. TAULBEE: That is correct.  
20 This was just posted to the Advisory Board  
21 Members and SC&A last night once it was

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1 approved. This has been submitted to DOE for  
2 the final ABC review before public release.

3 We expect to get that back within  
4 the next week or two, at which time we'll post  
5 it on our website and send a copy to  
6 petitioners, all of them, of this final  
7 report.

8 CHAIRMAN GRIFFON: Okay. So  
9 members of the public and the petitioners  
10 should be able to see this soon on the  
11 website, or get a copy sent to them, right?

12 DR. TAULBEE: Right. Well the  
13 petitioners will get a copy sent to them.

14 CHAIRMAN GRIFFON: Yes.

15 DR. TAULBEE: Other members of the  
16 public can get --

17 CHAIRMAN GRIFFON: Can get it  
18 online, right. Okay.

19 DR. MAKHIJANI: I guess I'm not on  
20 the email list. Where are -- is it posted on  
21 the O: drive?

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1 CHAIRMAN GRIFFON: On the O:  
2 drive.

3 DR. TAULBEE: Yes, it's under  
4 Advisory Board on Radiation and Worker Health,  
5 under Document Review, and then there's SEC --

6 DR. NETON: On the AB Document  
7 Review.

8 CHAIRMAN GRIFFON: And those on  
9 the line on the -- other Board Members, we're  
10 all just finding this right now, so it's not  
11 something that I didn't circulate in time. It  
12 was just posted, I believe, last night or  
13 yesterday some time. So if you have your  
14 access to your O: drive, you might want to  
15 pull it out now.

16 I might ask that Tim, if you could  
17 also email the presentation that you're going  
18 to do today to the Members. It might be a  
19 helpful summary of it.

20 DR. TAULBEE: Sure.

21 CHAIRMAN GRIFFON: Okay. I'll let

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1 Tim start. Tim Taulbee. 12

2 NIOSH Presentation

3 DR. TAULBEE: Thank you, and as  
4 Mark mentioned, this is the addendum to the  
5 SEC 103. If you recall back in December 2008,  
6 we had reserved the thorium section of the  
7 Special Exposure Cohort Evaluation Report for  
8 thorium for those early time periods, because  
9 we were concerned about our level of  
10 information and our level of knowledge as to  
11 what was happening at that time.

12 So we reserved it at that time,  
13 continued to do more research. So this is the  
14 summary of our additional work and research.  
15 Just take it back to slide 20.

16 So instead of going through the  
17 entire ER again, what I'm going to focus on a  
18 little bit is give a brief overview of the  
19 process descriptions, particularly tailoring  
20 it to thorium, talk a little bit about the  
21 Savannah River Site data with respect to

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1 thorium, the pedigree of it, and then the  
13  
2 feasibility of dose reconstruction. Then  
3 we'll wrap up with some conclusions here.

4 Next slide. Okay. So to remind  
5 you all of the Savannah River operations, the  
6 primary mission was to produce plutonium and  
7 tritium at the site. That was their main  
8 function during the Cold War, and these were  
9 materials used for nuclear weapons. Another  
10 function was to manufacture tritium  
11 reservoirs.

12 A third function was isotope  
13 production, and this is where the thorium  
14 comes into play. They produced isotopes for  
15 heat sources, polonium and plutonium 238,  
16 radiation sources, cobalt 60, for example, and  
17 then transplutonium isotopes such as curium  
18 244 and californium 252.

19 Under these additional isotope  
20 production, one of their functions was to  
21 produce uranium 233. So to produce uranium

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1 233, you irradiate thorium 232. So that's  
2 part of the process of making it. So that's  
3 what I'm going to be focusing on in this  
4 particular presentation, is that thorium work.

5 Next slide. So the five main  
6 areas of the site are the 100 area, those are  
7 the reactors, the 200 areas, those were the  
8 separations canyons, F and H canyons. The 300  
9 area was a fuel and target fabrication, and  
10 then 400 was heavy water production, 703 was  
11 research and development.

12 The reason the 300's highlighted  
13 here is the targets is what we're really  
14 talking about here. What they were  
15 manufacturing and fabricating with regards to  
16 thorium were thorium targets to be irradiated  
17 in the reactors, and then the uranium 233 will  
18 be separated from the thorium 232.

19 The separations for this early  
20 time period that I'm talking about did not  
21 take place at Savannah River. In later years

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1 it did, in the mid-1960's and later. But in <sup>15</sup>  
2 the 1950's, all of the irradiated thorium was  
3 sent to Oak Ridge National Laboratory. So  
4 there wasn't any separation in that other time  
5 period.

6 Once the targets were fabricated,  
7 they were in sealed cans. So there wasn't any  
8 exposure then at the reactors. So in this  
9 early time period, what we're looking at is  
10 the exposure in the 300 area.

11 Next slide. So the time period  
12 what we've identified during this, I think in  
13 the original petition, we indicated pre-1960.

14 During our further research, we found that  
15 from 1953 through 1965, they were doing  
16 basically the same work with the thorium  
17 metal.

18 1960, the reason we had cut it off  
19 initially, was the whole body counter came  
20 online, and we were expecting that there was  
21 going to be whole body count information. So

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1 that was why we reserved it at that time. 16

2 However, what we found though is  
3 from '53 to '65, it was all thorium metal  
4 work. All of the work was very similar. So  
5 we decided to combine it and expand that  
6 evaluation time period, if you will, for this  
7 thorium work.

8 In the 300 area, it was thorium  
9 metal canning. Most of this was done at  
10 Sylvania, and I'll get more into details about  
11 in a minute. In the 700 area, there was some  
12 metallography work that was going on, where  
13 they would take small samples of them and  
14 slice them and do inspection between the  
15 cladding and the metal work.

16 As I indicated before, all of the  
17 irradiated thorium was sent off site during  
18 this particular time period. The later time  
19 period, '65 to '71, where there was more  
20 uranium 233 production, this was with thorium  
21 powder. This was a totally different

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1 operation that was being done, and we're  
2 handling it separately from an exposure  
3 standpoint, and an evaluation standpoint.

4 This was also a glove box  
5 operation that was done, and we've written --  
6 we have a draft of Report 46, which will  
7 address this dose reconstruction method. We  
8 expected both these reports to come out at the  
9 same time.

10 It looks like the Report 46 is  
11 going to lag by about a week. So within the  
12 next few weeks, you should be seeing Report 46  
13 as well, which will handle the second area of  
14 operation.

15 For the separations, which is this  
16 later time period, during the separation, the  
17 purpose wasn't to recover the thorium, it was  
18 to recover the uranium 233. Uranium 233 went  
19 through B lines, which are glove box lines.

20 The thorium nitrate, the first  
21 batch was actually pumped directly into the

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1 tank farms, and all of the other batches were<sup>18</sup>  
2 then loaded directly into railroad cars,  
3 railroad car tankers and sent to Fernald.

4 So this process, I guess it will  
5 be under the Report 46, what I'm going to  
6 focus on today is the factory.

7 Next slide. So let's look at  
8 these pre-1965 operations. Well, in canning,  
9 what you have is you're taking a bare slug of  
10 metal, and you're sticking it in an aluminum  
11 can and then welding the end caps, and then  
12 pressure-testing it and doing other tests to  
13 make sure it's held its containerization.

14 So the thorium canning and uranium  
15 canning in the 300 area were very similar  
16 operations. Basically, they were identical.  
17 They also had similar work controls as well,  
18 although from documentation that we have, it  
19 looks like that they were a little more  
20 concerned about the thorium than they were the  
21 uranium.

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1                   So in 1955, they dropped the  
2 maximum permissible concentration in the air  
3 down from 1 x times ten to the minus 11 to  
4 two times ten to the minus 12 microcuries per  
5 centimeter cubed. So they were taking a  
6 little more precautions with the thorium.

7                   In addition, the Health Physics  
8 log books, if you go through and read them,  
9 they were concerned about the external dose  
10 rates coming from these thorium slugs. If  
11 they get too many of them on a cart for their  
12 inspection, they were concerned about the dose  
13 rates.

14                   So they limited the number that an  
15 individual inspector would be working with.  
16 Then the test authorization for some of these,  
17 the canning processes, indicated that surfaces  
18 should be covered with paper and the paper  
19 discarded and the can shipped. So it does  
20 appear that the thorium was controlled a  
21 little better than what the uranium was during

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1 this time period. Next slide. So let me talk<sup>20</sup>

2 --

3 DR. MAKHIJANI: Can I ask a  
4 question about the concentration limit. Go  
5 back. If you can go back. Is that 1 times  
6 ten to the minus eleven about the same as what  
7 was being used at other sites for uranium?

8 DR. TAULBEE: I don't know about  
9 other sites, but this was the limit for  
10 uranium.

11 DR. NETON: I'm pretty sure that's  
12 what it was.

13 DR. TAULBEE: So let me talk a  
14 little about the 300 area, the time line of  
15 operations starting in that area. June of  
16 1951 is when construction began in the 300  
17 area, and August of 1952 is when the 313  
18 building, this was the main canning building  
19 at Savannah River, was declared an exclusion  
20 area.

21 So this was the introduction of

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1 radioactive material into the area in August<sup>21</sup>  
2 1952. They began operations a month later,  
3 effectively official operations, although  
4 there was quite a bit of shakedown going on  
5 and additional working of the equipment.

6 The first thorium introduction or  
7 campaign, if you will, was in January of 1953,  
8 January to March of 1953. This is really  
9 experimental type of levels, and I wouldn't --  
10 I'm not even sure I would call it R&D at this  
11 point, because there was 320 slugs that they  
12 manufactured, and they sent that to Hanford.

13 The Savannah River reactors were  
14 not operational at this time yet. So a  
15 dispersed grouping of 320 slugs went to  
16 Hanford. At the end of this time period,  
17 March '53 is when NBS Handbook 52, which was  
18 the first national internal exposure guidance  
19 came out, the same month as when the first  
20 radiological control procedures came out for  
21 Savannah River there in the 300 area.

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1                   In November 1953 was the start of  
2                   uranium, routine uranium bioassay program in  
3                   the 300 area. So now in June 1954 is really  
4                   when the first research and development work  
5                   for thorium canning began at Savannah River,  
6                   and at that time, what they were doing was  
7                   they were experimenting between two different  
8                   processes.

9                   One of them was called the dipping  
10                  method, the aluminum silicate dipping method,  
11                  and the other was the hot press bonding  
12                  method. Aluminum silicate dipping method was  
13                  done at Savannah River, and the hot press  
14                  bonding was done at Sylvania.

15                 So during this time period,  
16                 Savannah River did 1,700 thorium slugs and  
17                 Sylvania did another portion, although I don't  
18                 have it here on the slide, what number they  
19                 did, and they were comparing the two, which  
20                 one was better from a ceiling next to the edge  
21                 of the can.

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1                   And so this was really the R&D<sup>23</sup>  
2 phase if you will, and the reason I say that  
3 is 1,700 slugs. January 1955 to August 1955  
4 they decided on the Sylvania process, hot  
5 press bonding. At that time, they started  
6 making 26,000 slugs. So you see a huge ramp-  
7 up now. They tested two methods; they found  
8 the one that they liked and worked the best,  
9 and they went with it. So here's where  
10 production really began in June of 1955 --  
11 January 1955, sorry.

12                   There was another campaign out  
13 here in 1957. Next slide. So let me talk a  
14 little bit about this dipping method. This is  
15 actually a photograph of the interior of the  
16 canning room, 1956. This was demonstrating  
17 the dipping method, and like I said, what you  
18 do is you take a slug, put it in an aluminum  
19 can.

20                   You would dip it in an aluminum  
21 silicate bath and what you wanted is for the

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1 aluminum silicate to go down in between the <sup>24</sup>  
2 sleeve of where the thorium was and the  
3 outside of the can, just make a better heat  
4 seal, so that when you put it in a reactor,  
5 with the metal expansion you get better heat  
6 transfer across the boundary.

7 And so the other components of  
8 this was if you go to put the thorium slug  
9 inside the can and it doesn't fit initially,  
10 you might have to do some additional lathing.

11 So we have some air sample data, 1954, when  
12 they were doing that, during that testing  
13 phase, some of the lathing, and we have air  
14 sample data from that.

15 And you would do the dipping and  
16 then you'd weld the end caps on, and then  
17 acceptance testing, pressure testing and  
18 various other tests would be conducted. So as  
19 I mentioned, in 1955, the hot press bonding  
20 method developed by Sylvania was found to be  
21 far superior. They were getting much better

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1 acceptance testing. 25

2 The dipping method was resulting  
3 in I believe over 50 percent failures or 50  
4 percent unacceptable slugs. So they went with  
5 the Sylvania process. At that time, SRS  
6 switched more to a finishing mode, welding the  
7 end caps on and inspecting of the slugs that  
8 Sylvania actually encapsulated or canned.

9 Next slide please. So if you look  
10 at the whole production process, the number of  
11 thorium slugs, and I mentioned the 320 way  
12 back here in 1953 that were done, the 1,700  
13 that were done.

14 This was using the dipping method,  
15 and then here's where you started full-scale  
16 production of 26,000 done, being canned at  
17 Savannah River or not canned at Savannah  
18 River, but canned at Sylvania Electric  
19 Products and then finished at Savannah River.

20 What's important to look at here,  
21 if you look at the number of uranium slugs

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1 versus the thorium slugs, as to how much<sup>26</sup>  
2 thorium work were they doing compared to  
3 uranium, and clearly they were doing a whole  
4 lot more uranium work, to the point of even  
5 here in 1955, only two percent of the work was  
6 actually thorium. Two percent of all of the  
7 slugs canned were thorium.

8 If look at later years, the  
9 highest in 1963, where about four percent. So  
10 in all of the years in doing this thorium  
11 metal work, 95 percent or greater of the work  
12 was uranium canning in that time period, using  
13 similar controls, although the thorium seems  
14 to be controlled a little better.

15 And so this is what got into our  
16 mode of how we were going to estimate the  
17 actual doses.

18 Next slide. So let me talk  
19 briefly here about the data pedigree. All of  
20 this data is --

21 CHAIRMAN GRIFFON: Just one

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1 question on the previous table. You show the <sup>27</sup>  
2 ramp-up, which I understand. But then all of  
3 the sudden you have several zeroes. I mean  
4 this is obviously a batch type -- I mean --

5 DR. TAULBEE: Oh absolutely.  
6 Batch type operation.

7 CHAIRMAN GRIFFON: So it wasn't  
8 like a scale-up and then drop off. It was --

9 DR. TAULBEE: No. These were  
10 campaigns. These were short campaigns of we  
11 need 5,200 slugs over these three months.  
12 We're going to can some thorium.

13 CHAIRMAN GRIFFON: And you're  
14 confident in the data? It's not that there's  
15 missing reports or data? It's that actually  
16 nothing happened in those years.

17 DR. TAULBEE: That is correct.  
18 Nothing happened. In fact, we've even checked  
19 the reactor production logs, and you can see  
20 them being canned, being shipped to various  
21 reactors, the number of slugs irradiated in L

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1 versus K, and then shipped off site. 28

2 CHAIRMAN GRIFFON: Thanks.

3 DR. TAULBEE: So all of the data  
4 that we've got here all came from original  
5 source, original sources. We have the thorium  
6 bioassay log book, which I mentioned during  
7 the original presentation at SRS, at the  
8 December of 2008 Board meeting.

9 We have uranium bioassay logs. We  
10 have more of them from '53 beyond '65, but the  
11 ones we used for this analysis were '53  
12 through '65, uranium and thorium air sample  
13 log sheets. We also have radiation survey  
14 sheets, Health Physics log books, and then all  
15 of our process information came from those  
16 monthly reports.

17 You can track where the material  
18 is going and how much of it, based upon these  
19 actually weekly, monthly and quarterly  
20 reports.

21 DR. MAKHIJANI: Is this data

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1 compiled somewhere that we can see? 29

2 DR. TAULBEE: All of it is in the  
3 SRDB, and all of the data as well, if you look  
4 at the references on the ER addendum,  
5 everything is referenced. So yes, all of this  
6 documentation is available.

7 DR. NETON: One, just another  
8 comment. Yesterday, I don't know if you're  
9 aware, there's a new version of the SRDB out  
10 there.

11 DR. MAKHIJANI: Since yesterday?

12 DR. NETON: No.

13 DR. MAKHIJANI: It's pretty each  
14 to search now. It's much better than --

15 DR. NETON: Okay. The one that  
16 gives the title of the documents and  
17 everything.

18 DR. MAKHIJANI: The complaints are  
19 gone.

20 (Simultaneous speaking.)

21 DR. MAKHIJANI: Yes, it's much

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1 better. Before it was unuseable. Now it's 30

2 DR. TAULBEE: You can see the  
3 titles of the documents.

4 DR. MAKHIJANI: Yes, right. It's  
5 much better than before.

6 DR. TAULBEE: Yes. So as I  
7 mentioned, all of these are original source  
8 term documents, handwritten. They've been in  
9 the Federal Records Center probably for 50 to  
10 60 years now, I guess 50 years.

11 So these -- from these sheets,  
12 data was coded for analysis, and we'll  
13 certainly provide you any of those  
14 spreadsheets that you want to look at. It's  
15 not a problem. Next slide. So --

16 DR. MAKHIJANI: And you have those  
17 in hard copy. They're not liked scanned or  
18 anything?

19 DR. TAULBEE: Oh, no, no, no.  
20 They are all -- everything is scanned.

21 DR. MAKHIJANI: Oh, okay.

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1 DR. TAULBEE: Everything has been scanned.  
2 scanned. In fact, everything coming from  
3 Savannah River has to be scanned.

4 DR. MAKHIJANI: I was just  
5 wondering if you could provide a copy, if you  
6 have hard copies?

7 DR. TAULBEE: Oh no. Savannah  
8 River has an interesting, or different from  
9 other sites, to where they will scan  
10 everything and provide it to us. Part of the  
11 reasoning is is they have the EDWS system,  
12 which I think you're familiar with.

13 So they are purposely trying to  
14 make all of their documents electronic. So  
15 this gives them an excuse to scan an entire  
16 box of records.

17 So since the uranium and thorium  
18 canning inspections were similar, the uranium  
19 bioassay is what we're going to use to  
20 estimate and reconstruct thorium intakes. So  
21 the basing methodology is we have uranium

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1 bioassay. It was recorded in units of mass<sup>32</sup>  
2 per unit volume in urine, and based upon this  
3 concentration, using the ICRP models and IMBA,  
4 we can back out what the uranium mass intake  
5 was.

6 Here's where we assume a 1 to 1  
7 ratio of uranium mass intake to thorium mass  
8 intake. So they're doing the same work with  
9 uranium as they are with the thorium. We have  
10 the uranium bioassay. We're backing out how  
11 much uranium they breathed in.

12 So assuming a 1 to 1 ratio, trying  
13 to estimate the thorium based upon that mass,  
14 not activity, and go through and calculate the  
15 thorium dose. If I were doing an  
16 epidemiologic study, this particular point  
17 right here, I'd go back to that table, be  
18 multiplying by those fractions.

19 Four percent for that one year, .1  
20 percent for another year, to get what I would  
21 consider a best unbiased estimate. Now in our

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1 program, we can't rule out that if an <sup>33</sup>  
2 individual worker, his only work was during  
3 one of those thorium campaigns, so therefore  
4 we're assigning this massing 1 to 1 ratio.

5 This is a very claimant-favorable  
6 assumption in doing so, considering the volume  
7 --

8 DR. NETON: Okay. Let me see if I  
9 understand this. It wasn't clear to me when I  
10 read this the first time, and now it's  
11 becoming clear, is it's not only a 1 to 1 --  
12 we're saying the dust loading for uranium and  
13 the dust loading for thorium are going to be  
14 effectively equivalent because they're similar  
15 processes.

16 We're going beyond that and saying  
17 that the air concentration of thorium would  
18 have been that way the entire year --

19 DR. TAULBEE: That's correct.

20 DR. NETON: Even though 95 percent  
21 of the time or greater during that year, it

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1 would have been a uranium -- 34

2 DR. TAULBEE: That's correct.

3 DR. MAKHIJANI: And you're going  
4 to assign a uranium dose based on the same  
5 data as well?

6 DR. TAULBEE: Yes.

7 MR. MARSCHKE: For the years where  
8 there was no thorium production, are you going  
9 to assume zero for the thorium for those  
10 years, I assume, or are you going to give them  
11 a dose for those years as well?

12 DR. TAULBEE: We're lumping it all  
13 together into bands, and you'll see that from  
14 the uranium data here in just a minute. So we  
15 will be assigning during that. I mean that's  
16 something that we could, you know, discuss and  
17 potentially not assign it.

18 If this group feels that that's,  
19 you know, important, we can certainly do that.

20 DR. NETON: If you can back up.  
21 We're talking about double-assigning the

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1 uranium and thorium? I'm not sure -- I think<sup>35</sup>  
2 we would take the highest of the two intake  
3 scenarios, wouldn't we?

4 DR. TAULBEE: Well for one thing,  
5 we have uranium bioassay for these people. So  
6 if somebody has uranium bioassay in that time  
7 period, we're going to assign their dose to  
8 uranium based their bioassay.

9 DR. NETON: Right.

10 DR. TAULBEE: And this is  
11 estimating what's their thorium dose. So  
12 there, we're taking the coworker effectively  
13 for the uranium, to estimate what the thorium  
14 is, we'd be assigning the thorium dose.

15 DR. NETON: If you're using a  
16 coworker model, and this is -- I like to call  
17 this a substitute model, not a surrogate model  
18 so there's no confusion here, but if you're  
19 using the model, it seems that you would pick  
20 the -- you don't know what the person was  
21 exposed to because you have no bioassay on

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1 him.

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2 MR. MARSCHKE: For thorium.

3 DR. NETON: For thorium.

4 DR. TAULBEE: We do for uranium.

5 DR. NETON: Oh, I see. Yes, we'd  
6 have to work through the --

7 MR. MARSCHKE: Yes. What if we  
8 have the -- we have a guy who has no bioassays  
9 for either?

10 DR. TAULBEE: Well, for either.  
11 Then we would, in my opinion and Jim please  
12 step in, we would assign both, in my opinion.

13 DR. NETON: I'm not sure.

14 CHAIRMAN GRIFFON: -- both 100  
15 percent of the time, I see here.

16 DR. TAULBEE: Yes. I mean it  
17 seems there's sort of a logical system, but --

18 DR. MAURO: Whoever's speaking,  
19 get a little closer to the microphone. The  
20 main speaker, I'm not even sure who that is, I  
21 can barely hear you. You know, it's very hard

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1 to hear.

37

2 DR. NETON: I think this is a  
3 situation where we can sort of become a victim  
4 of our attempts to be claimant-favorable.  
5 Realistically, what Tim was talking about  
6 earlier, what you do every study, probably  
7 makes the most sense.

8 I mean you fractionate it based on  
9 the percentage of time. I mean you couldn't  
10 assume that the processing --

11 CHAIRMAN GRIFFON: But then I see  
12 that going there too, you don't know who might  
13 have worked more in the thorium processes or  
14 whatever.

15 DR. NETON: Well, but  
16 realistically, though, it's related the number  
17 of slugs canned per year, and so unless there  
18 was a very large discrepancy in the processing  
19 time for a thorium slug versus a uranium slug,  
20 if you have five percent that are thorium  
21 slugs being processed, then really you can

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1 and there was uranium in the same rooms. 39

2 DR. NETON: The processes were not  
3 similar. We don't really know what the  
4 process was for thorium.

5 DR. TAULBEE: Exactly.

6 DR. NETON: That was sort of an  
7 experimental process of Y-12, remember, where  
8 300 pounds dropped on the floor. We had no  
9 monitoring. This is so very unique in the  
10 sense that these were both canning operations  
11 to can slugs for reactors. So I mean this is,  
12 I think, somewhat unique.

13 CHAIRMAN GRIFFON: It's definitely  
14 different.

15 DR. TAULBEE: Yes, and Jim's got  
16 it nailed dead-on. The process is what  
17 matters, is the most important thing here. We  
18 know uranium canning and the thorium canning  
19 were the same, whereas at Y-12, what were they  
20 doing with the canning versus what were they  
21 doing with uranium.

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1                   We know now with the thorium, that<sup>40</sup>  
2 they were doing the same processes for the  
3 same purpose in the same buildings. Okay.

4                   MEMBER CLAWSON:     So Tim, can I  
5 just add one. When these thorium campaigns  
6 came up, they were still doing the uranium too  
7 though?

8                   DR. TAULBEE:     Absolutely.

9                   CHAIRMAN GRIFFON:         And I'm  
10 assuming that the methodology we're laying out  
11 here would only be used in the years that you  
12 have known processing, like if you weren't  
13 doing -- right.

14                  DR. TAULBEE:     Absolutely. Well  
15 that's why we made the break in 1965, was the  
16 thoria process, the powder, the whole process  
17 completely changed.

18                  Instead of working with uranium  
19 metal now, they're working with the thorium  
20 powder, and they actually built a glove box  
21 line in order to work with that. So we're

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1 only applying this when they were doing the<sup>41</sup>  
2 exact same process.

3 DR. MAKHIJANI: Initially, you  
4 were, if I'm recalling correctly, you were  
5 going to use air concentration and bioassay  
6 data for thorium. That was a suggestion  
7 anyway. Am I remembering that right?

8 DR. TAULBEE: You're correct, and  
9 I'll get to that here in a minute.

10 DR. MAKHIJANI: Oh, okay.

11 DR. TAULBEE: I'll get to that.

12 DR. NETON: We reviewed the data.

13 DR. TAULBEE: Oh, sorry. I was  
14 trying to move this closer, because John Mauro  
15 was saying he was having trouble hearing me.  
16 Is it better now?

17 CHAIRMAN GRIFFON: John, can you  
18 hear Tim Taulbee?

19 DR. MAURO: It's -- well yes.  
20 Tim, if you can get a little -- I can hear Jim  
21 Grace and everyone else and you, Mark. But

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1 I'm having trouble hearing Tim. 42

2 CHAIRMAN GRIFFON: Yes. We don't  
3 have a lapel, like, you know, microphone.  
4 When he's standing up with his presentation.  
5 That's probably why.

6 DR. MAURO: Oh, I see.

7 CHAIRMAN GRIFFON: We'll work on  
8 it a little bit.

9 DR. NETON: Maybe you can just sit  
10 down and speak from the slides.

11 CHAIRMAN GRIFFON: Yes.

12 DR. TAULBEE: Oh, I can do that.  
13 Sure.

14 DR. NETON: It's good for effect,  
15 but --

16 DR. TAULBEE: Okay. I can do  
17 that. John, is this better?

18 DR. MAURO: Oh, that's better.  
19 Thank you.

20 DR. TAULBEE: Okay, thanks. All  
21 right. So the first step of that was modeling

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1 uranium intakes. So we went through and<sup>43</sup>  
2 modeled all of the years from 1953 to 1965,  
3 and you'll see that in ER addendum, and what  
4 I'm showing up here on the slide now is the  
5 uranium mass for 1955 and 1960, just to give  
6 two of the examples here.

7 And our modeling was we took the  
8 maximum sample per person per year. So if  
9 somebody had four bioassay samples, four  
10 uranium bioassay samples in a year, we took  
11 the largest and threw them into the coworker  
12 model.

13 So if they had two non-detects and  
14 then two positive detects, of the two  
15 positives we took the highest. So from 1955,  
16 what you'll see is the following distribution.

17 There are 486 people monitored in  
18 the 300 area for that particular year. It  
19 fits a log normal distribution quite nicely,  
20 with the geometric mean of 1.97 and a  
21 geometric standard deviation of 1.7.

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1                   Now as we got into later years~~4~~  
2                   the radiological controls got better, because  
3                   people -- all of the doses or all of the  
4                   intakes started decreasing. It's very clear  
5                   to see, and I'll show that in the next slide.

6                   So what we had in the second slide in 1960,  
7                   we only had 58 of the 456 people that had  
8                   positive bioassay in that latter time period.

9                   So in order to fit this, we used a  
10                  two distribution assumption, where there's an  
11                  underlying population that will be the same as  
12                  the missed dose or non-detectable population,  
13                  overlaid with a detectable population. So we  
14                  fit this particular alignment along this line.

15                 Which TIB is this?

16                 DR. NETON: I was going to say.  
17                 There's a TIB. I can't remember the name of  
18                 it. This is one that Tom LaBone is working on  
19                 for us. I don't remember. Is that what you  
20                 used? I was going to ask pathologically?

21                 DR. TAULBEE: Yes, yes. It was

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1 pathologic. 45

2 DR. NETON: This is the  
3 assumption. You have two, an underlying  
4 distribution of zero exposures that would have  
5 its own normal distribution, with a log normal  
6 distribution superimposed on that normal  
7 distribution you'd expect from people that had  
8 no exposure.

9 DR. NETON: It's a TIB.

10 DR. TAULBEE: OTIB-0076. Okay.  
11 So when you fit all of the years of the data  
12 that we have --

13 DR. NETON: Let me go back. I  
14 think one thing to point out, that this is a  
15 very low intake potential situation. These  
16 are very low doses. They weren't really  
17 working directly much with the thorium metal  
18 at this point or the uranium, right? These  
19 were just cans that were used were sealed up.

20 DR. TAULBEE: That's correct, and  
21 most of the canning was being done at

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1           Sylvania. 46

2                       DR. NETON:       That's important, I  
3           keep forgetting.   This is not like a lathe  
4           operation or --

5                       DR. TAULBEE:   Now in the earlier  
6           years it was, and in fact you'll see that on  
7           this particular draft right here.  If you look  
8           in the 1953 down to 1956 time period, you'll  
9           see a steady decrease.  There was a lot of  
10          lathing going on in those earlier years,  
11          particularly '54, '55, and you'll see that the  
12          uranium intakes were rather significant during  
13          that time period.

14                      And but then by the time we get to  
15          about 1957, it kind of levels off.  More of  
16          the actual canning is being done at Sylvania,  
17          and they were doing more of an inspection  
18          role.

19                      Then we get to 1963, and it  
20          increases again, and I believe that this is  
21          due to the    re-introduction effectively of

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1 Savannah River beginning to do a share, <sup>4</sup>~~7~~  
2 larger fraction of the canning.

3 DR. MAKHIJANI: Now this is  
4 thorium data or uranium data?

5 DR. TAULBEE: This is all uranium.  
6 Yes, this is all uranium.

7 DR. MAKHIJANI: Why would uranium  
8 data follow the thorium canning production in  
9 here?

10 DR. TAULBEE: Because they were  
11 doing the -- Sylvania also canned a lot of  
12 uranium for them as well, not just the  
13 thorium.

14 DR. MAKHIJANI: They were doing no  
15 uranium canning production at the Savannah  
16 River Site?

17 DR. TAULBEE: No, they were doing  
18 some, but it was a decreased role. They were  
19 contracting out more of that particular work.

20 So you see that with the bioassay, in that  
21 the exposures dropped during this time period.

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1                   And this is why we feel that this<sup>48</sup>  
2                   is the best method for estimating the thorium,  
3                   is because it would be tracking along what the  
4                   uranium production is doing as far as  
5                   contracting, inspection and number of slugs  
6                   and that type of thing. Okay.

7                   So, based upon those uranium mass  
8                   intakes, assuming the one-to-one ratio, we  
9                   calculated out the intakes of thorium. So if  
10                  you look at the Type S, this is what we're  
11                  proposing to assign, 1953 would be 347  
12                  picocuries per day, because the exposures were  
13                  quite high due to uranium there.

14                  So we are assuming that the  
15                  thorium exposures would be quite high, doing  
16                  the same process. 1954 drops to 175. '55,  
17                  '56, it's an average of about 80, and then '57  
18                  to '62, it's dropped way down to about 4.7,  
19                  4.8. And then '63 to '65, it comes back up.

20                  So this is what we're proposing to  
21                  assign for the thorium intakes during this

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1 time period. Again, due to the similar<sup>49</sup>  
2 operations between thorium and uranium, we  
3 feel this is a reasonable method of estimating  
4 the doses.

5 Similar radiological work  
6 controls. We have indications that the  
7 thorium is actually controlled a little  
8 tighter than what the uranium was.

9 So in order to verify this, we did  
10 look at some air sample data. How do these  
11 compare during this time period? We  
12 interviewed, actually, the person who took the  
13 air samples. He's still around, and one of  
14 the things that he indicated was that routine  
15 air samples were representative of the  
16 breathing zone of the worker.

17 They were located where the  
18 operators were standing, and they were not  
19 mounted on walls. So we felt that we could  
20 look at the air sample data then and compare  
21 between the thorium air samples and the

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1 uranium air samples. 50

2 And so we took, it was 30 thorium  
3 air samples, 33 uranium air samples. There  
4 are literally thousands of uranium air samples  
5 that we have captured, and you'll see in the  
6 SRDB.

7 Mike went through and extracted  
8 the ones where there's uranium and thorium in  
9 the same buildings at the same general time  
10 periods, so that we can compare the two  
11 results.

12 Basic hypothesis testing, that  
13 whether the thorium mass was less than the  
14 uranium mass, and there's no statistical  
15 difference between these two distributions  
16 that we can find here, doing a standard T test  
17 and the T value is .238.

18 So we don't have any evidence to  
19 refute that these two operations were similar.

20 The air samples are showing similar mass  
21 loadings. So from that, we are using the

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1 assumption that we can use the uranium<sup>51</sup>  
2 bioassay, the mass bioassay, to estimate the  
3 thorium intakes.

4 So now here comes to Arjun's  
5 question there of what happened to the thorium  
6 bioassay and the thorium air sample results.  
7 Well, if you look at the thorium bioassay,  
8 none of the thorium bioassay results from 1956  
9 to 1957 were positive, none of them.

10 And so, using a minimum detectable  
11 activity of .5 DPM per day, we can extrapolate  
12 to an air concentration of 34 picocuries per  
13 meter cubed, which is much greater than the  
14 maximum per square concentration by their test  
15 procedures, by the test authorization  
16 procedure and by their radiological controls  
17 in the area.

18 This would result in a 650  
19 picocurie per day intake, if we were to try  
20 and use the thorium bioassay. Basically, it's  
21 showing that the air concentration would have

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1 had to have been, what is that, almost <sup>20</sup>~~52~~  
2 times the maximum permissible concentration  
3 before you would see anything.

4 So it really wasn't a feasible  
5 method for monitoring the thorium at that time  
6 period. They tried, but it just wasn't  
7 sensitive enough.

8 MEMBER CLAWSON: So you're saying  
9 the process was that they couldn't just, they  
10 couldn't see the thorium samples?

11 DR. NETON: It's a typical thorium  
12 bioassay. It's a very insensitive indicator  
13 of intake, worse than plutonium. Not much  
14 comes out in the urine when you inhale  
15 thorium. Not much comes out -- plutonium is  
16 even worse than thorium.

17 DR. MAKHIJANI: So basically you  
18 have all -- the thorium bioassay is all less  
19 than minimum detectable, detectable at .5 DPM.

20 DR. TAULBEE: Right.

21 DR. MAKHIJANI: A detection limit

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1 of .5 DPM?

53

2 DR. TAULBEE: Right.

3 CHAIRMAN GRIFFON: What was the  
4 detection limit? I'm sorry.

5 DR. TAULBEE: .5 DPM for thorium.

6 CHAIRMAN GRIFFON: There it is,  
7 okay.

8 DR. NETON: Which is not a bad  
9 detection rate.

10 CHAIRMAN GRIFFON: Right, right.

11 DR. TAULBEE: But 650 picocuries  
12 per day, and that was what their missed dose  
13 was. That was effectively due to that  
14 process. So if you look at the air sample  
15 data that we just did, and you look at the  
16 mean mass concentration, you get 6.4  
17 micrograms per meter cubed.

18 There was .7 picocuries per meter  
19 cubed, which is still -- the mean is less than  
20 the maximum permissible air concentration  
21 value that they were using to control the

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1 workplace at the time, why they were taking<sup>54</sup>  
2 those samples, and that was at two picocuries  
3 per meter cubed.

4 And if you go through all of the  
5 air sample data, I think there was only -- air  
6 samples. There's only one, maybe two samples  
7 out of that 30 that were slightly above MPC,  
8 and one of them was like 2.2. I think that's  
9 the highest.

10 So, you know, from the air control  
11 standpoint, they were controlling it down to  
12 here below the MPC. Using the MPC then as  
13 your intake value, as to what your daily  
14 intake would be, and you get 19.2 picocuries  
15 per day. However, if you look back at the  
16 uranium mass methodology that we're proposing,  
17 '55 to '56, we're proposing 80 picocuries per  
18 day, which is much above this, significantly  
19 above this maximum permissible concentration.

20 You've got to remember that we're  
21 basing this on the uranium, for one, and the

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1 uranium was controlled at a much higher level<sup>55</sup>

2 In fact, it would be about a factor of five  
3 higher, yes, from the activity standpoint.

4 So, you know, we feel that this  
5 80.4 was probably high, but reasonable from  
6 that standpoint, certainly a lot more  
7 reasonable than 650 picocuries a day for an  
8 intake.

9 In the central time period of '57  
10 to '62, we know the uranium exposures were  
11 rather low. So that we're assuming the  
12 thorium exposures were rather low during that  
13 time period, and so it's significantly below  
14 what you would assign based upon the MPC.

15 Then in that latter time period,  
16 '63 to '65, it jumps back up a little, to  
17 where we're on about the same order of  
18 magnitude, the same scale.

19 And so we feel the uranium mass  
20 methodology is the best method for doing this,  
21 because it's going to track more of what we

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1 see with uranium data, since the processes<sup>56</sup>  
2 were the same. We did look at thoron  
3 concentrations as well, and this is where I  
4 learned a lot during this process, I'll tell  
5 you.

6 Normally, when you think air  
7 sample data, you kind of assume that what's on  
8 your -- what's being collected on your filter  
9 is a much longer activity than with -- you  
10 know, you can ignore the decay while it's on -  
11 - well, during sampling.

12 Jim pointed out you can't,  
13 correctly so. So we took the air sample data  
14 where we had two counts at known times. We  
15 decay corrected during sample. This is the  
16 lead 212, and then decay-corrected from the  
17 stop of sampling to the start, or the first  
18 count.

19 This results in a multi-equation  
20 solution. This is Appendix C that we have  
21 there in the ER addendum. It goes through all

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1 of the mass, all the three equations, ~~the~~<sup>57</sup>  
2 three unknowns.

3 We come up with the geometric mean  
4 of 13.1 picocuries per meter cubed, and GST of  
5 1.78 and resulting intake of 126 picocuries  
6 per eight-hour shift for thoron.

7 So overall, our conclusion is is  
8 that we've determined we have sufficient  
9 personal monitoring data, source term  
10 information and workplace monitoring data for  
11 thorium to allow adequate bounding of the  
12 total potential internal exposures at the site  
13 during this time period.

14 Consequently, NIOSH finds that  
15 it's feasible to estimate with sufficient  
16 accuracy the radiation doses resulting from  
17 internal thorium exposures received by members  
18 of the Class.

19 And I should have acknowledged  
20 earlier, but Mike Mahathy did the lion's share  
21 of all of this here. So thank you very much

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1 Mike, and Mel's team and Mel himself helped<sup>58</sup>  
2 out a lot. So we'll be happy to answer any  
3 questions that you all have. Oh, and Billy  
4 Smith, yes.

5 DR. NETON: A quick note of  
6 clarification. Liz Brackett just emailed me  
7 and indicated that this Report 44 that  
8 actually describes the method for analyzing  
9 bioassay data, which is simply a fraction less  
10 than that.

11 DR. TAULBEE: Okay. You did 44?

12 DR. NETON: Oh yes, Report 44.

13 CHAIRMAN GRIFFON: Report 44.

14 DR. TAULBEE: Sorry about that.

15 DR. NETON: Yes. The OTIB-0075 is  
16 the use of NOCTS data --

17 CHAIRMAN GRIFFON: I don't even  
18 know if we looked at the report.

19 DR. NETON: It's a good report.

20 DR. TAULBEE: Any questions?

21 MEMBER CLAWSON: Where is

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1 Sylvania? 59

2 DR. TAULBEE: Where is Sylvania?

3 Where are they? Sylvania Electric Products.

4 It's one of the SEC, not SEC --

5 (Simultaneous speaking.)

6 DR. MAKHIJANI: Isn't Sylvania in

7 Long Island?

8 DR. NETON: No. They were near

9 New York City.

10 DR. CHEW: Bob would know the

11 answer. Bob? Remember, I think you looked at

12 the Sylvania. Do you remember where that was?

13 Are you on the line?

14 MR. MORRIS: Yes. This is Robert

15 Morris. Sylvania's in New York.

16 DR. CHEW: Okay.

17 MEMBER CLAWSON: Okay. I had some

18 --

19 DR. CHEW: Thanks Bob.

20 DR. TAULBEE: They're one of the

21 As.

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1 CHAIRMAN GRIFFON: Or AWEs. 60

2 DR. TAULBEE: AWEs, thank you.

3 MEMBER CLAWSON: Okay. I just was  
4 wondering, because I hadn't heard about that.

5 CHAIRMAN GRIFFON: An initial  
6 question from me is why, and I think you might  
7 have -- the way you've grouped them might  
8 answer this, but why were there no zero intake  
9 years, because that's the question I asked  
10 earlier, was, were you're going to apply this  
11 methodology consistent with the production  
12 numbers that you have, where you show that  
13 it's very much batch-wise, and even though the  
14 uranium urinalysis levels dropped off, they  
15 didn't go to zero.

16 But the production of thorium did  
17 go to zero. So is this to account for like  
18 residual or -- ?

19 DR. TAULBEE: Effectively, yes,  
20 although you know, from reading the test  
21 authorizations at the end of each shift, they

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1 would just gather up the paper and so forth.<sup>61</sup>  
2 But I think the exposure potential is very low  
3 during that time period. If there is any  
4 residual thorium around, sure, maybe. But the  
5 doses they were assigning in that time period  
6 are pretty small, .4.

7 CHAIRMAN GRIFFON: Are low, yes,  
8 right.

9 DR. TAULBEE: So out of  
10 convenience in a sense, it might be easier to  
11 just go ahead and assign it. We could go  
12 through here with this table in the years that  
13 there wasn't any campaign and not assign a  
14 dose. We could certainly do that.

15 CHAIRMAN GRIFFON: Right. But  
16 then you'd have the opposite question, which  
17 is, wasn't there any residual material? Yes.

18 DR. TAULBEE: Yes, exactly.

19 MR. MAHATHY: You've got on the  
20 thorium production, the campaign beginning in  
21 '64. When we added '65 to the count for,

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1 including renewables, then you can see your <sup>62</sup>  
2 thorium added.

3 CHAIRMAN GRIFFON: All right.

4 DR. TAULBEE: When you go through  
5 the log books, even after a campaign, you  
6 might find several months later where they do  
7 some surveys on the outsides of them, where  
8 they had some that were just sitting off to  
9 the side or something, and then they would  
10 move them off. So there is --

11 The campaigns are actually the  
12 production, the heart of the production. It  
13 doesn't mean that they weren't sitting  
14 somewhere off to the side and they go through  
15 for housekeeping and, you know, let's send  
16 these all off or strip the sides off or  
17 something.

18 CHAIRMAN GRIFFON: I mean, that's  
19 the other question I have, was, I did find  
20 while you were presenting, I looked for the  
21 uranium urinalysis logs, and you do have the

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1 reference IDs in the reference list, which <sup>is</sup><sub>63</sub>  
2 very helpful.

3 So they're easy to find on the  
4 SRDB. But I noticed they're all uranium logs,  
5 but you did mention that you at least looked  
6 at the thorium data. Are those logs on the  
7 SRDB as well and do we have references? Are  
8 they easy to search? I mean, if I looked for  
9 thorium urine logs or thorium bioassay?

10 MR. MAHATHY: You have the -- is  
11 given in the original.

12 CHAIRMAN GRIFFON: In the original  
13 ER document, okay. All right, all right,  
14 because those might be worth -- I'm thinking a  
15 SC&A review. I think obviously this one is  
16 going to have to go for a normal review. We  
17 just received this, so -- but if you have any  
18 preliminary questions, Arjun or Steve or John.

19 DR. NETON: I don't see Report 44.  
20 I don't see a Report 44 in the report to  
21 this.

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1 DR. MAKHIJANI: So Mark, when you  
2 review this, we knew we would be going along  
3 with reviewing the 1076 and the Report 44  
4 along with it?

5 CHAIRMAN GRIFFON: Well, I don't  
6 know if TIB-0076 applies anymore. I think  
7 it's this Report 44.

8 DR. TAULBEE: It's just Report 44.

9 CHAIRMAN GRIFFON: Yes, that we  
10 have to find. But yes, I would say yes. Not  
11 in a procedures review format, but you're  
12 going to have to be familiar with it to do the  
13 review, I imagine. Yes, yes.

14 DR. MAKHIJANI: No. There won't  
15 be a separate document.

16 CHAIRMAN GRIFFON: Right, right,  
17 right.

18 MR. MARSCHKE: We were just given,  
19 under the Procedures Subcommittee, we were  
20 just given a report to review. I'm just  
21 trying to look up now and see which report. I

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1 think it might have been 44. We're just<sup>65</sup>  
2 trying to look and see.

3 DR. NETON: It probably was,  
4 because --

5 DR. TAULBEE: Here it is.

6 MR. MARSCHKE: I'm trying to --  
7 I don't remember --

8 DR. NETON: If you're talking --  
9 it's in our -- it's on our K: drive. I don't  
10 know that --

11 (Simultaneous speaking.)

12 CHAIRMAN GRIFFON: One person at a  
13 time, please. I'm going to help out the --

14 DR. NETON: You got that right off  
15 the O: drive.

16 CHAIRMAN GRIFFON: Actually, I got  
17 it off my hard drive.

18 DR. MAKHIJANI: Yes, I mean  
19 there's no hurry. If you could put it in that  
20 -- I don't see it in the --

21 MR. MARSCHKE: It's available

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1           someplace, Arjun. 66

2                     DR. MAKHIJANI:    Yes.

3                     MR. MARSCHKE:    Actually, I've gone  
4           back to the Subcommittee, the Procedures  
5           Subcommittee meeting minutes that were held  
6           back in March. We were assigned the review of  
7           Report 44, and I believe John Mauro has  
8           assigned that to Joyce, to take a look at.

9                     DR. NETON:    It's definitely in our  
10           list of documents on our drive.

11                    DR. MAKHIJANI:    Okay, yes.    No  
12           problem. I just wanted --

13                    CHAIRMAN GRIFFON:    Okay.    It's  
14           there somewhere.

15                    DR. NETON:    So that's nice timing  
16           actually. That works out well.

17                    CHAIRMAN GRIFFON:    So do you have  
18           any -- John, this is open to you too, any  
19           preliminary thoughts, comments or --

20                    DR. MAURO:    No, nothing to offer.

21                    CHAIRMAN GRIFFON:    Okay.

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1 DR. MAKHIJANI: I think my biggest  
2 dilemma here is I think there's a -- I still  
3 think that it's worthwhile to look at the  
4 consistency question, because we've gone  
5 through a lot of situations where we had  
6 uranium and thorium.

7 And I understand the logic that  
8 Jim and Tim were talking about, that we know  
9 the process here. But I think it is  
10 worthwhile thinking about the consistency, not  
11 having usable thorium data and, also, I guess  
12 we've talked a lot in other contexts about the  
13 reasonableness of a bounding dose, and that  
14 kind of --

15 If you have orders of magnitudes  
16 lower production, a population dose at least  
17 might be orders of magnitude lower. And then,  
18 how is it reasonable to assign a dose that's  
19 basically a population dose that's two orders  
20 of magnitude greater than what your best  
21 estimate is?

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1 DR. NETON: You see, that's why I  
2 don't quite understand why you couldn't  
3 apportion it based on production.

4 DR. MAKHIJANI: I don't think you  
5 can apportion it based on production.

6 DR. NETON: Because it's a  
7 percentage of -- if it takes x amount of  
8 seconds to process one slug, and you have that  
9 many slugs to produce, then it seems logical  
10 that you could only spend four percent of your  
11 time processing thorium slugs, right? I mean  
12 that's --

13 CHAIRMAN GRIFFON: Right, and  
14 you're assuming the work force stays  
15 consistent for that whole -- that's the  
16 assumption. I mean, what if some, what if 20  
17 people were brought in specifically for  
18 thorium processing for a couple of years or  
19 whatever?

20 DR. NETON: Right. But my point  
21 is though, if it's x amount of time per unit

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1 slug production, then it's proportionate. If  
2 you have a million widgets made and 50,000 of  
3 those widgets are of one flavor and 950,000  
4 the other, your dose can't -- your dose should  
5 be proportionate to the number of widgets made  
6 in that category.

7 DR. MAKHIJANI: The dose -- the  
8 population dose to the workers will be  
9 proportionate. So I agree with Tim on that,  
10 that if you're trying to do an approximate  
11 approach to an epidemiological study for that  
12 group of workers, you'd assign it proportional  
13 to the production.

14 But the individual dose certainly,  
15 and we have argued this in other contexts,  
16 that you could have a very small production.  
17 You can take here, right here in Ohio, if you  
18 look at the records of that no records field,  
19 where you look at the production conditions in  
20 the uranium subcontract that was given by  
21 Fernald to a small shop near Oxford, I doubt,

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1 I doubt that you could say that -- you know,  
2 they only produced about 200 tons in that  
3 shop, if I'm remembering correctly. But I  
4 doubt that you could say that you could make  
5 it proportional.

6 DR. NETON: But this is one  
7 process facility using the same equipment, the  
8 same process, see, that's what I'm saying. So  
9 that if, you know, if you process -- let's say  
10 you process 100 of something in a year and  
11 that took you all year to do that, and I only  
12 did ten of these in that particular year, it  
13 would seem to me that they'd only occupy ten  
14 percent of your time collectively.

15 MR. MARSCHKE: I agree basically  
16 with -- I go kind of in the middle ground, I  
17 think, because you've either got to spend all  
18 your time processing -- there could be one guy  
19 processing all 50,000 thorium slugs.

20 DR. NETON: Right, but it wouldn't  
21 have taken him --

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1                   CHAIRMAN GRIFFON:       It wouldn't  
2                   have taken him a full year.

3                   DR. NETON:     That's my point.

4                   MR. MARSCHKE:   But he would have  
5                   -- however long it took him to do it, I mean  
6                   he would have -- he could have spent the whole  
7                   year processing thorium slugs.   But then he's  
8                   not going to have any uranium exposure.   So  
9                   he's --

10                  DR. NETON:     No, no, no.    But see  
11                  my point is, why would it take him an entire  
12                  year to process 1,726 thorium slugs, when they  
13                  could do 500,000 uranium slugs in one year?

14                  MR. MARSCHKE:   Well, there's a lot  
15                  more guys doing the 5,000.

16                  DR. NETON:     -- workforce assigned  
17                  to it.

18                  MEMBER CLAWSON:   That's how they  
19                  get --

20                               (Simultaneous speaking.)

21                  DR. MAKHIJANI:   So it seems to me

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1 that that's a pretty important question. 72

2 DR. NETON: I agree.

3 DR. MAKHIJANI: And that's the  
4 biggest question. Those are the two big  
5 questions that are in my mind.

6 DR. NETON: I think what -- is the  
7 thorium exposure can be controlled and very  
8 low. Somehow, I think, within this analysis,  
9 there is a bounding mechanism. I do agree  
10 with you, Arjun.

11 It's sort of -- I'm not  
12 comfortable with double assignment of dose  
13 because it's just illogical. It's hard to say  
14 if you give people a 100 percent of each.

15 DR. TAULBEE: But, as Mark pointed  
16 out, then if you don't, then what about the  
17 residual source?

18 DR. NETON: Well, I think we need  
19 to talk about this. But I think what Tim's  
20 done here is a very nice analysis that clearly  
21 demonstrates what happened and what the

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1 exposure conditions were. 73

2 CHAIRMAN GRIFFON: I mean, I think  
3 the other thing that I'm curious about is the  
4 -- and I'm sure you have, from health and  
5 safety reports and interviews, I think, is  
6 your basis for this claim, that the air  
7 sampling data, where it's actually BZA, even  
8 though it says --

9 DR. TAULBEE: Pseudo-BZA.

10 CHAIRMAN GRIFFON: Pseudo-BZA,  
11 right, right, right. I think that might be  
12 worth looking at. It might even be important  
13 in the thoron aspect of it, all right. I  
14 assume they're also assumed to be BZA? It's  
15 the same sample.

16 DR. TAULBEE: Right, yes. It's  
17 the same sample almost. If you look at the  
18 air sample logsheets you'll see they'll have  
19 the time on, the sample on, sample off and  
20 then the time of the first counts and the time  
21 of the second count. All of that's there on a

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1 single air sample logsheet. 74

2 CHAIRMAN GRIFFON: Yes. But  
3 anyway, I think -- yes. So this will go  
4 through SC&A review and possibly more  
5 discussion.

6 DR. TAULBEE: Or a discussion  
7 paper on this or something like that.

8 Findings 1 and 2

9 CHAIRMAN GRIFFON: Yes, yes.  
10 Right, right, right. And I'll add this. I  
11 think this really belongs on that issue 1.

12 DR. TAULBEE: Oh, it is issue 1.

13 CHAIRMAN GRIFFON: This is totally  
14 issue 1, and there's no other changes in the  
15 addendum that we -- it's all on the thorium,  
16 right?

17 DR. TAULBEE: That is correct.

18 CHAIRMAN GRIFFON: Okay. All  
19 right. So with that, why don't we move on to  
20 the matrix, and at least go back to our  
21 initial matrix.

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1 DR. TAULBEE: Yes. 75

2 MEMBER CLAWSON: What?

3 DR. TAULBEE: Thorium nitrate.

4 MEMBER CLAWSON: Thorium nitrate.

5 DR. TAULBEE: Yes, and in fact,  
6 this kind of gets to the issue 2 that we have  
7 unearthed.

8 CHAIRMAN GRIFFON: Yes. Well, let  
9 me just read -- and this, I think, is going to  
10 change, now, a finding. We had finding 1 and  
11 2 kind of together, or issue 1 or 2, whatever  
12 we're calling them.

13 DR. MAKHIJANI: Well, Mark, I  
14 think issue 1 will now change from 3/19/60 to  
15 up to 1965.

16 CHAIRMAN GRIFFON: Five, right.

17 DR. MAKHIJANI: Right, Tim?

18 DR. TAULBEE: That's correct.

19 CHAIRMAN GRIFFON: And then issue  
20 2 will cover '65 and beyond, is that correct?

21 DR. TAULBEE: Through '71.

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1                   CHAIRMAN GRIFFON: Okay. But this<sup>76</sup>  
2 also says that NIOSH is completing its White  
3 Paper on thorium. It will use air  
4 concentration data only. I think that's all -  
5 -

6                   DR. TAULBEE: That's issue 2.

7                   CHAIRMAN GRIFFON: Okay. So this  
8 might be relevant for issue 2, okay, all  
9 right.

10                  DR. TAULBEE: Yes.

11                  CHAIRMAN GRIFFON: Okay. So why  
12 don't we just give an update -- maybe just  
13 give an update on issue 2.

14                  DR. TAULBEE: Okay. We can  
15 certainly do so. This is looking at the --  
16 it's currently labeled as post-1960 thorium,  
17 but it's really post-1965 thorium. This is  
18 where the thoria work was being conducted, and  
19 it really started in 1964 with their initial  
20 developments.

21                  And here's where we have a report

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1 coming out. It's going to be Report 46. It's  
2 currently being reviewed and we do expect it  
3 to be at least sent to DOE within the next  
4 week or so, and then obviously afterwards,  
5 we'll send it out here to the Board, and  
6 you'll probably want SC&A to look at that as  
7 well. But that's your choice, from that  
8 standpoint.

9 What we've done in report -- or  
10 what I mentioned earlier was that starting in  
11 1965, with the thoria powder, the process  
12 changed. So we can't use this uranium  
13 bioassay report. Instead of working with  
14 uranium metal, you're working with thorium  
15 powder.

16 So, powders are much more  
17 difficult to control in the workplace. So  
18 Savannah River built a glove box line to  
19 handle the thoria powder, and we have pictures  
20 of that in the report.

21 I believe it was attached to a

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1 HEPA filtration system before it went out the <sup>78</sup>  
2 building exhaust ventilation. There are  
3 pictures of it coming directly off the glove  
4 box line into the HEPA filter.

5 And so, all of this work of  
6 canning the thorium, they would take the  
7 thoria powder, they would compact it within  
8 the glove box. It would then look like a  
9 slug. There's some pictures of that.

10 They would then put it inside the  
11 can and then they would weld the can there all  
12 within inside the glove box line, take it out,  
13 and then they would do their other acceptance  
14 testing after it was already canned and  
15 welded.

16 And so, during this time period,  
17 we have thorium air sample data in that room  
18 with the glove box line. This individual who  
19 took those samples is the one that indicated  
20 that the position, the air sampler there, next  
21 to the glove box line where the people were,

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1 where the workers were working during this  
2 process.

3 And so, due to that, the secondary  
4 process, that's where we're proposing to use  
5 the air sample data in order to estimate doses  
6 during this time period. We do have  
7 indication that they used whole body counts as  
8 a confirmatory check.

9 If you would go through the  
10 monthly reports, they'll indicate that they  
11 sent, you know, ten people this month to the  
12 whole body counter for counting, to check for  
13 thorium assimilation.

14 In interviews -- and, Mel, please  
15 jump in, you're the one who talked to the  
16 individual -- this process was a very small  
17 operation. So in total, there was only 15 to  
18 20 people total that were working along this  
19 thoria powder line, where they were making  
20 these slugs.

21 So sending ten people or so per

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1 month into the whole body counter seems pretty  
2 reasonable. They never saw any thorium  
3 assimilations. That's mentioned in the  
4 monthly reports. But, based upon the  
5 detection levels and the MPCs that they were  
6 using, what we see in the air samples, you  
7 wouldn't expect to see any assimilations,  
8 because the air samples are actually below the  
9 MPC.

10 I think the geometric mean is .8  
11 or .08. So, it's only eight percent of the  
12 MPC is what we see from all the air sample  
13 data. So in other words the glove box line  
14 was doing what it was supposed to be doing,  
15 and controlling it fairly well.

16 Which takes us up to the end of  
17 the production time period, the 1969 time  
18 frame, and then the facility was D&D'd. And  
19 we have smear data during that D&D process.  
20 So by 1971, all of the thorium operations were  
21 pretty much gone from the facility.

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1 CHAIRMAN GRIFFON: So this covers  
2 '65 to '71, right?

3 DR. TAULBEE: That's correct.

4 CHAIRMAN GRIFFON: Okay, and this  
5 is going to be -- you're still going to  
6 provide a White Paper on this?

7 DR. TAULBEE: Yes.

8 CHAIRMAN GRIFFON: Not an  
9 addendum. It will be just a White Paper.

10 DR. TAULBEE: Yes, a report  
11 actually, and the reason why it's not part of  
12 the addendum was back during the time when we  
13 proposed or gave the original SEC Evaluation  
14 Report, we thought we'd be able to use whole  
15 body count data during that time period.

16 So we felt we could reconstruct  
17 the doses. We knew they had conducted whole  
18 body counts. We didn't have the data at the  
19 time, but we felt that we could use that to do  
20 it. As it turns out, finding that whole body  
21 count data has proved very, very difficult.

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1                   At Savannah River, all of the <sup>82</sup>  
2 whole body count data are in the individual  
3 files. So the only way to find those ten or  
4 so people would be to go through all 50-60  
5 thousand records, individual records at  
6 Savannah River, searching all of the whole  
7 body counts, to try and find those.

8                   So we didn't consider that to be  
9 feasible and we had this, all of this air  
10 sample data. So that's what we propose to  
11 use. So that's where we're at with this. I  
12 do expect to send out that report next week to  
13 DOE for the final ABC review, and then once  
14 that comes back, we'll post it there to the --

15                   CHAIRMAN GRIFFON: Did you find  
16 any accidents, incidents on the glove box  
17 line, any reports of things like that,  
18 abnormal --

19                   DR. TAULBEE: There were a few --

20                   CHAIRMAN GRIFFON: Because you're  
21 saying the glove box line was doing what it

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1 supposed to do. But I would expect over that<sup>83</sup>  
2 time period --

3 DR. TAULBEE: There were a few  
4 occasions where they would find some  
5 contamination, and they would go back in. You  
6 can see that in the survey log sheets. But  
7 they're very sporadic and really, having  
8 looked at most of the --

9 CHAIRMAN GRIFFON: And nothing  
10 enough to be picked up on the whole body  
11 counter, obviously?

12 DR. TAULBEE: No.

13 CHAIRMAN GRIFFON: Yes, right.

14 DR. TAULBEE: I can only think of  
15 one, maybe two that were noteworthy.  
16 Noteworthy in that, you know, it was the  
17 Health Physics technician saying you know, we  
18 need to wipe down this area. So that's -- and  
19 that was over that entire six-year time  
20 period. I believe one of them was during D&D,  
21 but I'm not sure it was.

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1                   CHAIRMAN GRIFFON:   Okay.  I don't  
2 think we have to go into this.  I just put on  
3 "remains an NIOSH action item," and did you  
4 have an update on the possible time frame of  
5 when we get this report?  It's in review now  
6 with DOE -- or no?

7                   DR. TAULBEE:   No.  It's in review  
8 with us.  I expect it to be approved later  
9 this week, early next week, and then, at that  
10 point, we'll send it to DOE and they have two  
11 weeks to review it.

12                   CHAIRMAN GRIFFON:   So it should be  
13 available by June time frame or something --

14                   DR. TAULBEE:   Yes.  Easily before  
15 June.  Probably at the end of your next Board  
16 meeting or shortly afterwards.

17                   DR. MAKHIJANI:   Mark, did you want  
18 us to combine these two thorium reviews into  
19 one White Paper?

20                   CHAIRMAN GRIFFON:   I guess it  
21 doesn't -- I would say keep them separate, but

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1 yes. 85

2 DR. MAKHIJANI: Keep them  
3 separate?

4 CHAIRMAN GRIFFON: Yes.

5 DR. TAULBEE: And because the  
6 processes are totally different.

7 CHAIRMAN GRIFFON: They're very  
8 different, yes, yes.

9 MEMBER CLAWSON: Okay. Where was  
10 this glove box line at?

11 DR. TAULBEE: 313 M.

12 MEMBER CLAWSON: So it kind of  
13 replaced the other process? I'm not that  
14 familiar with the building there. What I'm  
15 getting at is with the small personnel like  
16 that, they could be pulling people off other  
17 lines to submit this line. So when you start  
18 getting into vacation and whatever else like  
19 that, we see it quite often when they have  
20 small, when they say we've got a small group.  
21 They're usually pulled from another uranium

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1 line or whatever else like that. I'm just -86

2 DR. TAULBEE: It was all confined  
3 to one room. So yes, could they have pulled  
4 from others? I suppose probably they did,  
5 although I think it's also important to, and  
6 let me pull this back up here, the previous  
7 presentation again.

8 No, that was thorium metal. Never  
9 mind, I'm sorry. Yes. I'm not sure what --  
10 in the report, we have the production, don't  
11 we? So there's the production of a table, or  
12 not table but a graph.

13 MR. MAHATHY: You mean 46?

14 DR. TAULBEE: Yes, in 46. There's  
15 a graph that shows it.

16 MEMBER CLAWSON: Well, just keep  
17 in mind a lot of times like that --

18 CHAIRMAN GRIFFON: Can everybody  
19 just make sure we're speaking up? I know  
20 those on the phone are probably having trouble  
21 hearing.

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1                   MEMBER CLAWSON:     Okay.     I just<sup>87</sup>  
2                   want to make sure that we look at, you know,  
3                   I'm sure we've only got supposedly ten people  
4                   there.     We don't have all the data in there,  
5                   but usually, on a process like this, I'll end  
6                   up pulling people in from other places and  
7                   they go back and forth.

8                   We need to kind of be thinking  
9                   about how we would handle that, especially if  
10                  they said, oh yes, I was a part of this or  
11                  something like that.

12                  MR. MAHATHY:     We actually do build  
13                  that in the ER addendum.     The ER addendum was  
14                  the outcome proposals of all the people who  
15                  worked --

16                  CHAIRMAN GRIFFON:     Okay.     So this  
17                  is a remaining action item.     I don't know that  
18                  we have to do it now.

19                  DR. TAULBEE:     Okay.

20                  CHAIRMAN GRIFFON:     I'd rather save  
21                  the in-depth discussion for when we have the

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1 White Papers. 88

2 DR. TAULBEE: Okay.

3 Finding 3

4 CHAIRMAN GRIFFON: Moving on to  
5 Finding 3, I also think you don't have much of  
6 an update here, but just give us kind of a  
7 status and --

8 DR. TAULBEE: Sure.

9 CHAIRMAN GRIFFON: This is the  
10 recycled uranium?

11 DR. TAULBEE: Recycled uranium,  
12 yes. We are revising the TBD, and let me just  
13 say that some of these issues, you know, as  
14 Jim said, we have a draft report here that we  
15 have not released to you all, that I'm working  
16 off of. We need to review it a little bit  
17 more before we release it to you.

18 But this provides some of the data  
19 as to what we're proposing to -- how we're  
20 proposing to revise the TBD in order to  
21 address this issue. And so we've got some

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1 revised numbers here that we'll be putting in  
2 there, and I plan on putting out this report  
3 also, some time in the near future once we can  
4 get that reviewed, to you all, which would  
5 document our responses here.

6 I know you're updating your matrix  
7 as we speak here, but this would provide some  
8 written responses to some of the things that  
9 I'm saying here today.

10 CHAIRMAN GRIFFON: Okay.

11 DR. MAKHIJANI: So what's the form  
12 of those responses, Tim? Would that be a  
13 paper that you're still not getting the TBD,  
14 did you say?

15 DR. TAULBEE: Yes. But we will be  
16 providing that data that we'll be updating the  
17 TBD with, in what I would call a kind of  
18 response and status report to you all, so that  
19 you'll have something to review basically,  
20 instead of just saying we're going to do this  
21 in the TBD.

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1 Publication 68 does consider neutrons and  
2 fission fragments and prompt gammas, et  
3 cetera, from the spontaneous fission of  
4 californium-252.

5 So again, we'll put that into this  
6 interim issues report to you all documenting  
7 it. But we have, we've gone through and  
8 researched and found that it does in fact  
9 include that.

10 CHAIRMAN GRIFFON: Arjun, do you  
11 have a question?

12 DR. MAKHIJANI: Yes, as I had  
13 mentioned before, I discussed this with Joyce,  
14 I was unable to find an answer to this  
15 question, so I'm glad to you asked and tried  
16 to look at it.

17 CHAIRMAN GRIFFON: All right. I  
18 mean you might want to look at it, I think,  
19 and examine it too.

20 DR. MAKHIJANI: Because when I  
21 corresponded with Joyce about it, there was

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1 some question about how could it be done<sup>92</sup>  
2 whatever's being done. So I'd like to  
3 correspond with Joyce about this --

4 CHAIRMAN GRIFFON: Is there  
5 anything in writing beyond yes, it's in ICRP  
6 68?

7 DR. TAULBEE: Oh, yes. We have a  
8 paragraph discussing it.

9 CHAIRMAN GRIFFON: So these are  
10 the things that okay. You can provide those  
11 afterwards, and I'll integrate --

12 DR. TAULBEE: Well, that's going  
13 to be -- I was planning to put all this as  
14 part of our issues response within the next  
15 month.

16 CHAIRMAN GRIFFON: Okay. So that  
17 one's not complete?

18 DR. TAULBEE: No, it's complete.

19 CHAIRMAN GRIFFON: It's ready to  
20 go; you've just got to pull it all together.  
21 Okay, all right.

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1 DR. TAULBEE: Internally, before<sup>93</sup>  
2 we turn it over.

3 DR. MAKHIJANI: So there will be -  
4 - there is one issues response document?

5 DR. TAULBEE: Yes.

6 DR. MAKHIJANI: Okay.

7 DR. TAULBEE: One issues response  
8 document. I think that's more efficient than  
9 having 25 issues response document. And then  
10 the next, maybe the next Board meeting or the  
11 next Work Group meeting we can go through it  
12 and cross some of the issues off, and this  
13 one's been addressed.

14 CHAIRMAN GRIFFON: I mean, I would  
15 -- I think it might be worthwhile just letting  
16 Joyce know the nature of the response, and  
17 maybe she can at least begin to look into  
18 this.

19 DR. MAKHIJANI: Basically, on this  
20 point, the response is that it's in the ICRP  
21 68?

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1 CHAIRMAN GRIFFON: Right. 94

2 DR. TAULBEE: That's correct.

3 DR. MAKHIJANI: Okay. So I will  
4 talk to Joyce about that.

5 CHAIRMAN GRIFFON: Yes, okay. All  
6 right. I'm going to ask if we're going to  
7 take just a quick like ten minute, come back  
8 at 11:00 a.m., break, and continue on the  
9 matrix?

10 MR. KATZ: For everyone on the  
11 phone, we'll start back up at 11.

12 CHAIRMAN GRIFFON: Thanks.

13 (Whereupon, the above-entitled  
14 matter went off the record at 10:49 a.m., and  
15 resumed at 11:05 a.m.)

16 MR. KATZ: So we're reconvening  
17 after a short break. This is Savannah River  
18 Site Work Group, Advisory Board On Radiation  
19 Worker Health, and off we go.

20 Finding 5

21 CHAIRMAN GRIFFON: All right.

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1 We're continuing to go through the matrix. So  
2 we're on finding number 5, and I'm going to go  
3 through these, like I said, sequentially, even  
4 though they may not be very significant  
5 updates.

6 But we'll go through them  
7 sequentially, just for the sake of completion.

8 Finding 5, Tim, the status?

9 DR. TAULBEE: Sure. This is the  
10 neptunium coworker model, and this is all the  
11 coworker models. Well, not all of them, but  
12 just to give a brief update on all the  
13 coworker models, we're still working on them,  
14 and the actual due date, I think I had told  
15 you back in January, was going to be some time  
16 in June.

17 That has now been pushed out to  
18 August, as to when we would be receiving them,  
19 and I'll explain a little bit as to why that  
20 has happened.

21 One of the major things has to do

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1 with meeting the June 1st goal of processing  
2 dose reconstructions. So less people have  
3 been available to work on that in the past  
4 several months. The other issue actually  
5 comes up with neptunium-237 and with the mixed  
6 fission products.

7 The initial drafts of those  
8 coworker models, they found that there was not  
9 sufficient data in order to actually develop a  
10 coworker model. So what we've done or had to  
11 do is go back to the NOCTS data set and,  
12 instead of just looking at urinalysis data,  
13 we're now looking at the whole body count data  
14 as well.

15 So that is what is currently being  
16 included from neptunium-237, and from mixed  
17 fission products, and I'll get into that more  
18 on the next issue. So currently, there's more  
19 data being coded to supplement those uranium,  
20 or not uranium, the urinalysis, the neptunium  
21 urinalysis data, using the whole body count

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1 data. 97

2 And so the actual expected date  
3 for the coding to be finished is not until the  
4 end of June time frame, probably the middle of  
5 July is when that will actually be completed.

6 That's when the analysis will begin on that  
7 particular issue.

8 DR. MAKHIJANI: Full analysis?

9 DR. TAULBEE: Yes. The data  
10 coding is estimated to take about three  
11 months, and this was started the first of  
12 April. So all of April, May, June. I'm  
13 anticipating a couple of weeks of delay, just  
14 because it happens. So the analysis will  
15 start probably mid-June or mid-July, I'm  
16 sorry. Mid-July.

17 CHAIRMAN GRIFFON: I'm sorry.  
18 This response applies to neptunium, but you  
19 said also --

20 DR. TAULBEE: Mixed fission  
21 products fall into the same --

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1 CHAIRMAN GRIFFON: Which is issue 98  
2 6.

3 DR. TAULBEE: Issue 6 and 7.  
4 Findings 6 and 7

5 CHAIRMAN GRIFFON: And seven is  
6 the activation? Yes, 6 and 7?

7 DR. TAULBEE: That's correct, and  
8 but there is a little bit more of an update.  
9 We have a longer discussion on 6 and 7 last  
10 time, and you asked some additional questions.  
11 Those we are prepared to answer.

12 CHAIRMAN GRIFFON: Okay. I want  
13 to ask, not to bring the temperature up in  
14 this meeting, but when you did the initial ER  
15 report, refresh my memory. What did NIOSH,  
16 what is NIOSH's -- I haven't found it right  
17 now -- what was NIOSH's position on the  
18 neptunium coworker model?

19 DR. TAULBEE: We had -- we had  
20 indicated that we had sufficient urinalysis  
21 data. But what we were doing is looking at

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1 the total number of data points. We were not<sup>99</sup>  
2 looking at breaking it down by --

3 CHAIRMAN GRIFFON: But this is  
4 part and parcel to the entire regulatory  
5 process. I mean, we've always gone back to  
6 the reg and said well, NIOSH has to -- the  
7 timeliness issue. NIOSH has to, in the time  
8 frame set out in the regulations, determine  
9 that they have sufficient data available to do  
10 dose reconstruction.

11 We've pushed back with the  
12 Advisory Board process and said that we want  
13 to, you know, basically show me the money,  
14 you know, see the data, see how you're going  
15 to do it. And the delay has always been sort  
16 of put on the Advisory Board, because NIOSH  
17 met their time frame.

18 In this case, I would argue that  
19 NIOSH didn't meet their time frame. They said  
20 they could do a urinalysis coworker model  
21 because you had the data. Now you're coming

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1 back and saying oh, we looked a little harder,<sup>100</sup>  
2 and we realized we don't really have the data.

3 So is there a timeliness issue  
4 here? I mean I --

5 DR. TAULBEE: I would challenge  
6 your, that we don't have the data, because we  
7 do. It's all in-house and it's all been in-  
8 house.

9 CHAIRMAN GRIFFON: But you just  
10 said the data was -- we found part of the  
11 delay was based on the fact that there was not  
12 sufficient urinalysis data. You said it was -  
13 - the thorium model was going to be based on  
14 urinalysis data.

15 DR. TAULBEE: Yes, that had  
16 already been coded, okay. Now all we are  
17 doing is going through the individual claim  
18 files that we have, and we're coding the whole  
19 body count data. So we've had this data --

20 CHAIRMAN GRIFFON: But that's not  
21 urinalysis data.

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1 DR. TAULBEE: No, it's not.  
2 That's all. I'm not trying to make this  
3 overly contentious, but I know from our side,  
4 where we sit, the public is constantly on us  
5 about the timeliness question, and rightly so.

6 I mean, you know, and a lot of the  
7 delays are our process. I understand that.  
8 But I, you know, I'm just pointing that out to  
9 -- I mean, I think you might have to answer at  
10 a full Board meeting, if this kind of thing  
11 comes up. I think we, you know, we should,  
12 you know, okay.

13 DR. MAKHIJANI: I'm a little  
14 confused about this, because you know, this  
15 may come up when we discuss our review of TIB-  
16 0075 and construction worker or non-  
17 construction worker. But, if memory serves me  
18 right, in the Evaluation Report you said you  
19 had coded all claimant data, and then -- I  
20 think it does say that in the Evaluation  
21 Report.

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1                   And then so we proceeded on that <sup>102</sup>  
2 basis to do our review, and then actually we  
3 didn't check whether it was all claimant data  
4 or not. We just assumed it was.

5                   CHAIRMAN GRIFFON:       I didn't  
6 remember the coded part, but I thought I  
7 remembered that it was a urinalysis-based  
8 coworker model assignment. All right. I  
9 don't want to harp on that. I just thought  
10 that it was worth pointing out, and it is an  
11 issue often brought before us at the full  
12 Board meetings.

13                  DR. TAULBEE:       And I understand  
14 that point. So it's just -- you know, let me  
15 just clarify. The only thing that I was  
16 concerned with what you had said was that it  
17 made it sound like we had gone and gotten more  
18 data, and we hadn't. We were just mining our  
19 files a little better and --

20                  CHAIRMAN GRIFFON:   Okay. Anyway,  
21 so we have the estimated time frames anyway on

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1 the completion of this, June and then August  
2 for the -- probably back to us, August is a  
3 likely time frame?

4 DR. TAULBEE: Most likely, yes.

5 CHAIRMAN GRIFFON: All right, and  
6 so, Arjun, unless you, and I don't think  
7 there's much to comment on at this point.  
8 Let's move on to 6 and 7. Similar responses,  
9 but there's a little more story to tell. Is  
10 that what you're saying?

11 DR. TAULBEE: That's correct.  
12 It's the same issue. Well, with mixed fission  
13 products, it's really the inverse of what we  
14 see traditionally, and that is all urinalysis  
15 data prior to 1965 can be used for a coworker  
16 model. The data after 1965 can't be.

17 What happened was they changed  
18 their reporting detection limit, because they  
19 started relying on the whole body counter more  
20 for confirmation that assimilations were not  
21 happening, because it was more sensitive than

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1 the urinalysis. So -- actually, it wasn't<sup>104</sup>  
2 more sensitive than the urinalysis; I  
3 shouldn't say that. It was more convenient,  
4 easier to do.

5 So starting in 1965, they raised  
6 what their threshold was for actually  
7 reporting the mixed fission products. So we  
8 went through and started developing the  
9 coworker model. We can go all the way up to  
10 1965, at which point now the doses jump up  
11 tremendously high, due to this artificial  
12 reporting limit that they had for urinalysis.

13 So this is where we actually  
14 started to go back to the whole body count  
15 data, because we could drop the sensitivity  
16 back down to around the order of where the  
17 previous, pre-1965 data was. While we were  
18 there, we said, let's get the neptunium data  
19 at the same time.

20 So they're actually interrelated,  
21 5 and 6, from a coding standpoint, even though

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1 the coworker model is totally different. So 105  
2 this is a case where we started to develop the  
3 coworker models. We set off the urinalysis.  
4 We ran into this higher detection limit, and  
5 so now we're looking at the whole body count  
6 data to bring it down to something that's more  
7 reasonable.

8 So that's the status of where  
9 we're at with that one, although during the  
10 discussion that we had, I believe it was Arjun  
11 or maybe it was you, Mark, indicated how will  
12 we know the mixed fission product, the mix,  
13 that we use in the TBD is claimant-favorable.

14 And we didn't know that. So part  
15 of what we've done over the past four months  
16 is we went back and compared the ratios of  
17 mixed fission products that are in the  
18 Savannah River Site TBD, to what is in OTIB-  
19 0054, which is a very rigorous analysis of  
20 fuel decay times and different steps of the  
21 process.

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1                   And we found that the ratios that<sup>106</sup>  
2                   are in the Technical Basis Document, Site  
3                   Profile currently, are more claimant-favorable  
4                   than what's in OTIB-0054.

5                   However, we kind of ran into a  
6                   dilemma here of OTIB-0054 we considered to be  
7                   more rigorous, more scientifically based and  
8                   bounded. Savannah River Site TBD was the  
9                   first TBD ever written that we tried, so we  
10                  built in a lot of conservative assumptions.

11                  So we feel OTIB-0054 is a better  
12                  representation of what that mix should be. So  
13                  we plan on updating Savannah River Site TBD to  
14                  be consistent with OTIB-0054. Does that make  
15                  sense to everybody?

16                  CHAIRMAN GRIFFON: Yes. I'm just  
17                  trying to keep my notes up to date.

18                  DR. TAULBEE: Sure, sure, sure.

19                  CHAIRMAN GRIFFON: Arjun, do you  
20                  have any follow-up on that?

21                  DR. MAKHIJANI: I don't think I

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1 followed your, 1965 transition thing, but <sup>107</sup>we  
2 can just wait until we see the piece of paper  
3 first. We're not going to do anything.

4 CHAIRMAN GRIFFON: So you're going  
5 to -- out of this we're expecting really two  
6 things, the coworker models, but also in your  
7 report with all your responses, you'll have a  
8 section on this, discussing the choice of --  
9 or that it's a claimant-favorable approach,  
10 right?

11 DR. TAULBEE: That's correct.  
12 That discussion of the mix will be in this  
13 issues report that we have. And then in the  
14 coworker model, we'll go through the  
15 discussion that I think Arjun was asking for,  
16 of why the transition from urinalysis data to  
17 the whole body count data, due to the higher  
18 detection limit.

19 DR. MAKHIJANI: No, I understood  
20 why they made the transition, but I don't  
21 think I got how you're making the adjustments,

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1 because the MDA is so high. But we'll just  
2 look at the paperwork and then try to figure  
3 it out, rather than hash it out verbally.  
4 Sometimes we just need to look at the paper.

5 DR. TAULBEE: Okay.

6 DR. MAKHIJANI: I'm okay with it,  
7 yes.

8 DR. TAULBEE: So that's really  
9 where we're at then with the issue 6 and 7. I  
10 just wanted to give you that update, that  
11 there is more data coding going on and we did  
12 look at your question as far as the fission  
13 product mix.

14 And there is a White Paper coming  
15 out about that comparison of the fission  
16 product mix.

17 DR. MAKHIJANI: Oh, okay.

18 CHAIRMAN GRIFFON: So that's in  
19 addition to the issues report?

20 DR. MAKHIJANI: Is that separately  
21 from this?

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1 DR. TAULBEE: If you want <sup>it</sup>~~it~~  
2 separate, we can do that or we could run it  
3 with other issues. It's up to you all.

4 CHAIRMAN GRIFFON: However you  
5 want to provide it, you know. If it makes  
6 sense to roll it in, that's fine. If you  
7 think it's something that's going to overlap  
8 on other sites or whatever, it may be good to  
9 separate it --

10 DR. TAULBEE: No. Savannah River-  
11 specific.

12 CHAIRMAN GRIFFON: Savannah River-  
13 specific?

14 DR. TAULBEE: We'll include this  
15 as an appendix to this issues report then.  
16 That would be done --

17 Finding 8

18 CHAIRMAN GRIFFON: Okay. If  
19 there's no further comments, issue 8. We can  
20 move on to finding or issue 8, whatever works  
21 for you.

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1 DR. TAULBEE: This is one where <sup>110</sup>  
2 we're still working, as far as the --

3 CHAIRMAN GRIFFON: Which one is  
4 this? It's the coworker model --

5 DR. TAULBEE: Of polonium 210.

6 CHAIRMAN GRIFFON: Polonium 210.

7 DR. TAULBEE: Yes, and this is a  
8 very small operation. It was done in the 700  
9 area, and so the bioassay is going to be very  
10 limited. However, also, so is the exposure  
11 time period and the number of people.

12 Most of the polonium 210 that was  
13 made at the site was shipped directly to  
14 Mound.

15 CHAIRMAN GRIFFON: Mound.

16 DR. TAULBEE: And so this was  
17 some, one or two small projects that we do  
18 have documentation that they did some -- they  
19 have a single glove box set up in one room in  
20 the 700 building, where they worked the  
21 polonium.

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1                   CHAIRMAN GRIFFON:     How are you  
2 going to determine who worked on this process?

3       That's always been a question on these kind  
4 of things, you know.

5                   DR. TAULBEE:     Well, from it being  
6 a coworker standpoint, that's the whole reason  
7 we're developing this.     I guess I'm not  
8 convinced that everybody who worked on it was  
9 actually -- actually has bioassays.     So we're  
10 not sure.

11                  CHAIRMAN GRIFFON:     But then if  
12 everybody doesn't have bioassay and you  
13 started playing the polonium doses across the  
14 site, I think you get into some rough places.

15                  DR. TAULBEE:     Yes.     We certainly  
16 should not be applying these across the whole  
17 site.

18                  CHAIRMAN GRIFFON:     Right.     So how  
19 do you know --

20                  DR. TAULBEE:     The way I -- unless  
21 the largest bound I would see would be the 700

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1 area, because we can identify them, those<sup>112</sup>  
2 people based upon TLD badge, of being in the  
3 area. This operation was early 1967. So it's  
4 one year.

5 CHAIRMAN GRIFFON: Sixty -- fifty  
6 --

7 DR. TAULBEE: '67.

8 CHAIRMAN GRIFFON: '67.

9 DR. TAULBEE: Yes. So it's  
10 really, really small.

11 Finding 9

12 CHAIRMAN GRIFFON: Okay, and then  
13 Finding 9, just to go through these  
14 sequentially.

15 DR. TAULBEE: Finding 9 is where  
16 we'd like to discuss a little more of the  
17 OTIB-0075 type of issues, because that's where  
18 this has kind of come up for us.

19 CHAIRMAN GRIFFON: Okay.

20 DR. TAULBEE: Okay. And so what  
21 we've done is the tritium coworker model we

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1 went through and developed, and once it was  
2 developed, we went through and separated out  
3 construction trades workers versus non-  
4 construction trades workers and compared them,  
5 especially against the OTIB-0070 or SC&A's  
6 review of OTIB-0075.

7 And so what we did was, we took  
8 the tritium urinalysis, the bioassay data from  
9 '54 to 1990 and converted it to annual doses  
10 for each of the claimants. We stratified it,  
11 based upon construction trades and non-  
12 construction trades. We did not include  
13 zeroes in our data set.

14 And from that point, and again we  
15 were using the one sample or the highest --  
16 well, actually these weren't the highest  
17 sample. They were total dose for the year for  
18 each person.

19 What we found is that of the 37  
20 years we compared, 20 of them we don't see any  
21 difference between construction trades workers

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1 and non-construction trades workers, 20 of the <sup>114</sup>  
2 37.

3 For the 17 where there is a  
4 statistical difference between the two, the  
5 construction trades workers were always lower.

6 So this is kind of the opposite of what SC&A  
7 has found in their OTIB-0075, yes, for  
8 tritium. And that's why I wanted to bring  
9 this up here and try and open some dialogue  
10 here.

11 We've had a couple of  
12 statisticians look at this already, and we've  
13 got a third one, Daniel, who's currently  
14 working on this for us.

15 But it's causing us some concern  
16 in that SC&A has an analysis that's showing  
17 construction trades workers are more heavily  
18 exposed for tritium, and we're showing the  
19 opposite.

20 DR. MAKHIJANI: Did you parse it  
21 by area or job type?

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1 DR. TAULBEE: No. 115

2 DR. MAKHIJANI: That's what -- I  
3 mean our whole analysis in the OTIB-0075  
4 review was that you have to parse it by job  
5 type and area, otherwise you won't catch the  
6 differences. So I think --

7 DR. TAULBEE: But if you're  
8 looking --

9 DR. MAKHIJANI: -- to compare --  
10 at this stage, just going on what you have  
11 said, to respond to what -- you're doing  
12 apples and oranges because our whole approach  
13 to review of OTIB-0075 was to see why it would  
14 apply in here, which is what you've done, and  
15 then to see whether there were certain job  
16 types and in certain areas construction  
17 workers were more exposed. Where's our  
18 tritium? I think it's the last section.

19 DR. TAULBEE: Well, I guess here's  
20 one of the concerns our statisticians have all  
21 voiced of that stratification of, you know,

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1 what is the basis of the stratification in  
116  
2 kind of the first place?

3 You know, and I noticed in your  
4 stratification you've got all the reactors  
5 individually separated. All the reactors were  
6 heavy water reactors; they were all operated  
7 similarly. Why should those be broken out  
8 separately versus all combined?

9 So there's concern about too much  
10 stratification is where they're -- at least  
11 our statistician's concern is, that could be  
12 causing some of this difference. You know, in  
13 my mind, from thinking of the Savannah River  
14 Site, stratifying, really the only  
15 stratification that makes sense to me, based  
16 upon location, is the canyon area, the 200  
17 areas, versus the reactors.

18 Those processes are different, and  
19 so that would be really the only location  
20 stratification I would even look at, at least  
21 in my mind, and then if you look at

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1 construction trades workers altogether versus  
2 non-construction trades workers.

3 So I guess I wanted to know, why  
4 did you stratify across all the actors?

5 DR. MAKHIJANI: Well, I think it  
6 would be better to see something in writing,  
7 because -- I don't know. Harry, are you on  
8 the phone, on the line?

9 MR. CHMELYNSKI: Yes, I am.

10 DR. MAKHIJANI: You know, I think  
11 you can argue that you can put all the  
12 reactors together or not, but I think a  
13 stratification, we found, was necessary, and  
14 Steve and Harry -- Steve compiled the data  
15 and did the initial compilation, and Harry  
16 did the statistical analysis. So I'll let  
17 them give you a preliminary response.

18 But, overall, I really prefer to  
19 see your statistical analysis in writing,  
20 because these are pretty complex topics. My  
21 gut response is, if you haven't batched it

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1 even, you could lump all the reactors together<sup>118</sup>  
2 and the reprocessing areas together. But if  
3 there's no parsing by area, you can't really  
4 compare the two analyses. I mean that's my  
5 initial response. Harry?

6 MR. CHMELYNSKI: Yes. I think our  
7 conclusion agreed with their conclusion, in  
8 terms of the all-worker, all-area analysis  
9 that yes, we agree that it's been demonstrated  
10 they are comparable, and the question then  
11 becomes, is that the appropriate level of  
12 detail to work at.

13 In terms of the specific breakdown  
14 we used, I have to refer that to Steve, as to  
15 why he picked the areas he did in our tables.

16 MR. MARSCHKE: That's pretty  
17 simple. I mean we just picked those areas,  
18 because those areas were ones where we had  
19 data for in the data files that we used, and  
20 that's another question I guess we wanted to  
21 talk somewhat with NIOSH about.

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1                   When we started this analysis<sup>119</sup>  
2 probably over a year ago, the first thing we  
3 did was we went to the O: drive and when the  
4 O: drive was still on the -- was still the  
5 ORAU O: drive, and we found a couple of data  
6 files that were available that looked to be  
7 the appropriate data files.

8                   And we downloaded those data files  
9 and that forms the basis of all the subsequent  
10 analysis. Recently, discussions that we've  
11 had, including the Work Group meeting back in  
12 January, has led me to believe that NIOSH has  
13 a much more extensive NOCTS database than what  
14 it is we used in our analysis.

15                   CHAIRMAN GRIFFON:       So I guess  
16 that's a preliminary thing. We want to make  
17 sure we're working with the same data, yes.

18                   MR.    MARSCHKE:       Yes.       That  
19 definitely could cause a difference in the  
20 results. Now when we were getting ready to  
21 release this, one of the things I did was I

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1 went back to the O: drive, to the folder where  
2 I got the files, and checked to make sure, to  
3 see whether or not they had been updated, and  
4 they had not been updated, so we did not make  
5 any changes.

6 But again, discussions that have  
7 been going on recently, leads me to believe  
8 that there is more NOCTS data out there than  
9 what we have included in our analysis.

10 DR. TAULBEE: I'm not sure that  
11 there is, but we will certainly check that. I  
12 have one question I wanted to ask you all is I  
13 know, Arjun, you posted a couple of -- or  
14 several spreadsheets just last week. Are  
15 those the analysis files that you're talking  
16 about Steve?

17 MR. MARSCHKE: Yes.

18 DR. TAULBEE: Okay. The  
19 statisticians will work from those.

20 CHAIRMAN GRIFFON: And I was just  
21 going to ask. Maybe we can ask NIOSH to do

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1 the same, if you can provide your analysis  
2 files on the O: drive.

3 DR. TAULBEE: Certainly.

4 CHAIRMAN GRIFFON: And then --

5 DR. TAULBEE: Hopefully we're  
6 working from the same sets.

7 CHAIRMAN GRIFFON: Right.

8 Hopefully we're working from the same set --

9 DR. MAKHIJANI: I don't know if we  
10 are. We, and that, I think, is a problem,  
11 because we assumed, based on the Evaluation  
12 Report, that all NOCTS data had been coded,  
13 because that's what the Evaluation Report  
14 said. I just checked.

15 And so we proceeded from the  
16 spreadsheets that were there on that  
17 assumption. But it turns out not all NOCTS  
18 data has been coded, or maybe there are new  
19 claimants since it was coded. I mean, I don't  
20 know what has happened. But now we're not --  
21 it seems clear that we're not working from the

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1 same data. 122

2 DR. TAULBEE: Okay. Well I think  
3 the start point then will be, we'll work from  
4 the same data, at least from that standpoint,  
5 and see if we can then compare apples and  
6 apples.

7 CHAIRMAN GRIFFON: Well, I guess  
8 what I would propose is put up the data set  
9 that you're working from, along with your  
10 analysis files, to post the data set that  
11 you're working from along with your analysis  
12 files on the O: drive.

13 And then also in your issues  
14 response report, I guess we'll get a  
15 description of what you did in your  
16 conclusions, right, on this --

17 DR. TAULBEE: Actually, not in the  
18 issues -- well, we can put it in there, sure.

19 We were actually planning a separate response  
20 to SC&A's OTIB-0075 review.

21 CHAIRMAN GRIFFON: That's fine.

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1 This can be a stand-alone, because TIB-0075<sup>123</sup> is  
2 a big -- covers several things. So yes, all  
3 right. So in your TIB-0075 response, you can  
4 outline it.

5 Then once SC&A has their response  
6 and the data from the O: drive, it may be, at  
7 some point we may want to break off and have a  
8 technical call, where we can get the  
9 statisticians to work, you know, talk through  
10 this a little more.

11 Because maybe it is a matter of  
12 just the data, but maybe it's a matter also of  
13 the selection of how you slice the data. So,  
14 and there may be some dialogue that has to  
15 happen there.

16 DR. MAKHIJANI: Yes. I think my  
17 gut feeling is that it would really be good to  
18 have an apples-to-apples comparison, and we  
19 won't have it unless you make some parsing of  
20 the data that you consider reasonable. If  
21 you're going to --

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1 I mean, I definitely see <sup>an</sup> ~~124~~  
2 argument for putting all reactor data together  
3 and all canning data together, and that's a  
4 sort of an argument within, you know, you can  
5 have some technical differences about that.

6 But I think we won't have  
7 comparable analyses unless we're operating  
8 from the same data, and unless you have some  
9 analysis by area of construction workers and  
10 non-construction workers.

11 DR. TAULBEE: Can I propose, you  
12 know, that this time, that first we start from  
13 the same data set. So we'll try and get that  
14 hashed out in the next few weeks here. Then  
15 if you all would do an analysis of basically  
16 the reactors together and the canyons  
17 together, we'll do the same.

18 Then just the first cut of all  
19 construction trades workers versus non-  
20 construction trades workers, and then we can  
21 talk about the additional, you know,

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1 stratification of additional trades if you  
2 want.

3 But at least so we can try and  
4 walk through this together on the same page is  
5 what I'm trying to get to. Would that be  
6 acceptable as a starting point to resolve this  
7 issue?

8 DR. MAKHIJANI: I think so.  
9 Tentatively, let me just say yes. I mean, the  
10 only reason I'm hesitating is as we go along,  
11 we'll be kind of doing reviews in parallel,  
12 and we'll be redoing our TIB-0070 type review  
13 as you are doing a response to our OTIB-0075.

14 I think it seems a little kind of  
15 labor-intensive to be doing reviews of reviews  
16 in parallel with Ted, Mark. I mean, I'm happy  
17 to follow your direction.

18 DR. TAULBEE: I agree, that it  
19 does seem like it would be, but I'm not sure  
20 we're going to come to an agreement, unless we  
21 start trying to walk through it together.

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1                   CHAIRMAN GRIFFON:   And I hate <sup>to</sup><sub>126</sub>  
2   rush the judgment on the stratification,  
3   because that seems to be one of the more  
4   important, you know, criteria in this  
5   analysis. I mean, I think if you look at the  
6   overall data set the same way, you're going to  
7   get the same result probably, hopefully.

8                   But the stratification becomes  
9   important, and maybe they're -- I don't know  
10   enough about the Savannah River, especially  
11   the construction worker sector, whether  
12   there's subsectors, pipefitters or others that  
13   fall into that category, that are different  
14   enough than the overall, that there are  
15   reasons for separating them --

16                  DR. MAKHIJANI:   I think there are.  
17   Steve, did we do a tritium analysis by job  
18   type?

19                  MR. MARSCHKE:   We did a -- yes.  
20   There is a limit as to how much you can parse  
21   the data, because you can either go by area or

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1 you can go by job type. But we wouldn't  
2 recommend you go by area and job type, because  
3 you just -- then you end up with very little  
4 data.

5 CHAIRMAN GRIFFON: Lose your  
6 numbers.

7 MR. MARSCHKE: But we did do, we  
8 did do, found we did have enough tritium data  
9 so that we could look at the -- all the job  
10 types, construction job types, and I think  
11 that is reflected in our report.

12 There are some graphs and figures  
13 in there which do demonstrate kind of  
14 consistently what we found, I think, in the  
15 OTIB-0052 report. We found some construction  
16 occupations received higher doses than other  
17 occupations.

18 DR. MAKHIJANI: And that three --  
19 actually, we compared non-construction workers  
20 and non-construction workers, construction  
21 workers to construction, you know, and then

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1 construction workers to non-construction  
128  
2 workers. There are a number of different  
3 types of comparisons in that report.

4 DR. TAULBEE: That's where I'd  
5 like to try and jump back to kind of some of  
6 the basics, and see if we can get on the same  
7 page, before we start breaking it out into all  
8 of the different construction trades and so  
9 forth, to see if, you know, the analysis will  
10 agree.

11 CHAIRMAN GRIFFON: Well, I would  
12 ask that SC&A consider, you know, the  
13 stratification that you just talked about.  
14 But I don't want to do, you know, I don't  
15 think that SC&A is ready to say yes, we think  
16 that's the right strata, you know.

17 But at least consider those strata  
18 that Tim just mentioned, and then you know,  
19 like you said, make sure the data is the same  
20 that we're working from. So in the next  
21 couple of weeks, hopefully that's the stuff

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1 that's going to be resolved. 129

2 MR. KATZ: So maybe they should  
3 just have a technical call, because it's hard  
4 for them to do it on the fly here. But maybe  
5 they should have a technical call, so that at  
6 least Tim and his folks can hear their input  
7 on --

8 CHAIRMAN GRIFFON: And their  
9 reasoning for --

10 MR. KATZ: -- observations and  
11 reasoning --

12 CHAIRMAN GRIFFON: Yes, I agree.

13 MR. KATZ: -- and then they can  
14 take that into account. They can do their  
15 work. SC&A doesn't have to do more work on  
16 this at this point.

17 CHAIRMAN GRIFFON: But I'm not  
18 sure any of that can happen until at least we  
19 get the same, make sure the data's the same.

20 MR. KATZ: Yes. I mean that's  
21 separate, getting the data -- being on the

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1 same page with respect to data is another. 130

2 CHAIRMAN GRIFFON: Right.

3 MR. KATZ: But I think the  
4 technical call would at least then Tim Taulbee  
5 and his crew aren't going forward with an  
6 approach that is sort of a non-starter.

7 CHAIRMAN GRIFFON: Yes, yes. I  
8 agree, and we'll schedule that once we -- once  
9 the data is posted and stuff like that. Just  
10 let me know, and it will be an SC&A and NIOSH  
11 technical call, but all members of the Work  
12 Group will be notified if they want to listen  
13 in.

14 So hopefully within the next,  
15 maybe, month that can happen, after the data's  
16 posted and maybe a week or two after that, you  
17 know, something like that.

18 MR. MARSCHKE: I was just going to  
19 say if you look at the email that Arjun sent,  
20 directing you to where the data files are,  
21 again those data files have been extensively

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1 changed. They include my analysis in there<sup>131</sup>

2 If you want to track back and look  
3 at the data files, the original data files  
4 that I started with, those are in the coworker  
5 directory, under the working files, under the  
6 SRS, under the coworker study, and then  
7 there's finally a folder called "Original Data  
8 Files."

9 DR. TAULBEE: Can you send me an  
10 email with that directory?

11 (Simultaneous speaking.)

12 CHAIRMAN GRIFFON: Didn't y'all  
13 get that?

14 DR. TAULBEE: Can you just post  
15 that --

16 MR. MARSCHKE: I'll send an email  
17 or something to --

18 DR. TAULBEE: Can you just put the  
19 whole data -- can you just pull it over into  
20 the AB directory?

21 MR. MARSCHKE: I can pull a copy

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1 of the original data file folder over and put  
2 it into the directory where Arjun has put the  
3 --

4 CHAIRMAN GRIFFON: I think that  
5 would be easier, yes.

6 MR. MARSCHKE: Yes, okay. We can  
7 do that.

8 DR. MAKHIJANI: And you simply  
9 called them original NIOSH files.

10 MR. MARSCHKE: I'll just put the  
11 whole folder, yes.

12 DR. MAKHIJANI: Yes, put the whole  
13 folder in.

14 MR. MARSCHKE: Just take the whole  
15 folder, it's got the name on it, "Original  
16 Data Files" and you just plop it in there.

17 CHAIRMAN GRIFFON: That will be  
18 fine. Okay.

19 DR. MAKHIJANI: All right. The  
20 other thing I'd just like to say is that, you  
21 know, in figure 5-3 in the table above that,

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1 we've got the comparison of tritium samples<sup>133</sup>  
2 for construction workers by craft, with  
3 samples for all non-construction workers.

4 That's sort of a relevant parsing.

5 I don't know, you know, whether we want to  
6 combine these crafts.

7 But we thought these were the  
8 things that I think we had analyzed when we  
9 looked at TIB-0052, and I believe the NIOSH  
10 data from TIB-0052 external dose had those  
11 various categories. Am I remembering right  
12 Steve? You did that.

13 MR. MARSCHKE: We looked at TIB-  
14 0052. We looked at some of these crafts.  
15 Again, you know, we didn't start with a list  
16 of crafts and then go into the database. What  
17 we did is we looked at the database and saw  
18 what crafts were available to us.

19 DR. MAKHIJANI: Okay. But these  
20 are broadly, I think, the same. There's a big  
21 overlap with what we did in TIB-0052 for

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1 external dose, and the results were not that  
134  
2 different, or somewhat different actually.

3 MR. MARSCHKE: And if I recall  
4 what we did in 52, the final conclusion or the  
5 way we resolved a lot of this was to put a  
6 little note in OTIB-0020, saying that if your  
7 claimant is in one of these crafts, you may  
8 have to take special considerations.

9 DR. MAKHIJANI: Pipefitters come to  
10 mind.

11 MR. MARSCHKE: Pipefitters comes  
12 to mind, exactly. So maybe, you know, and I  
13 think that's the way we addressed this.

14 DR. MAKHIJANI: And that was for  
15 external dose.

16 MR. MARSCHKE: And that was for  
17 external, right.

18 DR. MAKHIJANI: Okay.

19 MR. MARSCHKE: The other thing  
20 about 52 -- again this is very related to 52,  
21 construction workers -- but the other thing

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1 about 52 was the internal on 52 was based on<sup>135</sup>  
2 uranium and plutonium data.

3 DR. CHEW: Just plutonium.

4 MR. MARSCHKE: Just plutonium.

5 DR. CHEW: Yes, sir.

6 MR. MARSCHKE: And since this is  
7 tritium, a lot of the SRS concern is with  
8 tritium, we may want to take some, you know --  
9 how applicable are the conclusions that were  
10 reached in 52 for plutonium, for, you know,  
11 the tritium isotope.

12 DR. MAKHIJANI: Of course, we've  
13 sent you a separate report, because last time  
14 Jim had raised this question about the TIB-  
15 0052 plutonium database, and we did look at  
16 that. And we've sent you the -- I think, have  
17 you seen it? I don't know if you're on that.

18 But Tim --

19 DR. NETON: I have not read it.

20 MR. MARSCHKE: Well, it came out a  
21 week ago.

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1 DR. NETON: Yes. Now I definitely <sup>138</sup>  
2 haven't read it.

3 MR. MARSCHKE: I think the main  
4 conclusion was -- the main sentence is we  
5 agree with the NIOSH regarding the ER  
6 statement concerning OTIB-0052 plutonium  
7 bioassays. But we're just unclear as to, you  
8 know, what it has to do with the validity of  
9 the coworker study, or the coworker model.

10 DR. MAKHIJANI: And also the  
11 plutonium bioassay doesn't allow us to get  
12 into this area question. There just wasn't  
13 enough data there to do anything.

14 DR. TAULBEE: I think a technical  
15 call is really in order here.

16 DR. MAKHIJANI: Yes.

17 DR. TAULBEE: Because we have  
18 other questions. So let's try and get the  
19 data set issue resolved, and then we'll  
20 schedule a technical call and then we'll go  
21 our different ways for the analysis.

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1 DR. MAKHIJANI: But it would be  
2 helpful to see something in writing from you  
3 on the statistical analysis, so Harry can look  
4 at it and we can all look at it and then we  
5 can talk about --

6 DR. TAULBEE: Do you want to do  
7 that before the technical call?

8 CHAIRMAN GRIFFON: Well, I think  
9 the data and the preliminary analysis. SC&A  
10 has their analysis up there, post what you  
11 have.

12 DR. NETON: But it sounds to me  
13 like we have issues of the database and that  
14 we didn't stratify. So really, I think SC&A's  
15 comment's going to be well, you're comparing  
16 apples and oranges.

17 CHAIRMAN GRIFFON: Yes. You  
18 probably don't need to see their analysis.

19 DR. NETON: I don't know that it  
20 really accomplishes much.

21 DR. MAKHIJANI: Well, if we put up

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1 the data, you know, I'm not -- you know, it's  
2 a different data set. It's a much bigger data  
3 set.

4 I don't know how -- some of these  
5 ratios are based on, you know, fairly small  
6 numbers. Some are more robust and have bigger  
7 numbers. I mean, we omitted when we had less  
8 than ten data points for construction workers,  
9 right, Steve?

10 MR. MARSCHKE: That's right.

11 DR. MAKHIJANI: But so they're not  
12 -- we didn't calculate where we felt the  
13 foundation was, and we didn't do the  
14 calculation for that. But that said, some of  
15 these numbers are more robust than others.  
16 You add a lot of data points, some of these  
17 conclusions may change.

18 MR. MARSCHKE: Yes. For the  
19 construction workers, we use like ten data  
20 points as the cutoff point. For the non-  
21 construction workers, I think we used 100 data

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1 points as the cutoff point. I mean, that <sup>139</sup>  
2 would be the first thing.

3 If you look at the data files that  
4 we used, and we find out that, you know, we  
5 used a couple of thousand data points and now  
6 you have a folder that has 20,000 data points,  
7 then obviously then there was a disconnect.

8 DR. TAULBEE: I don't think with  
9 tritium that's the case. I think with uranium  
10 it is, but I don't think that's the case with  
11 the tritium. I think that we've all got very  
12 similar --

13 CHAIRMAN GRIFFON: Well, why don't  
14 we start with just posting the data. I mean,  
15 I don't think we need the analysis up there.  
16 If it's going to hold things up, I certainly  
17 wouldn't want that to be a hold-up, because  
18 more of the discussion, like Jim said, is on  
19 approach and methodology.

20 DR. TAULBEE: That's right. I  
21 hope we try and get somewhere an agreement on

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1 it.

140

2 CHAIRMAN GRIFFON: So why don't we  
3 just get the data posted and then NIOSH and  
4 SC&A will work together to get a conference  
5 call scheduled. Just notify the Board,  
6 because some of us might want to dial into  
7 that as well.

8 DR. MAKHIJANI: So you want to  
9 post tritium data to start with?

10 DR. TAULBEE: Yes.

11 Finding 10

12 CHAIRMAN GRIFFON: All right, and  
13 on finding 10, do you have similar or  
14 different update? This is the tritides. This  
15 is --

16 DR. TAULBEE: The tritides issue.  
17 I have additional.

18 CHAIRMAN GRIFFON: Okay. That's  
19 what I thought. Okay. I think we're ready to  
20 move into finding 10, yes.

21 DR. TAULBEE: Okay. I actually

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1 have a slide up here that I wanted to pop up.

2 Give me just a second here. While this is  
3 coming up, let me talk to you a little bit  
4 about what we've been doing from the tritide  
5 standpoint.

6 I think from our last meeting, you  
7 had asked that we go through and look at the  
8 different tritides that have been used at  
9 Savannah River, and I think I had indicated  
10 that we felt all of them were Type M and Type  
11 F tritides, but we didn't have any Type S  
12 issues at Savannah River.

13 That was incorrect on my part. We  
14 do have some Type S. It is -- or at least we  
15 suspect that there are some Type S. And this  
16 comes down to some of the tritium beds that  
17 were worked with in the processing areas, and  
18 we're actually not sure whether they are Type  
19 S or not at this time.

20 And let me talk a little bit about  
21 what Mel's group has done here, and Mel, is

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1 they went through and identified all of the <sup>142</sup>  
2 different tritides that were out there, and  
3 then they looked for the solubility  
4 information on all of them.

5 And I believe it was 19 different  
6 ones that you've investigated, and of the 19,  
7 I believe it's eight, is that correct, that we  
8 have determined the solubility to be F for  
9 those.

10 DR. MAKHIJANI: How many?

11 DR. TAULBEE: Eight of them, ten  
12 of which we don't know yet what the solubility  
13 type is, and one of them we have confirmed to  
14 be Type S. Let me bring this up here. Okay.

15 Here we go. And so eight of them are Type F  
16 and M. One is Type S.

17 The ten that are unknown. Of  
18 these, two of them, the LANA, which is  
19 lanthanum nickel tritide or hydride, whichever  
20 way you want to call it, has been assumed by  
21 the Savannah River Site -- whoops, let me

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1 bring this up because you guys aren't seeing  
143  
2 it -- sorry. One more.

3           There we go. Okay. Lanthanum  
4 nickel beds were used rather extensively there  
5 at the site. When you look at some of the  
6 Savannah River Site's dose calculations or  
7 estimates before work would start, like doing  
8 an estimate for this particular job would  
9 involve this particular, this type of a dose,  
10 they assumed the lanthanum nickel was Type S  
11 in their calculations.

12           We don't know whether it is or  
13 not, but that was what the site assumed. So  
14 right now, we're going by the assumption that  
15 it's Type S at this particular time. So we  
16 know one of these two here. The palladium  
17 rhodium is another one that was worked with  
18 there at Savannah River, that might also be  
19 Type S, and I also point out here that this  
20 month's issue of Health Physics Journal has a  
21 new paper out on zirconium tritide, where they

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1 are indicating that it's Type S. 144

2 However, other documentation  
3 indicates that zirconium tritide is actually  
4 Type M. So there's some difference between  
5 those two that we're also still working on.

6 So what we need to do to address  
7 this hydride issue a little better, especially  
8 since we know lanthanum nickel was used  
9 extensively at the site, and it may be Type S,  
10 is, we're going through and looking at when  
11 were the lanthanum nickel beds introduced, the  
12 same with the palladium rhodium. In order to  
13 do so, we've gone back to the site and asked  
14 them for some documentation.

15 One of the things that we found in  
16 the past several months was in September of  
17 2008 -- let me back out of here real quick and  
18 see if I can't show this to you.

19 CHAIRMAN GRIFFON: Is that LANA,  
20 L-A-N-A, is that -- ?

21 DR. TAULBEE: That's its acronym,

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1 nickname. 145

2 CHAIRMAN GRIFFON: Acronym? It's

3 not L-A-N-I --

4 DR. TAULBEE: No, no.

5 DR. CHEW: It's lanthanum nickel  
6 aluminum.

7 CHAIRMAN GRIFFON: Oh, lanthanum  
8 nickel aluminum, okay.

9 DR. TAULBEE: Yes, and back in  
10 September of 2008, the Savannah River Site  
11 gave a presentation to the Savannah River Site  
12 Citizens Advisory Board, and this was kind of  
13 giving some updates of some of their work.

14 One of the things that they had  
15 done was -- is they had done some funding for  
16 New South Associates, to do these thematic  
17 studies of different areas.

18 And so you'll see here the M-area  
19 Thematic Study, the T-area Thematic Study, and  
20 we have all of these, and all of these are in  
21 the SRDB. So we have captured these documents

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1 and you can all look at them. 146

2 They're really good summaries of  
3 what took place, the history of that  
4 particular area over time. Well, if you look  
5 on the next slide here, you'll see there's a  
6 777 M study, and then there's the Tritium  
7 Thematic Study, not for public dissemination  
8 at this time. So we've gone back to the site  
9 and asked for this particular study.

10 What we're hoping is is that it  
11 contains the same type of process information  
12 that we found necessary to investigate the  
13 thorium issues, where it helped us identify  
14 some of this process information, of when  
15 things were changed. When they might have  
16 introduced these palladium rhodium alloys, as  
17 well as the lanthanum nickel.

18 So that's where we're currently at  
19 with this particular component. If we can  
20 find within the study when those were  
21 introduced, then we can go and look

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1 specifically at air sample data and smear data<sup>147</sup>  
2 during that time period, to determine what  
3 kind of levels were they seeing during these  
4 change-outs of the beds.

5           They never really broke into the  
6 beds from the standpoint of getting down to  
7 the actual hydride material. The change-out  
8 would consist of cutting a bed, you know,  
9 cutting it at its ends, sealing it, shipping  
10 that to the burial ground and putting a new  
11 one in.

12           So the potential for exposure is  
13 rather low at that time, but I'm certainly not  
14 going to say that it's zero at that time  
15 period.

16           We also believe that this work  
17 would have been done in bubble suits, but we  
18 don't have any confirmation of that. It just  
19 makes sense, due to the very high levels of  
20 tritium you're going to be dealing with in  
21 these process lines when you cut them open.

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1                   So right now what we're proposing<sup>148</sup>  
2                   to do, is, well, we're going to be getting a  
3                   copy of this particular report, or if it's a  
4                   report. If not, it might be a compilation of  
5                   tritium documents from the area, and Karen  
6                   Brown is currently working on that for us  
7                   there at the Savannah River Site.

8                   And following that information,  
9                   once we digest it, and certainly you guys will  
10                  want to read it as soon as we get it as well,  
11                  I'm sure, we might want to be conducting some  
12                  interviews to confirm, you know, what happened  
13                  in those areas during these particular bed  
14                  change-outs, and try and narrow down some of  
15                  these time windows.

16                  How often was this done? Was it  
17                  done once every ten years? Do we know when it  
18                  was done? Was it done once a year? These are  
19                  questions we currently don't have with regards  
20                  to this Type S material.

21                  And so we might also be, like I

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1 said, conducting some interviews down there,<sup>149</sup>  
2 and one of the things I wanted to ask you,  
3 Mark, was, would you all want to be involved  
4 when we conduct these interviews, or do you  
5 want to wait until after we investigate this  
6 on our own or --

7 CHAIRMAN GRIFFON: I would think  
8 it would make sense for SC&A to be involved in  
9 these.

10 DR. TAULBEE: Okay. These would  
11 likely be in classified space.

12 CHAIRMAN GRIFFON: Classified,  
13 yes.

14 DR. TAULBEE: Just due to  
15 quantities and that kind of thing. So, okay.

16 CHAIRMAN GRIFFON: And I would  
17 think that would make sense. They've been  
18 involved in those meetings before on tritide  
19 issues, so I would request that, yes.

20 DR. MAKHIJANI: Yes. Just give us  
21 enough notice, because, you know, we have to

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1 allocate the time of our people. 150

2 CHAIRMAN GRIFFON: Yes, and Tim's  
3 been pretty good with that, and just from a  
4 scheduling standpoint, I think it doesn't make  
5 sense for SC&A to wait for your report,  
6 because then they might want to interview the  
7 same people and they'd have to go through  
8 another meeting and you know, yes.

9 DR. TAULBEE: Right, okay.

10 CHAIRMAN GRIFFON: So I think that  
11 -- yes, that makes sense.

12 DR. TAULBEE: So I see this one  
13 actually taking quite a while to put to bed,  
14 and this comes down to, you know, our, I guess  
15 misunderstanding initially of the Type S  
16 materials that might have been used on the  
17 site.

18 And again, we're not solely  
19 convinced that lanthanum nickel is a Type S.  
20 It's just we've got -- we have calculations  
21 out there where they're assuming that it is at

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1 this time. So we want to interview the Health  
151  
2 Physics folks that did those calculations, of  
3 why did you assume this?

4 If the reason was, is, we felt the  
5 doses were going to be low, and so we just  
6 assumed the worse case, that doesn't  
7 necessarily make it Type S. It's, you know,  
8 just what they assumed. So those are some  
9 interviews that we feel we need to conduct.

10 CHAIRMAN GRIFFON: Although we've  
11 certainly used worst cases in many other  
12 coworker models. So I'm not sure that's a  
13 good stance to have. But, Arjun?

14 DR. MAKHIJANI: If you think it  
15 useful, I'd like to ask Joyce's opinion on  
16 this, you know, as we go along. Would that be  
17 all right if I did that?

18 CHAIRMAN GRIFFON: Of course.

19 MR. KATZ: Tim, will you just copy  
20 me when you make arrangements?

21 DR. TAULBEE: Absolutely.

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1 MR. KATZ: Thank you. 152

2 CHAIRMAN GRIFFON: One other  
3 thing. It seems like, I mean I guess the  
4 solubility class is one question. But the  
5 real focus on this is the exposure potential.  
6 Is that -- that's really what you want to get  
7 at, right?

8 DR. TAULBEE: That's right.

9 CHAIRMAN GRIFFON: You know the  
10 source terms there. But what's the likelihood  
11 of an exposure potential?

12 DR. TAULBEE: So I'm thinking that  
13 well, even with the interviews or following  
14 the interviews, we might want to have more of  
15 a -- I know we had a tour down there of the  
16 tritium facilities, but we might want to do  
17 that in a little more depth than what we got  
18 in the half hour that we were there, to better  
19 understand what that --

20 CHAIRMAN GRIFFON: Yes. They  
21 didn't really want to talk about much of that

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1 when we were there either, even though we had  
153  
2 the clearances, yes.

3 DR. TAULBEE: And one of the  
4 things we've learned recently is that we  
5 should probably be considering that tritium  
6 facility a separate site, that's under  
7 separate DOE management compared to the rest  
8 of the site.

9 So we actually have to coordinate  
10 through -- still through Karen Brown, but the  
11 actual official requests go to a different  
12 person than the site general manager. So it's  
13 a little more complicated, because it's in an  
14 NNSA site.

15 DR. MAKHIJANI: So you're -- did I  
16 get the import of what you said? Right now  
17 you're proposing to split up SRS and --

18 CHAIRMAN GRIFFON: No, no, no.

19 DR. MAKHIJANI: So I misunderstood  
20 you.

21 DR. TAULBEE: No, no, no. It

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1 makes it a little more complicated for us <sup>to</sup> <sub>154</sub>  
2 work with the site, only from the standpoint  
3 of there's different DOE management.

4 DR. MAKHIJANI: From our point of  
5 view --

6 (Simultaneous speaking.)

7 DR. TAULBEE: Just the logistics  
8 of how we go about doing this.

9 DR. MAKHIJANI: Okay, thank you.

10 DR. TAULBEE: So from that, we'll  
11 see how that goes. But I do see -- well, not  
12 necessarily, but depending on how it goes, I  
13 can see some possible data capture of their  
14 sample data and smear data some time in the  
15 future, dealing with this issue.

16 CHAIRMAN GRIFFON: Okay. Here's  
17 what. I'd like to get through, I think,  
18 finding 11 before we break for lunch, and 12  
19 is going to be a bigger discussion, I believe.

20 But 11, I'm not sure. There might just be a  
21 brief update on 11. Am I accurate on that?

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1 Finding 11 155

2 DR. TAULBEE: I don't have  
3 anything for 11.

4 CHAIRMAN GRIFFON: Right. Very  
5 brief.

6 (Laughter.)

7 DR. TAULBEE: I'm just waiting to  
8 pull that one up.

9 DR. MAKHIJANI: Exotics.

10 CHAIRMAN GRIFFON: Eleven  
11 disappeared.

12 DR. TAULBEE: Eleven disappeared  
13 from my list.

14 CHAIRMAN GRIFFON: Actually, I  
15 think SC&A is supposed to -- yes. There's an  
16 SC&A action on the action list, yes. So Arjun  
17 or Steve, I think it's fair to say you guys  
18 are still working on it?

19 DR. MAKHIJANI: Well, you know, we  
20 decided to wait on these things, you know, on  
21 the overall report, until the data issues were

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1 resolved, because you asked us to -- last<sup>156</sup>  
2 time, you asked us to do an overall report,  
3 and at a certain point when this data  
4 confusion arose and the coworker models were  
5 somewhat delayed, we didn't know whether we  
6 should proceed, since we felt we weren't  
7 working from the right data sets.

8 So part of the reason I just  
9 focused on the things that were really  
10 discrete, that were independent of that  
11 confusion, which is the TIB-0052 plutonium  
12 database and I've got something on Item 23  
13 that's not 100 percent finished.

14 CHAIRMAN GRIFFON: Can you refresh  
15 my memory? What is the essence of finding 11  
16 here? It's the exotics.

17 DR. MAKHIJANI: Well basically  
18 it's to see what documentation there is about  
19 exposure potential, and about exposure  
20 conditions and measurements. So it's not --

21 (Simultaneous speaking.)

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1 CHAIRMAN GRIFFON: So it's not <sup>so</sup> ~~157~~

2 much -- does it overlap with --

3 DR. MAKHIJANI: But the ER doesn't

4 --

5 (Simultaneous speaking.)

6 CHAIRMAN GRIFFON: Does it overlap

7 with all the coworker models that we've been

8 toggling through, or are there additional

9 exotics that we --

10 DR. MAKHIJANI: I don't remember.

11 Let me go to my task list.

12 DR. TAULBEE: I wonder, since

13 polonium is kind of one of the exotics.

14 CHAIRMAN GRIFFON: Yes, yes,

15 right, and neptunium.

16 DR. MAKHIJANI: No, I guess not.

17 It's sort of like I guess I suspended work at

18 this time period. These are suspended too.

19 So we'll just pick this up --

20 CHAIRMAN GRIFFON: Okay.

21 MR. KATZ: What is the topic,

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1            though? 158

2                   CHAIRMAN GRIFFON:     Well, that's  
3            what I was trying to find out. It's exotics,  
4            beyond the ones that we've discussed already,  
5            beyond neptunium and polonium?

6                   DR. MAKHIJANI:    Yes.

7                   CHAIRMAN GRIFFON:   Others.

8                   DR. MAKHIJANI:    There's a whole  
9            list of radionuclides.

10                  CHAIRMAN GRIFFON:   Yes. You talk  
11            about 150 radionuclides.

12                  DR. MAKHIJANI:    And that number  
13            came from somewhere. It must have come from  
14            some Savannah River --

15                  CHAIRMAN GRIFFON:   It looks like  
16            it's the TBD, yes.

17                  DR. MAKHIJANI:    And that it says  
18            in our, in the task list that I circulated to  
19            our team, was that we will look at the work  
20            spec technical reports. I do remember  
21            starting to look at these work technical

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1 reports, but after discussion with John about, <sup>159</sup>  
2 you know, keeping the budget in order, I have  
3 just focused on those discrete things.

4 But this is a discrete thing, and  
5 we should be -- we should go ahead with the  
6 item.

7 CHAIRMAN GRIFFON: Didn't we have  
8 Bob Barton identifying --

9 DR. MAKHIJANI: We did do some  
10 work on this, and at a certain point, when I  
11 suspended work and decided to focus on just a  
12 couple of discrete items, I should have  
13 revisited the list and find out how many  
14 discrete items there are that we can go on  
15 independently.

16 CHAIRMAN GRIFFON: So these are  
17 the radionuclides, the ones discussed already,  
18 and the fission product? It's not in any of  
19 those categories.

20 DR. MAKHIJANI: No. There were  
21 separate campaigns dealing with individual

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1 radionuclides that are mentioned in these work  
160  
2 technical reports.

3 The TBD writes 150. I don't know  
4 that we've identified. We certainly haven't  
5 identified 150 or time lines for that. Have  
6 you all identified time lines for these  
7 exotics? Are they there?

8 DR. TAULBEE: For some of them. I  
9 mean there was campaigns to produce cobalt 60,  
10 you know, and strontium 90 and some of the  
11 others, sure. They're there. But have we  
12 gone through systematically and done this?  
13 No, from that standpoint. Because you know,  
14 in general, the mixed fission products  
15 bioassay or whole body counting methodology  
16 picks, you know, virtually -- well, whole body  
17 counting picks up all of the data, and the  
18 methodology for the mixed fission product is  
19 prior to 1965. We pick up all of the data on  
20 this.

21 So we felt the bioassay monitoring

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1 methodology that we had pretty much covers all  
161  
2 of this.

3 CHAIRMAN GRIFFON: Okay. So it's  
4 back in. SC&A needs to follow up on that.

5 DR. TAULBEE: Yes. If there's  
6 some that would not be covered under the whole  
7 body counting or the beta counting of the  
8 urinalysis, then --

9 DR. MAKHIJANI: We have done some  
10 work on this, I see, and this must be what Bob  
11 Barton was working on.

12 CHAIRMAN GRIFFON: Bob Barton.

13 DR. MAKHIJANI: So this must be  
14 what Bob Barton was working on for us, and  
15 then he stopped.

16 (Simultaneous speaking.)

17 CHAIRMAN GRIFFON: So it's for  
18 SC&A. It is out of your hands, okay.

19 DR. MAURO: Mark, this is John  
20 Mauro. This is something I did want to  
21 explore a little further for my own benefit,

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1 because talking to Arjun, quite frankly we've<sup>162</sup>  
2 invested quite amount of level of effort in  
3 site visits, gathering data.

4 But it's my understanding that  
5 there was still quite a bit of effort going on  
6 by NIOSH in data capture and refining its  
7 coworker models. I was concerned that we  
8 really should not be moving aggressively in  
9 terms of reviewing material and capturing data  
10 until NIOSH has an opportunity to complete its  
11 work.

12 CHAIRMAN GRIFFON: Well, I don't  
13 think on this topic though, John --

14 DR. MAURO: Yes. That's where I'm  
15 a little bit disoriented, and I'm having a  
16 little trouble with the boundaries. In other  
17 words, what is the work and bear with me.  
18 Others may benefit from this too.

19 What is the work that clearly we  
20 could move forward on, productively and come  
21 to closure, and other areas where we should

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1 probably just sit tight for a while? It's not  
163  
2 really clear to me where those boundaries are.

3 CHAIRMAN GRIFFON: Yes, and it's  
4 not clear to me what these 150 nuclides are  
5 either. So I guess it starts there, and maybe  
6 if you can identify these other exotics. If  
7 to the extent they're identified in NIOSH's  
8 TBD, I don't think they are, though.

9 MR. MAHATHY: They're not in  
10 there.

11 CHAIRMAN GRIFFON: Not in there,  
12 right, right.

13 DR. MAURO: Now that being the  
14 case, okay. Let's say right now we have a  
15 concern with exotics, based on previous  
16 findings, and let's say that NIOSH is pursuing  
17 data capture and gathering information  
18 regarding the nature and extent of those  
19 exotics and how to come to grips with them.

20 I guess it would be my perspective  
21 that until that is, I guess, let's say a White

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1 Paper is issued on that subject by NIOSH, it's  
2 something -- does it really make sense for  
3 SC&A to pursue too aggressively? Or would you  
4 like to hear more from us of why we're  
5 concerned about that?

6 I guess you're trying to parse  
7 this out. I'm trying to avoid not having too  
8 much effort being put into an area that's  
9 still very much under development at NIOSH.

10 CHAIRMAN GRIFFON: Tim, do you  
11 have -- what you just stated, is that written  
12 anywhere, the approach, that you believe these  
13 other campaigns did exist. However, the  
14 current bioassay, you believe, would be  
15 sufficient to estimate those doses?

16 DR. TAULBEE: I believe that's in  
17 the original ER.

18 DR. MAKHIJANI: I don't -- Tim, I  
19 don't think it is. Let's see what it says.

20 DR. TAULBEE: It might be. I  
21 don't remember. ER position: No explicit

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1 discussion of these radionuclides. It's not  
165  
2 in the ER.

3 CHAIRMAN GRIFFON: I know, John, I  
4 agree. I know what you're saying. You want  
5 to define this work, and really it's not  
6 SC&A's role to do the research to find out,  
7 you know. If somewhere it says there were all  
8 these campaigns of the nuclides, I think it is  
9 -- it's sort of NIOSH's work to find out, what  
10 were these nuclides, and assure us that the  
11 current approach is bounding of those nuclides  
12 or whatever.

13 So yes. I think that does fall  
14 back into -- yes.

15 DR. TAULBEE: Well actually we do  
16 address it under the fission and activation  
17 products, and most of these are activation  
18 products, these special radionuclides, these  
19 campaigns. Those are activation. That's  
20 where you're absorbing the neutron and  
21 generating cobalt 60. So we're covering it

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1 all under that as part of the ER. 166

2 CHAIRMAN GRIFFON: That's what I  
3 thought.

4 DR. MAKHIJANI: What I meant by no  
5 explicit discussion is there were production  
6 campaigns for these things, and so the workers  
7 who were participating in these production, my  
8 assumption is that if you have production  
9 campaigns for radionuclides, you need to know  
10 who was exposed to it, you know, or whether  
11 they were -- that class of workers was  
12 monitored at all.

13 CHAIRMAN GRIFFON: It is sort of a  
14 dose assignment question, I guess, is what  
15 you're getting at. Who gets these --

16 DR. MAKHIJANI: Because these are  
17 not canyon type of exposures where you have  
18 mixed fission products or reactor exposures,  
19 where you might have activation products or  
20 dealing with, you know, absorbents.

21 CHAIRMAN GRIFFON: It's a discrete

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1 window of time when they did these things. 167

2 DR. MAKHIJANI: Right, and we  
3 opened -- I'll give you an example. Fission  
4 products won't cover all of it, or even  
5 activation products won't cover all of it,  
6 because we got a number of these radionuclides  
7 and we've got europium-152, you've got iodine-  
8 131, you've got iridium 192, you've got  
9 technetium-99.

10 (Simultaneous speaking.)

11 DR. TAULBEE: When you're looking  
12 at the fission product or activation product  
13 bioassay that is in the 700 area, that's those  
14 campaigns that were done. So that's where I'm  
15 a little confused, as to where your concern  
16 is. So --

17 DR. MAKHIJANI: The concern is  
18 that if you have production campaigns for  
19 iodine-131 or technetium-99, which are in very  
20 limited windows of time, that exposure  
21 potential is going to be different than

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1 exposure potential when those campaigns<sup>168</sup>  
2 weren't happening to that particular  
3 radionuclide, and you want to know whether  
4 those workers were monitored or not.

5 DR. TAULBEE: I mean that latter  
6 phrase I absolutely agree with. I'm just --  
7 I'm having trouble understanding why in the  
8 700 area, where these campaigns would have  
9 been taking place, and we have this data  
10 during those time periods, that I mean are you  
11 asking me to go through and identify all of  
12 the workers that worked with each of these  
13 production campaigns?

14 DR. MAKHIJANI: Well, I don't know  
15 --

16 (Simultaneous speaking.)

17 DR. TAULBEE: If that's the case,  
18 then --

19 CHAIRMAN GRIFFON: No, no, no. I  
20 think we're asking what the approach is going  
21 to be in general, you know.

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1 DR. MAKHIJANI: Yes, that's it. 169

2 CHAIRMAN GRIFFON: If you're  
3 saying you're going to apply a coworker model  
4 using this approach, you know, something like  
5 TIB-0054 or whatever to all workers that were  
6 in the 700 area for these years, then I think  
7 that's what you're looking for, or SC&A is  
8 looking for.

9 Well, and partially it's a limit.  
10 Are there others that don't fall into the  
11 activation or fission.

12 DR. TAULBEE: I mean first and  
13 foremost, we use the individuals, their  
14 dosimetry data --

15 CHAIRMAN GRIFFON: Right, right.

16 DR. TAULBEE: So from the 700  
17 area, you could take all of those people --

18 CHAIRMAN GRIFFON: So if they had  
19 that data, then yes.

20 DR. TAULBEE: Right, and those  
21 people that, you know, were not monitored in

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1 that area, we would apply the coworker model<sup>170</sup>

2 CHAIRMAN GRIFFON: Which is under  
3 development still?

4 DR. TAULBEE: Which is under  
5 development for the mixed fission products in  
6 particular, and activation, because they're  
7 lumped together. It's a beta analysis --

8 DR. MAKHIJANI: And when you do  
9 your coworker model, are you going to parse it  
10 by area, like 700 area, 300 area? Or do you  
11 have a Savannah River Site-wide coworker  
12 model?

13 DR. TAULBEE: The general approach  
14 has been Savannah River Site-wide. However,  
15 that doesn't mean that we can't parse it by  
16 the 700 area.

17 Currently, that data is still  
18 being proofed. So we don't know. This is the  
19 whole body count data that's being proofed.  
20 We have the data through 1965 now, urinalysis-  
21 wise, that we could go through and look at

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1 that. That includes the 200 area -- 171

2 CHAIRMAN GRIFFON: So now I am  
3 maybe rethinking this, because I think John  
4 might be right, that you know, we should wait  
5 and see. One thing I would ask is if SC&A has  
6 some information on these exotic radionuclides  
7 that they feel don't fall into the activation  
8 product or fission product arena, you know,  
9 then at least look into those or identify  
10 those so that NIOSH, you know, is aware of  
11 those.

12 But beyond that, I think we need  
13 to wait and see what the approach is on the  
14 coworker model for these things, and then SC&A  
15 can look at it and say well, we don't think  
16 this approach is adequate or whatever, you  
17 know.

18 DR. MAURO: Mark.

19 CHAIRMAN GRIFFON: Go ahead, John.

20 DR. MAURO: Yes. I think we,  
21 SC&A, have an obligation to clearly articulate

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1 our concerns and with the substantiation of  
2 why we have those concerns. At that point,  
3 give NIOSH an opportunity to, you know,  
4 respond to those concerns.

5 It sounds like that -- I just want  
6 to make sure that Arjun, do you feel  
7 comfortable that our concerns regarding this  
8 matter have been clearly communicated, so that  
9 it's at least -- I don't want to leave NIOSH  
10 in the uncomfortable position of they're not  
11 quite sure what we're concerned about.

12 That's the only -- so the extent  
13 to which we can communicate that perhaps  
14 better if we haven't, to NIOSH, and if NIOSH  
15 is then in the process of either gathering  
16 data, parsing it, building a coworker model,  
17 perhaps by area or campaign, then we really  
18 are lined up the way we should be.

19 I was a little concerned that -- I  
20 don't know. Is there anything more than we  
21 could do? I guess this is a question to Arjun

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1 or Mark. Do you feel that we have, there's  
2 more we could do to better explain our  
3 concerns, so that this could move forward  
4 productively?

5 DR. MAKHIJANI: Yes. Well you  
6 know, what I should do is to reduce the  
7 central concern we've been talking about to  
8 writing, so that it's not left to a transcript  
9 and a gut. Then share with the Working Group  
10 and NIOSH the table that we have prepared.

11 It's not a complete table of  
12 initial work. Now some of these radionuclides  
13 are covered in what we've talked about, the  
14 curium and californium and so on. But others  
15 are not, and so we'll just share that table  
16 with you.

17 We can either work further on it  
18 and try to make it as complete as we can, and  
19 then share it, or we can share it now, along  
20 with -- you know, in short order, along with a  
21 memorandum saying here's our concern: Do we

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1 have some way to relate the exposure of the  
2 people who worked with these things during  
3 production campaigns to the data set that we  
4 have, and the coworker model that you're going  
5 to be preparing?

6 CHAIRMAN GRIFFON: I mean my  
7 initial feeling would be to share what you  
8 have, because if there are other nuclides that  
9 sort of NIOSH looks through the list and says  
10 yeah, we're working on this coworker model,  
11 we're working on this, this falls under  
12 fission and it covers all of them, then you  
13 know, I don't know that we have to go much  
14 further, unless --

15 I'm also thinking back to the --  
16 but also I'd like to where this statement came  
17 from regarding the 150 other nuclides or  
18 whatever. It is in the TBD version, right?  
19 Yes, I see you're looking at --

20 DR. MAKHIJANI: The evaluation,  
21 SEC Evaluations.

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1 CHAIRMAN GRIFFON: Right. 175

2 DR. MAKHIJANI: I think the 150  
3 came from the TBD.

4 MR. MAHATHY: But it -- that  
5 version hasn't been published.

6 CHAIRMAN GRIFFON: Yes. It's an  
7 earlier version.

8 (Simultaneous speaking.)

9 DR. MAKHIJANI: We have that  
10 version because version 4E was the point of  
11 reference for this, yes, and it's explicitly  
12 mentioned in there.

13 DR. TAULBEE: What page were you  
14 looking at in the ER? I'm sorry.

15 CHAIRMAN GRIFFON: In the ER  
16 report, what page is that?

17 MR. MARSCHKE: Page 49.

18 DR. TAULBEE: Thank you.

19 MR. MARSCHKE: The top of page 49.

20 CHAIRMAN GRIFFON: And your point  
21 on page 49 is -- you've got it, Steve. Tell

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1           them. 176

2                       MR. MARSCHKE:       Well, they're  
3 talking about americium, the whole discussion  
4 really is on americium. But it's almost -- in  
5 the Evaluation Report, it's almost an aside.  
6 You're talking about symbols containing  
7 americium, curium 244 and 150 nuclides of 66  
8 elements.

9                       So it looks like, you know, and so  
10 that just a red flag out there, you know.  
11 What are these 150 radionuclides for these 66  
12 elements?

13                      DR. MAKHIJANI:       And that's the  
14 reason for that point basically.

15                      MR. MARSCHKE:       And there is a SR,  
16 Savannah River company memorandum or paper or  
17 something or a report or something that is  
18 given as the source, I guess, of that  
19 information, which I don't know if we looked  
20 at it.

21                      DR. MAKHIJANI:       Bob might have

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1 looked at it. I don't know. I'll have to go  
2 back and ask.

3 MR. MARSCHKE: We have to look at  
4 it, yes.

5 CHAIRMAN GRIFFON: So I would say  
6 SC&A should share what they have now, and then  
7 let NIOSH crosswalk that with their current  
8 work that's going on, their coworker models,  
9 whatever they have, and look back to this  
10 reference as well and give us some feedback on  
11 that.

12 DR. TAULBEE: So NIOSH will do  
13 that?

14 CHAIRMAN GRIFFON: Yes, I think  
15 so.

16 DR. TAULBEE: So we'll share what  
17 we have now and NIOSH --

18 (Simultaneous speaking.)

19 CHAIRMAN GRIFFON: That's a NIOSH  
20 research function, not a --

21 MR. KATZ: Yes. I'm just unclear.

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1       What was the January task to SC&A that we<sup>178</sup>  
2       been talking about though?    What was SC&A  
3       asked to do in January that --

4                   DR. MAKHIJANI:    We were asked to  
5       look at these technical work reports.

6                   CHAIRMAN GRIFFON:   Which I think  
7       really is --

8                   DR. MAKHIJANI:    SC&A will look at  
9       work technical reports to see if incidents  
10      were catalogued there.   So the initial concern  
11      around these 150 radionuclides wasn't just, is  
12      there routine bioassay data.

13                   It was probably motivated by our  
14      experience in Y-12, where there were also, you  
15      know, a good bit of the periodic table, and  
16      where --

17                   CHAIRMAN GRIFFON:    What we're  
18      calling the Y-12, now I see the Y-12 reference  
19      in the matrix.

20                   DR. MAKHIJANI:    Yes.    It is there  
21      in the matrix.

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1                   CHAIRMAN GRIFFON:       The whole<sup>179</sup>  
2                   argument on Y-12, in part, I think was that  
3                   they were totally sealed and there was no  
4                   exposure potential.       Then we found some  
5                   incidents and that sort of became an issue.  
6                   Is that right Jim?   I'm sort of trying to  
7                   recollect --

8                   DR. CHEW:        I remember cyclotron  
9                   and the --

10                  CHAIRMAN GRIFFON:   -- yes, right.

11                  DR. CHEW:        -- Jim, we worked on  
12                  that.

13                  CHAIRMAN GRIFFON:   Yes, I think  
14                  Mel worked on that.

15                  DR. NETON:        I remember the  
16                  cyclotron.

17                  CHAIRMAN GRIFFON:   But I think the  
18                  initial -- anyway, I don't know. I think part  
19                  of the initial argument was they're sealed.  
20                  There's no potential, you know, very limited  
21                  potential for exposure.   Then we found some

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1 incident reports. NIOSH found some incident<sup>180</sup>  
2 reports.

3 DR. TAULBEE: I mean we'll look at  
4 that report a little more closely. It does  
5 look like that these were likely sealed, but  
6 we want to look closer into this.

7 CHAIRMAN GRIFFON: So yes.  
8 There's a laundry list of nuclides, but also I  
9 think we need to consider the exposure  
10 potential.

11 DR. NETON: In Y-12, I think we  
12 also had some laboratory sources, right? But  
13 they were the small quantities.

14 DR. CHEW: Well, there were a  
15 couple of incidences where the targets were  
16 burnt through, ruptured.

17 CHAIRMAN GRIFFON: Right, right.  
18 That's right.

19 DR. CHEW: But the breakouts were  
20 done under conditions.

21 MR. KATZ: So Arjun, SC&A will

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1 have a little memo or something to the Work  
181  
2 Group about this?

3 DR. MAKHIJANI: Yes, just  
4 explaining --

5 CHAIRMAN GRIFFON: I didn't think  
6 that one would take as long as it did, but we  
7 needed an update as to where we were. So that  
8 was good, yes. All right. I think we're  
9 ready for a lunch break. On the phone, we'll  
10 be back at 1:15.

11 DR. MAURO: Okay.

12 CHAIRMAN GRIFFON: All right,  
13 thank you.

14 MR. KATZ: Thank you everybody.

15 (Whereupon, the above-entitled  
16 matter went off the record at 12:17 p.m. and  
17 resumed at 1:22 p.m.)

18

19

20

21

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1 the issue, and then sort of give an update<sup>184</sup>  
2 where we're at.

3 According to my action task list,  
4 I have a couple of actions for both SC&A and  
5 NIOSH. One is related to TIB-0052, which is a  
6 plutonium coworker model, I believe.

7 DR. MAKHIJANI: Is that under 12?

8 Finding 12

9 CHAIRMAN GRIFFON: Yes. This is  
10 under issue 12. The other is related to I  
11 think -- well, it says log books.

12 DR. MAKHIJANI: Mark, I think the  
13 TIB-0052 is different.

14 DR. NETON: I think it's in 13.

15 CHAIRMAN GRIFFON: Okay. It's  
16 listed under 12 on this action list. All  
17 right. Well let's just go ahead. Start with  
18 12, and if someone can summarize what the  
19 issue is --

20 DR. TAULBEE: I can tell you what  
21 we have, what we thought the issue was.

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1 CHAIRMAN GRIFFON: Okay, all  
185  
2 right.

3 DR. TAULBEE: And this was dealing  
4 with incidents and investigations, and I  
5 believe you asked for us to find a criteria  
6 for what constituted a special hazard  
7 investigation report. We have gone through  
8 DPSOP-40, historical versions of that, and  
9 have identified those.

10 Basically, it's the acts or  
11 conditions which caused or could have caused  
12 radiation contamination hazards, incidents of  
13 contamination which required costly cleanup or  
14 that concerned Health Physics. I'm reading  
15 kind of directly here from the DPSOP-40.

16 CHAIRMAN GRIFFON: Can you say  
17 that acronym again?

18 DR. TAULBEE: D-P-S-O-P dash 40.  
19 This was their radiological control  
20 procedures.

21 DR. CHEW: DuPont's.

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1 DR. TAULBEE: DuPont's, yes. What  
186  
2 was it, DuPont's?

3 DR. CHEW: DuPont's Standard  
4 Operating Procedures.

5 DR. TAULBEE: Yes. DuPont's  
6 Standard Operating Procedure. Then one of the  
7 other was incidents that caused internal body  
8 contamination or concern to Health Physics and  
9 medical. So from this, what we recognize is  
10 that not all incidents, especially what  
11 workers might consider incidents, would be  
12 included in these special hazards  
13 investigations reports. But these are the  
14 major incidents that would have occurred.

15 We have found in our studies of  
16 Savannah River Site records that there are  
17 incidents noted in individual personnel files,  
18 where skin contamination, that type of thing,  
19 does not necessarily prompt a special hazards  
20 investigation.

21 In addition, when there is an

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1 unusual occurrence, I guess I would say<sup>187</sup>  
2 something along those lines, we'll find an  
3 annotation in the Health Physics log books,  
4 and they will mention, you know, we took nasal  
5 smears on these people. Those aren't in the  
6 special hazards investigations.

7 So really the SHIs are kind of the  
8 top level major accidents and incidents that  
9 happened at the Savannah River Site over the  
10 years. There's 499 of these, so these are the  
11 ones that, you know, were significant that  
12 occurred. I'm sure --

13 CHAIRMAN GRIFFON: And that's a  
14 database, right, the SHI isn't it?

15 DR. TAULBEE: It's actually not a  
16 database. These are individual reports that  
17 we've obtained from the site, detailing each  
18 of the individual incidents.

19 DR. MAKHIJANI: And there is an  
20 index, though.

21 DR. TAULBEE: There is an index,

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1 yes, to that. But this is one of the <sup>188</sup>  
2 components that I think went into that  
3 incident database that you all have talked  
4 about some. So this was kind of the first cut  
5 at that, and then they started going through  
6 the Health Physics log books.

7 There's also incidents mentioned  
8 throughout the monthly technical reports, the  
9 works technical reports. You will see on  
10 every month a different incident or so that  
11 had occurred, that didn't rise to the level of  
12 the special hazards investigations. But they  
13 are documented there in those reports.

14 So my understanding, and Arjun  
15 please correct me if I'm wrong here, but the  
16 incident database that had been talked about a  
17 lot during the TBD review, really is comprised  
18 of first, the special hazards investigations,  
19 going through all the monthly technical  
20 reports. Then the Health Physics log books.

21 That's kind of the tier of how

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1 that database was developed, having all <sup>189</sup>of  
2 these incidents into one place.

3 DR. MAKHIJANI: Which database,  
4 the tank farm database?

5 DR. TAULBEE: Yes.

6 DR. MAKHIJANI: Well, you know, I  
7 personally don't know how the tank farm  
8 database was developed. I looked at in a  
9 previous incarnation before, long before this  
10 project in the 1980's from Bob Alvarez, who  
11 got it through a Freedom of Information Act  
12 request.

13 There were 14,000 incidents in the  
14 tank farm that were listed in there. He  
15 dropped it in my lap and said do something  
16 with this. So that's how I actually -- and  
17 then there was a safety analysis report that  
18 went along with it more or less, and some  
19 models for failure rates and so on that were  
20 derived from it.

21 So unfortunately that data, that

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1 printout was later lost at the Environmental ~~190~~  
2 Policy Institute, and but I had actually  
3 catalogued them for the report I did for the  
4 Institute. That's what this is from. I  
5 personally do not know, other than what was in  
6 the data bank itself, what went into it.

7 But it was very clear that the  
8 frequency of incidents increased greatly over  
9 time. So the data recording, it wasn't the  
10 actual number of incidents that increased. I  
11 didn't, I don't think that that was the case.

12 It was the recording practices  
13 that changed, and actually I noted in there  
14 that before 1965, we didn't. So there were  
15 actually -- and even in this data bank, there  
16 were incidents that were not in the special  
17 hazards investigation that appeared to be, you  
18 know, of some magnitude, which is why we  
19 raised it in the TBD review, that how do you  
20 take those incidents into account? Are they -  
21 - you know, now we have looked at individual

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1 worker dose records, and we don't have the  
191  
2 identity of the workers who are involved in  
3 the incidents that are listed in the data  
4 bank.

5 So you have -- you have a spill of  
6 high level waste or some incident that is  
7 serious, and you got radiation rates that are,  
8 you know, in the several rem or 10 to the  
9 roentgen per hour, and but we don't know who  
10 those workers are.

11 So we can't go to their files and  
12 see whether there's any incident logged.  
13 Since we did not find incidents of some  
14 magnitude in the SHI index, even -- yes. So  
15 we kind of raised a question as to how,  
16 whether the incident record's complete. Then  
17 when the SEC, that was during the TBD.

18 When the SEC petition was filed,  
19 the petitioners raised the same concern, that  
20 they were in incidents that didn't seem to be  
21 recorded anywhere.

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1 DR. TAULBEE: And in general, they<sup>192</sup>  
2 are recorded in their individual files, is  
3 where really the baseline level is. So just  
4 to kind of re-summarize here, the special  
5 hazards investigations are the top level.

6 DR. MAKHIJANI: Right.

7 DR. TAULBEE: Then you've got  
8 mention in the monthly reports and weekly  
9 reports, and then you've got the Health  
10 Physics log books, and then you also have kind  
11 of parallel going on here is the Health  
12 Physics monitoring. Within their individual  
13 files, you'll see the skin contamination  
14 incidents or potential for inhalation, and  
15 they sent the individual for a special whole  
16 body count or for a follow-up bioassay.

17 You'll see those annotations in  
18 the individual files. I'm not sure how you  
19 want, how you would go about correlating this?

20 (Simultaneous speaking.)

21 MR. MAHATHY: We do have a

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1 document that we reviews the tank farm. ~~Have~~  
193

2 you seen that one? It's SRDB No. 76064.

3 DR. MAKHIJANI: Probably not. 76

4 --

5 MR. MAHATHY: 76064.

6 DR. MAKHIJANI: 76064.

7 MR. MAHATHY: And I think I ought  
8 to mention there's three of them.

9 DR. MAKHIJANI: Three what?

10 MR. MAHATHY: It was a technical  
11 report they put on that database, I used 30  
12 incidents as an example.

13 DR. MAKHIJANI: What is the date  
14 of that report?

15 MR. MAHATHY: Eighty-five.

16 DR. MAKHIJANI: Oh, '85.

17 CHAIRMAN GRIFFON: It's a review  
18 of the tank farm database?

19 MR. MAHATHY: Yes.

20 CHAIRMAN GRIFFON: Do you guys  
21 have the tank farm database?

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1 DR. MAKHIJANI: No. We were not <sup>194</sup>

2 -

3 CHAIRMAN GRIFFON: You never  
4 received it.

5 DR. MAKHIJANI: There was a fair  
6 amount of effort devoted both by NIOSH and us,  
7 and at some point jointly, I think. This may  
8 have been while you were leave.

9 DR. TAULBEE: Long term training  
10 was not leave.

11 (Laughter.)

12 DR. MAKHIJANI: Not participating  
13 in the project, where Kathy, I think, maybe --

14 CHAIRMAN GRIFFON: Yes, I was  
15 there. I was there.

16 DR. MAKHIJANI: Tried to recover  
17 this particular database.

18 CHAIRMAN GRIFFON: Actually,  
19 that's when Sam -- that's why somebody may  
20 have thought Sam was there.

21 DR. MAKHIJANI: It seems to have

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1 DR. TAULBEE: The title of it is ~~is~~  
2 Incidents at the Savannah River Site Waste  
3 Tank Farms.

4 DR. MAKHIJANI: That's right.

5 CHAIRMAN GRIFFON: What's the  
6 number on that document, just so we --

7 MR. MAHATHY: Oh, you mean that  
8 one. Okay. SRDB 76064.

9 DR. MAKHIJANI: And I'm reasonably  
10 confident that --

11 CHAIRMAN GRIFFON: I'm sorry seven  
12 --

13 MR. MAHATHY: 76064.

14 CHAIRMAN GRIFFON: Okay, thank  
15 you.

16 DR. MAKHIJANI: I'm reasonably --  
17 just so, I sent this in a cover memo, but just  
18 since it has come up, I'm reasonably confident  
19 that overall it is accurate. But because the  
20 data bank was lost, it was never proofread.

21 So I'm not 100 percent sure that

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1 every single number in it is right, that <sup>my</sup><sub>197</sub>  
2 handwriting was transcribed properly when it  
3 was typed. So it's just kind of unfortunate  
4 what happened.

5 MR. MAHATHY: It gives a summary -  
6 - go ahead.

7 DR. TAULBEE: Okay. I was just  
8 going to say that, you know, so from the  
9 incident standpoint, we recognize that the  
10 special hazards investigations don't cover all  
11 incidents that workers might define as an  
12 incident, and clearly it doesn't. It's just  
13 the highlight that's there.

14 But we do feel that the others are  
15 covered in their individual files when they  
16 were significant and they did follow-up  
17 bioassay or sent through the whole body counts  
18 and so forth. So I'm not sure what determines  
19 --

20 DR. MAKHIJANI: Well, yes. I  
21 don't know how you want to proceed on that.

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1 You know, and I don't know that that's right,<sup>198</sup>  
2 because we only looked at the SHI index. The  
3 point of this, in this context, because the  
4 petitioners have also raised it. So I don't  
5 know how you want to resolve.

6 DR. NETON: Well, we've had  
7 discussions about incidents before. It seems  
8 like this comes up almost every time.

9 DR. MAKHIJANI: Right, right.  
10 Right, it does.

11 DR. NETON: For internal exposures  
12 anyway, the episodic models that we developed  
13 of coworkers usually encompass those episodic  
14 type incidents that have been occurring. We  
15 got that very early on in the program.

16 DR. TAULBEE: Savannah River has  
17 got coworker models using the highest sample  
18 per person per year. Some of these upper tail  
19 exposures are clearly from incidents. Those  
20 are not routine.

21 DR. MAKHIJANI: We need some

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1 guidance from you as to -- 199

2 CHAIRMAN GRIFFON: Well, I'm not  
3 sure, and the only thing is, you were  
4 mentioning some with possibly high external --

5 DR. NETON: External is a  
6 different scenario, and --

7 DR. MAKHIJANI: That's a separate  
8 geometry type of question, because I think the  
9 tank farm had some very particular geometries,  
10 and would especially affect that structure.

11 DR. TAULBEE: But that's issue 20,  
12 isn't it?

13 DR. MAKHIJANI: Yes, and then  
14 there was the question of not, you know,  
15 badges not being worn on weekends and so on,  
16 and we've done -- that's Item 23, and we kind  
17 of -- Steve, you know, we compiled all of the  
18 affidavits and made a spreadsheet of that. Of  
19 course, we've interviewed a number of these  
20 people.

21 There are some things appear to be

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1 not -- well, we'll come to that when we  
2 discuss 22. 200

3 CHAIRMAN GRIFFON: I mean the  
4 other -- I know what Jim's saying. The other  
5 question that might get to some of the  
6 petitioners' concerns is some mention that the  
7 files contain a lot of these individual, you  
8 know, when people were -- when it tripped a  
9 special, you know, sort of maybe a special  
10 bioassay is needed or whatever.

11 That would be in the individual's  
12 file, and I don't know that there's any way to  
13 crosswalk like the tank farm database, you  
14 know, to see --

15 DR. MAKHIJANI: No. It doesn't  
16 seem possible because their names are not --  
17 we don't have names. We don't have any IDs in  
18 the tank farm database.

19 CHAIRMAN GRIFFON: Okay, right,  
20 right.

21 DR. MAKHIJANI: And you know, all

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1 we have is my notes on it. But I looked at <sup>201</sup>  
2 that thing for quite a while and made longhand  
3 notes from it. I do not recall any personal  
4 identifiers.

5 CHAIRMAN GRIFFON: I mean the only  
6 thing that kind of piqued my interest on this  
7 was that you mentioned that the tank farm, at  
8 least on your preliminary review of the tank  
9 farm database, seemed to have some accidents  
10 that, you know, sort of in your professional  
11 judgment, there's a level of being in SHI, you  
12 know.

13 DR. MAKHIJANI: Because you have  
14 external radiation dose rates from incidents  
15 that are in the tens of roentgen, 10 R per  
16 hour, 20 R per hour, 50 R per hour. So I  
17 would you expect that those things would be in  
18 the SHI index, and we had some other examples  
19 of that in the TBD review also.

20 I mean we kept a lot, I think  
21 several. So that -- but where we go with that

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1 in terms of is it someplace else, I don't  
2 know.

3 CHAIRMAN GRIFFON: Right.

4 DR. TAULBEE: Well I guess, you  
5 know, when you mentioned some of these  
6 incidents, you know, that you feel should have  
7 -- in your opinion should have probably been  
8 in an SHI database.

9 DR. MAKHIJANI: Based on the  
10 definition that you've read.

11 DR. TAULBEE: Without going to the  
12 individual's files, there very well could be a  
13 discussion, you know, about that potential  
14 exposure or that exposure scenario in their  
15 file, their individual files, especially if  
16 it's skin contamination involved. I've seen  
17 so many hundreds of skin contamination  
18 incidents in personal files that my impression  
19 is is that they would be in there.

20 To me, possibly they should have  
21 been in SHI at the time; who knows. But there

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1 was follow-up that was done in the individual<sup>203</sup>  
2 files and so when we do dose reconstruction we  
3 see that, and we incorporate that, especially  
4 if they have skin cancer.

5 DR. MAKHIJANI: This is a pretty  
6 big point for the petitioners, and one of the  
7 things, I mean, and it seemed to be a hard  
8 one, to kind of -- because sometimes you're  
9 trying to prove a negative. It's been  
10 discussed before, you know.

11 But it may be that we could pull  
12 from the -- and I think the concern would be  
13 bigger over the years probably. We could pull  
14 some tank farm worker, especially a  
15 construction worker claim file, and take a  
16 look at that, and try to match them --

17 (Simultaneous speaking.)

18 DR. MAKHIJANI: No, from the claim  
19 file, and try to match them with --

20 CHAIRMAN GRIFFON: Yes. People  
21 that worked in the tank farm area you mean,

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1           okay. 204

2                       DR. MAKHIJANI:    --in those dates  
3           and match them with the dates.  You know, it's  
4           a long shot, but I don't know --

5                       CHAIRMAN GRIFFON:  Yes, I know.

6                       DR. TAULBEE:    I don't know if we  
7           could readily do that.

8                       MR. MARSCHKE:  We do have, I mean  
9           the claimants, the petitioners in their  
10          affidavits have identified -- you know, where  
11          they've identified, where they think an  
12          incident was missing.  I mean we could  
13          probably -- you could look at that person's  
14          file and see whether or not it was addressed  
15          or not addressed.

16                      DR. MAKHIJANI:  But half of the  
17          petitioner affidavit writers are not  
18          claimants, about.  Would you say that?

19                      MR. MARSCHKE:  No, they're not  
20          construction workers.

21                      DR. MAKHIJANI:  Oh, they're not

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1 construction workers? 205

2 MR. MARSCHKE: Half of the  
3 petitioners are not -- because that's what I  
4 said. Half of them are not construction  
5 workers. I don't know how many of them are  
6 claimants or not. But even if they're not  
7 claimant, you could, you know, ask for their  
8 records to be retrieved, and look and see what  
9 is in the dose records for these 13 or so  
10 petitioners.

11 DR. MAKHIJANI: We could do that.

12 MR. MARSCHKE: And actually I do  
13 remember one of the petitioners talked about  
14 an incident which I believe is in the SHI.  
15 There is an SHI. There are certain  
16 differences. The year is different, whether  
17 or not the CAMs were alarmed or not is some  
18 differences.

19 But general description of the  
20 event is very similar. Same number of people,  
21 same area, same task that they were working

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1 on. So you know, so the fact is some of these  
2 may be --

3 Some of the events which the  
4 petitioners have raised may be in the SHIs,  
5 but other ones, I mean we do have -- I mean at  
6 least we have a name, an individual's name,  
7 and we could probably, you know, go and find  
8 their file, and see whether or not the file  
9 reflects what they're just talking about.  
10 Does that make, you know, sense?

11 DR. MAKHIJANI: Yes. We could do  
12 that.

13 CHAIRMAN GRIFFON: That's, of  
14 course, if they've made their specific  
15 allegations.

16 MR. MARSCHKE: Yes, and there's  
17 only 13, and I don't know that all 13 of those  
18 petitioners raised this concern. I think  
19 probably only a handful of them. So you would  
20 just have like a handful of them to maybe  
21 track down.

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1                   CHAIRMAN GRIFFON: Does NIOSH have  
2 access to the records if they're not a  
3 claimant?

4                   DR. TAULBEE: If they're not a  
5 claimant, we have to request them.

6                   CHAIRMAN GRIFFON: Yes.

7                   DR. TAULBEE: The site's been very  
8 cooperative along those lines, so it's  
9 certainly possible to obtain them.

10                  DR. NETON: I thought we had a  
11 master inventory of SRS exposure records.

12                  DR. TAULBEE: Oh we do, we do.  
13 But in order to get to the incident  
14 information --

15                                 (Simultaneous speaking.)

16                  DR. NETON: Yes. The other stuff  
17 is just database.

18                  CHAIRMAN GRIFFON: Yes. Right,  
19 right.

20                  DR. TAULBEE: I mean we've got all  
21 the bioassay logs and the external logs.

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1 (Simultaneous speaking.) 208

2 DR. TAULBEE: A discussion of an  
3 incident.

4 CHAIRMAN GRIFFON: Right. I think  
5 that may be one useful aspect. I'm not -- and  
6 I think Tim, you said that the tank farm, the  
7 possibility was doable from NIOSH's  
8 standpoint, that you could identify --

9 I mean this is another track. The  
10 one that Arjun was mentioning, look at tank  
11 farm workers and pull people that worked in  
12 the tank farm area. You said that was  
13 possible.

14 DR. TAULBEE: We can pull them,  
15 yes.

16 CHAIRMAN GRIFFON: I think this  
17 might be a better first step, just to follow  
18 up on these 13, you know.

19 DR. TAULBEE: So if I'm  
20 understanding what you're asking us, is to go  
21 through those affidavits, the 13, and those

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1 that are specifically talking about incidents,<sup>209</sup>  
2 pull those out and look at those individual  
3 files.

4 DR. NETON: Doesn't NIOSH do that?

5 CHAIRMAN GRIFFON: Yes.

6 DR. TAULBEE: Or do you want SC&A  
7 to do that?

8 DR. NETON: Don't they have to  
9 request the records?

10 CHAIRMAN GRIFFON: Yes. They've  
11 got to get the records, but I'm not sure it's  
12 not on SC&A, because it's their concern about  
13 the, you know. So I would say NIOSH obtain  
14 the data, but then verify that the 13 names  
15 either are all claimants, or if they're not,  
16 get those records and then SC&A should review  
17 those, to see what's going on, regarding the  
18 incidents that the people reported, yes.

19 DR. TAULBEE: Okay.

20 CHAIRMAN GRIFFON: So really, I  
21 guess what you're trying to investigate is

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1       whether these people that raised concerns<sup>210</sup>  
2       about certain incidents, whether they're  
3       included in their individual -- the incidents  
4       they raised concerns about, were they always  
5       involved in them personally or do you know  
6       that?

7                   DR. TAULBEE:    I think so.    I've  
8       got a spreadsheet somewhere.

9                   CHAIRMAN GRIFFON:    Okay, because  
10       it's not going to work if they're talking  
11       about some other incident.

12                   DR. TAULBEE:    They'll see that  
13       when they go look at the affidavit.

14                   CHAIRMAN GRIFFON:    Yes, yes.

15                   MR. MARSCHKE:    That's one of the  
16       problems with the SHI, is the SHIs back in the  
17       early 50's or back in the 50's when they first  
18       started them, they identified the individuals.

19       Then somewhere later on, I'm not sure exactly  
20       when, but they started editing out that  
21       information.    So the SHIs don't really tell

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1 you, you know, [identifying information  
2 redacted] was exposed. 211

3 DR. TAULBEE: What you will find,  
4 to follow up to that Steve, you're absolutely  
5 right, is that when you're going through an  
6 individual's file, you'll sometimes see that  
7 SHI report in their individual file. So then  
8 you know this is one of the people who was  
9 involved with it.

10 MR. MARSCHKE: Right, right.

11 DR. MAKHIJANI: What we can do to  
12 try to make the communication easier is we  
13 already have a spreadsheet with all  
14 petitioners, with a worksheet for each  
15 petitioner. I will just put it in the same  
16 file, where I put those other file  
17 spreadsheets. We'll put it there, so you can  
18 look at who we're talking about.

19 DR. TAULBEE: Okay.

20 CHAIRMAN GRIFFON: That will be  
21 helpful, yes. All right. I mean the only

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1 other concern I have on this one is going back  
2 to that tank farm database and these ones that  
3 you believe likely were SHI type of incidents.

4 DR. MAKHIJANI: Yes.

5 CHAIRMAN GRIFFON: And I'm  
6 wondering if there's anything we can do with  
7 maybe not all of those, but if you have a  
8 specific one, you know, four or five of those.

9 DR. MAKHIJANI: We listed several  
10 in the TBD review. What I might suggest for  
11 your consideration is if I can just maybe send  
12 that list again to Tim, and you can try to  
13 make a judgment as to, you know, some of these  
14 things are pretty serious.

15 So and that's what I'm thinking  
16 about. I can refer them to you and send them  
17 to the Work Group of course, or make a little  
18 spreadsheet and put it in the same place and  
19 send you a note.

20 (Simultaneous speaking.)

21 DR. MAKHIJANI: And give us a

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1 judgment as to whether these things should  
2 have been in the SHI or whether this --  
3 because my feeling is that SHI initially was  
4 not being maintained in the early years.

5 CHAIRMAN GRIFFON: And I guess  
6 also the bottom line, is what I'm interested  
7 in, is even if these weren't in the SHI and  
8 they possibly should have been, given the  
9 conditions described, we believe that our  
10 methodology, you know, is still adequate for  
11 the following reasons, you know.

12 Particularly I'm worried about the  
13 -- because there's also allegations about the  
14 badging practices and stuff. So it may not be  
15 only an internal or a coworker internal model;  
16 it might be other issues. So all right.

17 So there's two actions on this  
18 then? We're going to get the 13 people,  
19 follow up on those 13 people and then follow  
20 up on these I don't know how many --

21 DR. MAKHIJANI: Yes, and I have

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1 two minor sort of data information type ~~214~~  
2 items to put, and I'll send you all an email  
3 when it's done.

4 CHAIRMAN GRIFFON: Okay.

5 DR. MAKHIJANI: It should be done  
6 fairly soon.

7 CHAIRMAN GRIFFON: All right.  
8 Okay. Now 13 may actually get into what I was  
9 starting to talk about before perhaps. This  
10 task list is a little bit overlapping, I  
11 think. So I apologize, but --

12 DR. MAKHIJANI: Yes. That's the  
13 TIB-0052. Now we sent you a report about  
14 that, about a week or ten days ago.

15 DR. TAULBEE: I'm relying on you,  
16 because I have not -- as Jim, I have not read  
17 Arjun's report yet on that particular issue.  
18 So this is dealing with the TIB-0052.

19 DR. MAKHIJANI: Yes. I mean I can  
20 summarize it for you if you want.

21 DR. TAULBEE: Please do.

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1 DR. MAKHIJANI: Yes. I mean <sup>it</sup>~~it~~<sub>215</sub>  
2 didn't go out that long ago. It's not long.  
3 It's only about 12 pages.

4 Basically, we compiled the data,  
5 and the data are only for plutonium, and we  
6 kind of looked to verify NIOSH's statement  
7 that the number of below MDAs were greater for  
8 construction workers than for non-construction  
9 workers, and that the average for the positive  
10 results was greater for non-construction  
11 workers than for construction workers. I can  
12 quote it, but that's the spirit of the  
13 statement that's in the ER.

14 And we also tried to see whether  
15 the database allowed us to confirm or verify  
16 or revise the conclusions that we made from  
17 the plutonium analysis in the TIB-0075 review.

18 This database was a lot smaller than the  
19 early databases, and I don't know if everybody  
20 has it open, but there's --

21 In figure 1 on page six, it shows

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1 a little bar chart. So basically our idea was <sup>216</sup>  
2 can we derive some conclusion from this about  
3 construction workers versus non-construction  
4 workers. And Harry did a statistical analysis  
5 of this data bank, and in the 1950's, there no  
6 construction worker data at all.

7 In the, as you can see in figure  
8 1, in that data bank. They can't say anything  
9 about the 1950's, about the relative exposure.  
10 1960's, there's just a few data points.  
11 1970's also not many. The only decade for  
12 which there was a significant amount of data  
13 we could actually do a comparison was the  
14 1980's.

15 So Harry ran an analysis and found  
16 that probably the conclusions for the 1980's  
17 in the ER were correct. Now it wasn't  
18 possible for us to compare this particular  
19 database for the 1980's with our earlier  
20 analysis, because we don't have any job type  
21 or area data.

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1                   So we weren't able to do any area<sup>217</sup>  
2                   and job types, because an earlier analysis was  
3                   all keyed to are specific types of  
4                   construction workers, is there some indication  
5                   that some types of construction workers or  
6                   construction workers in some areas had higher  
7                   exposure potential some of the time than non-  
8                   construction workers, on average?

9                   And we weren't able to analyze,  
10                  given we had no information on job type, and  
11                  area of work in this particular data. Then we  
12                  looked at the number of positive results, and  
13                  again, it's not possible to say anything  
14                  except for the 1980's, and even then for the  
15                  number of positive samples for construction  
16                  workers are very, very few.

17                  There were 131 bioassays above the  
18                  reporting level for non-construction workers,  
19                  but out of that, 104 positive bioassays were  
20                  for only three workers. So you know, what you  
21                  can say from this database, in comparison to

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1 the other -- 218

2 So we verified that factually, so  
3 far as the statement goes in the ER is  
4 correct. We don't have an issue with that.  
5 But what you can say from this database, in  
6 terms of ability to do a coworker model using  
7 non-construction worker data -- we at least  
8 could not go beyond what we did before in our  
9 analysis from the larger database that we  
10 looked at before.

11 The second thing is that the  
12 earlier analysis showed that on radionuclides,  
13 there are particular exposure patterns, and  
14 you cannot extrapolate from plutonium  
15 generally, which the ER did. It said, you  
16 know, these are the characteristics of  
17 plutonium.

18 So we're comfortable that we can  
19 use non-construction worker data for making --  
20 for construction workers, for other  
21 radionuclides as well. I mean that's sort of

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1 the underlying premise. We didn't find that  
2 underlying premise was justified.

3 DR. TAULBEE: Could you repeat  
4 that last point there?

5 DR. MAKHIJANI: Let me just -- it  
6 might be helpful if I just read what's in the  
7 ER. Okay. OTIB-0052 indicated that  
8 construction trade workers had more plutonium  
9 bioassay measurements below the reporting  
10 limit compared to non-construction workers,  
11 and OTIB-0052 also found that for positive  
12 bioassay, the non-construction worker results  
13 were generally higher than construction trade  
14 workers.

15 Now this, that statement, together  
16 with the analysis in TIB-0075, are the  
17 justifications for using non-construction  
18 worker data to make the coworker model for  
19 construction workers, as being claimant-  
20 favorable.

21 So as I read the Evaluation

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1 Report, or as we, our team, read the  
2 Evaluation Report, that's the basis for using  
3 non-construction worker data. Now the TIB-  
4 0075 thing, we already analyzed and we'll  
5 discuss it further. But in that, we found --  
6 we looked at various radionuclides in TIB-0075  
7 and TIB-0075 does that.

8 But we didn't agree with that  
9 general proposition, that in non-construction  
10 worker data, exposure potential appears  
11 uniformly or generally bigger for all  
12 radionuclides, because it varies by  
13 radionuclides.

14 DR. NETON: Well, I got a little  
15 concerned here, Arjun. We went through  
16 embedded TIB-0052 through the entire  
17 Procedures Working Group. As far as I  
18 remember, almost all issues are closed. So we  
19 have come to agreement on that document. It  
20 sounds to me like you're saying that that's no  
21 longer the case.

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1 DR. MAKHIJANI: Well, we didn't<sup>221</sup>  
2 review it in the context of an SEC and we're  
3 not disagreeing with the statement that it's  
4 in TIB-0052.

5 DR. NETON: SEC or not, it was for  
6 dose reconstruction purposes. I don't  
7 understand why that makes a difference. So if  
8 SC&A is going to change their opinion on TIB-  
9 0052, I hope you go back and rescind it and  
10 re-review the document, because we've got a  
11 closed document that says we can do dose  
12 reconstructions for these nuclides using these  
13 approaches and it's closed.

14 So I have a great inconsistency  
15 concern going here right now, and if you're  
16 changing your opinion --

17 CHAIRMAN GRIFFON: We closed that  
18 out? Are you sure?

19 DR. NETON: Well, it's virtually  
20 closed.

21 (Simultaneous speaking.)

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1 MR. MARSCHKE: There's a few that  
2 I think are still open.

3 DR. NETON: But nothing like what  
4 we're talking about here.

5 DR. MAKHIJANI: I do not believe  
6 we addressed -- I'm not disagreeing with the  
7 statement factually about what's in the  
8 plutonium database.

9 MR. MARSCHKE: I also think that  
10 OTIB-0052, basically the analysis that was  
11 done, avoided using the SRS internal  
12 information in your analysis, because of the -  
13 -

14 DR. MAKHIJANI: We'll have to  
15 bring it up.

16 MR. MARSCHKE: Huh?

17 DR. MAKHIJANI: We'll have to  
18 bring it up. You know it as well.

19 MR. MARSCHKE: Because there  
20 wasn't a lot of -- it wasn't available, I  
21 guess, electronically I guess. For some

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1 reason, the internal analysis of OTIB-0052 ~~was~~<sup>223</sup>  
2 based upon, I think it was Rocky and Hanford.

3 But I don't think it was -- and maybe Idaho.

4 But I don't think it was Savannah  
5 River Site just had this one figure, which  
6 basically the recurring two in the Evaluation  
7 Report, which showed these data that was  
8 selected on hold, just to support the OTIB-  
9 0052 analysis.

10 DR. NETON: Well, but again, the  
11 contention is thoroughly indicated in that  
12 report that these were felt to be  
13 representative of the sites that were  
14 evaluated, and we've received no comments from  
15 SC&A saying that this was not an appropriate  
16 approach.

17 I'm not saying right or wrong.  
18 I'm just saying right now, we've got a big  
19 internal inconsistency issue with the SC&A  
20 review process. That's my opinion.

21 DR. MAKHIJANI: Okay.

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1 DR. NETON: And if you're going to<sup>224</sup>  
2 rescind your review and go back and bring TIB-  
3 0052 back on the table, then that's where we  
4 should take it up, because we've been behaving  
5 as if that approach has been vetted and is  
6 appropriate for use in dose reconstruction.  
7 If it's not, then --

8 DR. MAKHIJANI: I agree we should  
9 go back and look at it. But I think in this  
10 particular context, there's a specific issue  
11 relating to the SRS/SEC evaluation, that  
12 statements in the Evaluation Report that I  
13 think shouldn't be held up.

14 I mean it's entirely up to the  
15 Working Group. I think that we can proceed,  
16 based on the data that are before us for SRS,  
17 and without prejudicing whether we go back and  
18 take a look, because as you say, I don't  
19 remember what all we said in the OTIB-0052  
20 review.

21 CHAIRMAN GRIFFON: Neither do I.

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1 That's why I'm not -- 225

2 (Simultaneous speaking.)

3 DR. NETON: Well, I guarantee lots  
4 of these issues that we're discussing now were  
5 brought up.

6 DR. TAULBEE: I think Jim's got a  
7 valid point. If you're critiquing what we  
8 wrote in the SEC, you know, where we're  
9 relying on the two as being a valid method in  
10 using the coworker to transfer to the  
11 construction trades worker. Because under our  
12 understanding, that one is effectively closed  
13 out. There isn't an issue with this. So this  
14 is an appropriate method.

15 DR. NETON: And I'm not suggesting  
16 the comments you raise here aren't legitimate.

17 I'm just saying that we've been through this  
18 before, and now these are new surface issues  
19 and we've got to go back for consistency  
20 purposes.

21 CHAIRMAN GRIFFON: I know. Yes, I

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1 agree.

226

2 (Simultaneous speaking.)

3 DR. MAKHIJANI: If it is closed,  
4 we definitely and we're raising it again,  
5 there will be a consistency issue.

6 DR. NETON: I mean the only issues  
7 left to deal with there are things like  
8 multipliers for pipefitters and I think --

9 DR. MAKHIJANI: That was external.

10 DR. NETON: Yes. But I'm just  
11 saying, I don't recall that there were any big  
12 internal dose issues remaining on TIB-0052.  
13 In fact, we vetted that thing twice. We  
14 thought we had it closed, then reopened it,  
15 and then it became closed again. This will be  
16 the third time we're opening it.

17 DR. TAULBEE: And also just to  
18 mention, there is Savannah River Site in OTIB-  
19 0052, and specifically polonium.

20 MR. MARSCHKE: But it was  
21 physically -- it was handled as a -- I don't

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1 think it factored into the final conclusion<sup>227</sup>  
2 that the multiplier for internal dose was one.

3 It was just this one figure that showed --  
4 well, it showed exactly what it says in the  
5 ER, that the plutonium bioassay measurements  
6 were reported, were below the reporting limit,  
7 compared to non-construction workers.

8 DR. CHEW: Steve. I'm leafing  
9 through this and I respect what you're saying.

10 OTIB-0052 clearly demonstrated that  
11 construction workers throughout the years had  
12 lower bioassay results from non-construction  
13 workers.

14 So therefore, remember what TIB-  
15 0052 is trying to say, can you go ahead and do  
16 -- is there a correction factor? Do we need  
17 it for a construction worker? The conclusion  
18 based on the data was shown that the answer is  
19 no, zero. So no, and that was discussed. So  
20 I agree with Jim. I think that's not an issue  
21 on the table anymore, right Jim?

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1 DR. NETON: Well, I'm just saying  
2 for consistency purposes, if we're going to  
3 treat Savannah River differently now than what  
4 -- as it raised in TIB-0052, then we ought to  
5 go back and revisit TIB-0052.

6 DR. MAKHIJANI: Well, I think we  
7 clearly need to look at what we said about --  
8 in our TIB-0052 review. I don't have any  
9 question about that. I have our review in  
10 front of me. But --

11 DR. CHEW: Can I comment? TIB-  
12 0075 is still on the table. We have seen your  
13 assessment of the issues on OTIB-0075, but we  
14 have not responded back to that. Yes, and  
15 that -- so we cannot say that what your  
16 assertions in OTIB-0075 is still correct until  
17 we get a chance to review it.

18 DR. MAKHIJANI: Oh no absolutely,  
19 and we decided we're going to discuss that.

20 DR. CHEW: Right.

21 DR. MAKHIJANI: And it's not a

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1 right or wrong, you know. It's a question of<sup>229</sup>  
2 resolving the issues and coming to some mutual  
3 understanding about it.

4 The point I want to make is  
5 whatever -- I know that we did not look, we  
6 did not parse the plutonium data by job type,  
7 in looking at OTIB-0052, and we did that when  
8 we looked at the claimant database, the NOCTS  
9 database that NIOSH created for the purpose of  
10 making coworker models when that data was  
11 available to us.

12 Now for the first time, we had  
13 data that had job types and that had areas of  
14 work and periods, and when we had that data,  
15 we actually analyzed it, and right or wrong,  
16 whatever the resolution is, we made an  
17 analysis of that issue.

18 From the earlier database, that  
19 analysis wasn't possible. It's still not  
20 possible because that earlier database doesn't  
21 contain that information.

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1                   MR. MARSCHKE: Can I read from the ~~the~~<sup>230</sup>  
2 Procedures database? We got finding number 5  
3 for OTIB-0052. Plutonium and/or uranium were  
4 used to compare internal construction trade  
5 workers and all monitored worker doses. What  
6 about other radionuclides? Then that's the  
7 SC&A finding.

8                   Then NIOSH's initial response, the  
9 underlying assumptions for internal dose  
10 comparisons is that the internal dose hazards  
11 for a study is closely tied to the  
12 radionuclides being handled in greatest  
13 quantity at the site. The vast majority of  
14 bioassay data at the DOE complex is for  
15 plutonium and uranium. Data on other  
16 radionuclides is limited in the time frame and  
17 number of results.

18                   Consequently,                   meaningful  
19 comparisons between groups for less prominent  
20 radionuclides were not judged to be feasible.  
21 The status of this finding at this particular

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1 point in time is in progress. 231

2 DR. NETON: At what point in time?

3 MR. MARSCHKE: Today.

4 CHAIRMAN GRIFFON: Today.

5 DR. NETON: That's for other  
6 nuclides. What about plutonium at Savannah  
7 River?

8 MR. MARSCHKE: Again, if you look  
9 at the Savannah --

10 (Simultaneous speaking.)

11 DR. NETON: The gold standard is  
12 based on job category, which is what we didn't  
13 do. If that's the gold standard, then we've  
14 got to go back and revisit 52 against all  
15 those parsings by job categories. I'm  
16 serious.

17 Right now, we find your approach  
18 to be inconsistent with the analysis that was  
19 done on TIB-0052. If SC&A's opinion now is  
20 that the only valid comparison of coworker  
21 data is by job category, then we've got to

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1 judge TIB-0052 against that. 232

2 MR. MARSCHKE: We do that in OTIB-  
3 0052. We looked at job categories. It's for  
4 both internal and -- for both -- and the  
5 finding was we had to change OTIB-0020 to give  
6 basically a warning that, you know, there are  
7 some construction workers who, you know, the  
8 OTIB-0020 standard methodology may not be  
9 favorable.

10 DR. NETON: And the finding for  
11 internal was?

12 MR. MARSCHKE: And the finding for  
13 internalized, you've got me on that. I can't  
14 remember that one.

15 DR. CHEW: That's what we're  
16 talking about.

17 DR. NETON: That's what I'm  
18 talking about. And so again, we have --  
19 you're changing, you're obviously mode of  
20 operation here, so I just want to be  
21 consistent and go back and --

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1 (Simultaneous speaking.) 233

2 CHAIRMAN GRIFFON: I mean that's a  
3 little heavy. Think of the overall process  
4 from the Board's standpoint too. We've always  
5 said that the procedures review is at one  
6 level, and an SEC review is at -- there's this  
7 need to drill down.

8 We've always been stopped on  
9 procedures reviews when we -- because you're  
10 not talking about getting into the individual  
11 site data and pulling the records. A lot of  
12 times they're not, you know. We've always  
13 stopped it there.

14 The procedures review is at a  
15 different level, to see if these things are  
16 going to work and they're science, yes. I  
17 know. I know SC&A's outlined procedure for  
18 how they conduct their procedures review.

19 DR. NETON: Again, but I still say  
20 that this does have ramifications for --

21 CHAIRMAN GRIFFON: No, I agree.

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1 We would have to go back, and I don't want 234

2 (Simultaneous speaking.)

3 DR. NETON: There are  
4 inconsistencies here now.

5 DR. MAKHIJANI: Well, there are  
6 two issues, just to kind of summarize my  
7 understanding, I'm going to have to take it  
8 back to our team, is so far as other  
9 radionuclides are concerned, extrapolation of  
10 plutonium and other radionuclides remains an  
11 open issue in TIB-0052. It remains an open  
12 issue here.

13 I think that's simply a conclusion  
14 from our review of this plutonium database and  
15 our earlier analysis. I agree with Jim that  
16 we need to go, however you want to  
17 characterize it, we need to go back and review  
18 what we said about plutonium and SRS, and its  
19 implications for SRS on other sites.

20 At that time we did not have data  
21 by area, or even plutonium data. Internal

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1 data we did not even have by craft. We only<sup>239</sup>  
2 had external data by craft. So we're able to  
3 do that now.

4 We might have to revisit the  
5 earlier conclusions, since we have more  
6 information. I mean that's how I would  
7 characterize it.

8 DR. NETON: There's more  
9 subtleties involved in this, though, because I  
10 recall in those data sets we were unable to  
11 tease out certain classes of workers. I think  
12 one data set had the crafts construction built  
13 in, and then we went through these lengthy  
14 explanations of why that was claimant  
15 favorable.

16 I'd like to go back and revisit  
17 this approach, because we worked hard. I felt  
18 that we had a fairly good, solid understanding  
19 that at least for the sites that we looked at,  
20 that we were in agreement that construction  
21 workers for internal were not different,

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1 wrap this up, as to -- because you know, <sup>it</sup>~~it~~<sub>237</sub>  
2 was so long ago.

3 DR. NETON: And I'm not saying  
4 that you shouldn't go back and drill down and  
5 look at these new sets of data. What I'm  
6 saying is that was what was done in 52.

7 DR. MAKHIJANI: Right, and  
8 probably you are right.

9 DR. NETON: It needs to be visited  
10 at 52 level again, and maybe that's a separate  
11 issue. It needs to go back to the Procedures  
12 Group. But you know, I'm uncomfortable --

13 CHAIRMAN GRIFFON: This is the  
14 difficulty we had on TIB-0052, especially in  
15 the Procedure Review Committee, that it does  
16 cover several sites. Because if you recall in  
17 the procedures, a lot of times what we're  
18 doing with the site-specific procedures is  
19 we're referring them back to Work Groups that  
20 are covering that site.

21 So in this instance, it's like

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1 where do you, you know, where you do put it?  
2 I guess you have to leave it in Procedures,  
3 and then I don't think we have, at least my  
4 experience with it is that we haven't dealt  
5 with the drilling down to the data aspects  
6 this far.

7 Now but we have to be consistent  
8 at the end of the day, yes.

9 DR. TAULBEE: Can I ask a  
10 question, and this I guess, is more for my  
11 education. But I'd like to know a little more  
12 from SC&A or you, Mark, of why you don't feel  
13 that we can extrapolate from the plutonium to  
14 some of these other radionuclides, such as  
15 curium and californium and americium?

16 They're all controlled, especially  
17 as op emitters, inside glove boxes or hot  
18 cells. And so I'm a little confused as to why  
19 this extrapolation is -- I guess I'd like to  
20 know what your basis for why we can't  
21 extrapolate?

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1 DR. MAKHIJANI: Well in our review<sup>239</sup>  
2 of TIB-0075 -- I don't know Mark.

3 CHAIRMAN GRIFFON: Go ahead, go  
4 ahead.

5 DR. MAKHIJANI: In our review of  
6 TIB-0075, we had not covered americium,  
7 californium and curium, and we were actually  
8 doing that when we realized that you've got a  
9 bigger database than what we're working with  
10 and we stopped that. So we have not finished  
11 those --

12 But to the extent that we did  
13 radionuclides, uranium, plutonium, tritium,  
14 mixed fission products, I think that was the  
15 list, right, that we analyzed, we found that  
16 the patterns of ratios of construction worker  
17 doses in specific areas or specific job types  
18 to non-construction worker averages or GSDs,  
19 were different for different radionuclides.

20 That the patterns of exposure were  
21 not the same, and that's the basis for the

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1 statement. 240

2 DR. TAULBEE: Oh, okay. I can  
3 perfectly understand that when you're  
4 comparing tritium and uranium and plutonium,  
5 and the mixed fission products. But when  
6 you're -- I mean the exotics that you're  
7 effectively talking about here, where we have  
8 very limited bioassay on, are things like the  
9 curium, the americium and so forth. Those are  
10 --

11 DR. MAKHIJANI: Well, we're  
12 talking generally about all extrapolating from  
13 a plutonium statement to other radionuclides,  
14 including americium.

15 DR. TAULBEE: But we have  
16 sufficient data so that we're not  
17 extrapolating the tritium. We're not  
18 extrapolating the uranium. We're not  
19 extrapolating with --

20 DR. MAKHIJANI: You are. What  
21 you're extrapolating is not numbers, but

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1 you're extrapolating a hypothesis. You're<sup>241</sup>  
2 saying here -- you're making a hypothesis.

3 You're saying here is a  
4 characteristic of plutonium data, and we can  
5 accept that, you know, whatever the words are.

6 We can accept that that statement is correct  
7 for the plutonium data.

8 You're assuming that the same  
9 statement is also correct for other  
10 radionuclides. And you'll find that the  
11 number of below MDAs generally would be greater  
12 for construction workers than non-construction  
13 workers, that the average of positive results  
14 would be greater for non-construction workers  
15 than for construction workers.

16 And what we're saying is that  
17 general construct cannot be extrapolated from  
18 plutonium to other radionuclides, because it  
19 doesn't appear to hold up.

20 DR. TAULBEE: I guess at this time  
21 I'll just agree to disagree with you on that,

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1 until we get this TIB-0075 thing worked out<sup>242</sup>

2 DR. MAKHIJANI: Yes, right.

3 DR. TAULBEE: Because from what  
4 we've seen from the tritium is it does hold.

5 DR. MAKHIJANI: Okay.

6 CHAIRMAN GRIFFON: Right. So you  
7 disagree there, but that's a good  
8 clarification on the hypothesis, though. It's  
9 not extrapolating.

10 DR. TAULBEE: Okay. I do  
11 understand now --

12 (Simultaneous speaking.)

13 CHAIRMAN GRIFFON: -- modeling.  
14 It's extrapolating the concept or the  
15 conclusion, yes.

16 DR. MAKHIJANI: I think this  
17 confusion would be sorted out when we look at  
18 the review. You know, we should be able to  
19 agree on the -- so long as we're not saying  
20 the data are all bad or somebody screwed up  
21 with the measurements or something. That's

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1 not on the table. 243

2 We have a discrete set of numbers.

3 We all know numbers. We should be able to  
4 arrive at some conclusion looking at the set  
5 of numbers.

6 DR. NETON: Let me ask a more  
7 broad-based question. Are you leading  
8 eventually to the suggestion that construction  
9 workers can't be reconstructed, or that  
10 there's a different possible multiplier that  
11 would be applied and will be proposed for TIB-  
12 0052?

13 DR. MAKHIJANI: We haven't --

14 DR. NETON: Well, I'm trying to  
15 get down to it. Is it a dose reconstruction  
16 issue or --

17 DR. MAKHIJANI: Don't know.

18 DR. NETON: See, I mean if you're  
19 just -- if you're saying that you have enough  
20 data to do the comparison to show that they're  
21 different, it sort of implies to me that one

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1 can reconstruct doses for construction<sup>244</sup>  
2 workers.

3 DR. MAKHIJANI: Well, is it --  
4 yes.

5 DR. NETON: Is that true? If you  
6 have enough data to make that comparison then  
7 --

8 DR. MAKHIJANI: Well, that's where  
9 we might wind up. I think --

10 DR. NETON: Well, that's what I  
11 put on the table though, because how far we  
12 take this, to put the SEC issues to bed, is  
13 dependent upon where that ratio is.

14 DR. MAKHIJANI: Well, it will  
15 depend on how reliable these issues are, and  
16 some of these ratios --

17 DR. NETON: Be careful.

18 DR. MAKHIJANI: No, no. I am  
19 being careful. I don't have an opinion about  
20 this honestly. That's why I believe we wrote  
21 that TIB-0075 review without even implying,

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1 and Steve and I worked on this together, and I<sup>245</sup>  
2 think we did not imply an opinion on this  
3 question, as to whether ultimately you'll be  
4 able to attach a ratio.

5 It's obviously a question that's  
6 occurred to me in the course of preparing this  
7 review. And I've tried to avoid giving any  
8 implication one way or another, because I  
9 honestly don't know.

10 The reason I don't know is, A, for  
11 a lot of cases, we just couldn't even do the  
12 calculation. There just aren't enough data  
13 there. You see no calculation, no  
14 calculation, no calculation, no calculation.

15 In some of the cases where we did  
16 the calculation, the data were minimal, 10, 12  
17 construction workers. The non-construction  
18 worker data are much more plentiful. So I  
19 think the reliability -- so what we've --

20 CHAIRMAN GRIFFON: I think Jim  
21 posed a good question.

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1 DR. MAKHIJANI: It is a very good  
2 question.

3 CHAIRMAN GRIFFON: Do you have  
4 enough data to do the comparison? Do you have  
5 enough data to make a separate construction  
6 worker model?

7 DR. MAKHIJANI: That's right, and  
8 the reason -- I'm just saying the reason that  
9 I don't have an opinion about this is if we're  
10 going to look at more data, Jim may very well  
11 be right, that if there's sufficient data that  
12 we can actually do these ratios, come up with  
13 the ratios for areas and periods and so on,  
14 then it won't be an SEC issue. But if we  
15 can't, or if there isn't enough data, then  
16 it's an SEC issue.

17 CHAIRMAN GRIFFON: And I guess --

18 DR. TAULBEE: There isn't enough  
19 data.

20 DR. CHEW: Not enough data to  
21 become an SEC issue? What are saying?

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1 CHAIRMAN GRIFFON: Yes. 247

2 DR. NETON: I'd have to think  
3 about this. If there's not enough data to  
4 prove --

5 (Simultaneous speaking.)

6 DR. NETON: You know, -- are  
7 different. If you don't have enough data to  
8 prove that they're not different, I mean that  
9 doesn't imply automatically that they are, and  
10 you can't do it. I mean there's a certain  
11 logical connection there --

12 CHAIRMAN GRIFFON: Yes. From  
13 NIOSH's standpoint, I think you created this  
14 model, not necessarily because you didn't  
15 think there was enough construction worker  
16 data, but rather because you thought that  
17 using it altogether would be more bounding,  
18 you know, right. Is that fair?

19 DR. NETON: That would be fine.  
20 That's a fair comparison.

21 DR. MAKHIJANI: And so the point

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1 of putting that analysis on the table is not <sup>248</sup>  
2 to say there's an SEC here or not an SEC here.

3 It is simply to say that the construct that  
4 NIOSH -- that we don't agree with the  
5 construct that NIOSH said, that you can use  
6 all the data to make coworker models. We  
7 don't think so.

8 CHAIRMAN GRIFFON: But I think  
9 that question is important to Jim, right? I  
10 think SC&A should answer that question, you  
11 know. Is there enough data to create a  
12 separate construction worker model? And would  
13 it be appropriate, in your opinion.

14 DR. MAKHIJANI: We can answer that  
15 question, and we haven't yet.

16 DR. NETON: But in the SEC  
17 context, that's what needs to be --

18 CHAIRMAN GRIFFON: Yes, because  
19 otherwise, then that's a -- and we can kind of  
20 get it off the SEC schedule.

21 DR. NETON: Right, because we've

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1 got a lot of things on the table. 249

2 CHAIRMAN GRIFFON: Yes, I agree  
3 with that. I agree with that.

4 DR. MAKHIJANI: Maybe the main  
5 task to be done is once this database is  
6 completed and NIOSH says this is the database  
7 that we're going to use and the radionuclides  
8 are there, then we can.

9 CHAIRMAN GRIFFON: That's true.  
10 We don't have a fully populated database.

11 DR. NETON: We don't.

12 (Simultaneous speaking.)

13 DR. MAKHIJANI: -- we were going  
14 to be here further along, but about a month  
15 ago, we just suspended work, because we  
16 realized we're not working from a complete  
17 database.

18 CHAIRMAN GRIFFON: Yes. Tim, do  
19 you have a comment? It seems like you wanted  
20 to say something. No?

21 MEMBER CLAWSON: I wanted to say

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1 something though, because I mentioned this<sup>250</sup>  
2 before, and especially during a construction.

3 I have not been able to see the OTIB and see  
4 how it placed in. But one thing I do want you  
5 to realize is Savannah River is completely  
6 different than any of the other sites when it  
7 comes to construction workers.

8 Because in the interviews and  
9 everything else like that, what they were  
10 telling me the processes they were involved in  
11 and stuff like that is totally different than  
12 the normal site that we usually see.

13 I cannot answer to this, because I  
14 haven't read how the OTIB comes in or anything  
15 else, but this is always been something that's  
16 bothered me, is how different this site and  
17 how we can't -- to me, we can't generalize it  
18 as some of the other sites.

19 I've said this for quite a while,  
20 and we were waiting for this OTIB to come out  
21 and we'll go from there.

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1 CHAIRMAN GRIFFON: Let me ask for  
2 a 15 minute break.

3 MR. KATZ: Can we just clarify?

4 CHAIRMAN GRIFFON: Go ahead.

5 MR. KATZ: It's still slightly  
6 unclear to me --

7 CHAIRMAN GRIFFON: It's very  
8 unclear.

9 (Simultaneous speaking.)

10 CHAIRMAN GRIFFON: -- because I  
11 want to caucus with Arjun and Jim a little  
12 bit. So let's take 15 minutes, because I want  
13 to sort this out a little bit and come back  
14 and clarify the actions and stuff, yes, right.  
15 So 15 minutes, about -- what's that, 2:35  
16 about?

17 MR. KATZ: Yes.

18 (Whereupon, the above-entitled  
19 matter went off the record at 2:20 p.m. and  
20 resumed at 2:34 p.m.)

21 MR. KATZ: This is the Savannah

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1 River Site Work Group. We're reconvening, <sup>292</sup>

2 Let me just add too, after the lunch break, I  
3 didn't hear from Dr. Lockey. Are you with us?

4 (No response.)

5 MR. KATZ: Okay, Mike, do we still  
6 have you?

7 MEMBER GIBSON: Yes, I'm still  
8 here Ted.

9 MR. KATZ: Great, Mike.

10 CHAIRMAN GRIFFON: Okay. We're  
11 continuing on issue number 13, and I think  
12 there's one other item and then we'll go  
13 through sort of the actions. But one other  
14 item that I was looking at over break, from  
15 the last meeting we said that the log books,  
16 the comparison of the log books and the  
17 database, and I think this might come up in a  
18 later issue too.

19 There's some overlap in these  
20 issues. But it was definitely listed in this,  
21 and NIOSH posted, I think, a spreadsheet and

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1 log books. Then SC&A was tasked to review<sup>253</sup>  
2 those, comparing to the database, or at least  
3 to review NIOSH's analysis. I think Arjun  
4 indicated he's started that process and they  
5 have some questions. So maybe we can just  
6 discuss that for a little bit.

7 DR. MAKHIJANI: Yes. You know Bob  
8 Barton is unfortunately at Simonds, and he's  
9 our guy on this. And so I'll just kind of  
10 mention the difficulty we ran into, and if I  
11 might request that we have a technical call  
12 about this, because I want Bob Barton to be  
13 here.

14 CHAIRMAN GRIFFON: I don't know  
15 think it's a technical, I think --

16 DR. MAKHIJANI: I think we just  
17 need some clarifications for what NIOSH did,  
18 because the verifications were from the log  
19 books and it said yeses and nos, and we  
20 couldn't figure out what the yeses and nos  
21 meant. What was being verified?

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1 DR. TAULBEE: Okay. This is the <sup>254</sup>  
2 comparison between the NOCTS and the SRD, or  
3 the NOCTS and what's in the log books. From  
4 what my understanding, and Mike, please jump  
5 in here if I'm speaking incorrectly, is that  
6 we went through and just picked 200 log book  
7 entries, okay, from the log books. That's  
8 where we started.

9 From those, we identified that, of  
10 these entries, 62 of them were claimants in  
11 the -- for which we should have bioassay data  
12 for them from the site. So from these we went  
13 through and compared those particular results.

14 DR. MAKHIJANI: Which results?

15 DR. TAULBEE: The log book results  
16 to what we have on the bioassay card that we  
17 received from the site for that individual.

18 DR. MAKHIJANI: So the actual  
19 result for the bioassay in the individual's  
20 file with --

21 DR. TAULBEE: Yes, that's correct.

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1        So from that table that we sent you in that <sup>255</sup>  
2        spreadsheet, wherever yes is there was a  
3        direct match between what was the entry in the  
4        log book and what was entered onto the  
5        bioassay card, okay.

6                    So from that grouping of 62  
7        claims, three claims contained no data  
8        corresponding to the log book entries. So  
9        that's less than five percent, 57 claims --

10                   DR. MAKHIJANI:        Three claims  
11        contained.        That didn't register under  
12        percentage. Three claims contained --

13                   DR. TAULBEE:        Three claims  
14        contained no data corresponding to the log  
15        book.

16                   MR. MAHATHY:    In other words --

17                   DR. MAKHIJANI:    Yes, I got that.  
18        No correspondence. Sorry.

19                   DR. TAULBEE:    And I -- now we've  
20        got a numbers problem here Mike, because then  
21        we say 57 claims had corresponding data. So

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1 57 of the 62 claims had corresponding data<sup>256</sup>  
2 Now some people had multiple entries in this  
3 whole thing.

4 So it wasn't -- when you look at  
5 the actual spreadsheet that we gave you, what  
6 you'll see is the NOCTS claim ID and just  
7 going down through here, you'll see midway  
8 through on that table, Claim 1756 has two  
9 entries.

10 MR. MAHATHY: The 57 should be 59.

11 DR. TAULBEE: I'm sorry? 57  
12 should be 59 in my write-up. This is why this  
13 is a draft write-up and we haven't released it  
14 yet. Okay. That's it. So 59, I'm sorry, of  
15 the 62 claims, we have corresponding data.

16 DR. MAKHIJANI: Okay.

17 DR. TAULBEE: The third column is  
18 construction trades workers, okay. This is  
19 from -- we further subdivided the group, and  
20 this gets into a little bit of what Brad was  
21 talking about, where we're using the self-

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1 identified construction trades workers, based<sup>257</sup>  
2 upon -- from NOCTS basically, where somebody  
3 says they were a pipefitter or a carpenter.

4           Whether they were Roll 4 or not,  
5 Roll 4 is the traditional construction trades  
6 workers at Savannah River Site, and these are  
7 additional people that Brad was indicating  
8 construction, you know, some people that other  
9 sites would consider construction trades,  
10 Savannah River considered them as operations,  
11 maintenance type of people.

12           CHAIRMAN GRIFFON: And they were  
13 with DuPont?

14           DR. TAULBEE: That's correct. So  
15 the CTW column there is including those people  
16 as well. And so from this, what you'll see is  
17 that over 92 percent, we were getting direct  
18 match from what we see in the files, and what  
19 we see in the log books.

20           DR. MAKHIJANI: Now I think one of  
21 the questions we had was the 62 claimants.

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1 Did you look at all their bioassay data, or  
2 just the entries that corresponded to --

3 MR. MAHATHY: Just the entries  
4 from the log book.

5 DR. MAKHIJANI: Okay. So there  
6 were 62 entries -- so far 62 claimants, there  
7 were 62 entries in the log books, and there  
8 were 59 matches and three non-matches.

9 MR. MAHATHY: Well, we used 200  
10 log books. Some of people in the logs were  
11 used multiple times. In other words, the  
12 person selected 200 entries from these three  
13 log books or two log books.

14 DR. TAULBEE: There's not 200  
15 entries here. It's just some people had  
16 multiple entries. So I think in total you  
17 come up with 70-something or something like  
18 that entries.

19 DR. MAKHIJANI: Okay, so you  
20 compare.

21 DR. TAULBEE: We did not go

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1 through it, to answer your question Arjun, ~~we~~<sup>259</sup>  
2 did not go through at least 62 people and look  
3 at all of the bioassay and pull all the other  
4 log books.

5 No. We just took these three  
6 different log books, I think it's three, three  
7 different log books, and we looked at those  
8 entries and from the point of data, are we  
9 seeing a match?

10 (Simultaneous speaking.)

11 DR. MAKHIJANI: Four log books,  
12 right?

13 MR. MAHATHY: Four log books. We  
14 listed, you know, to explain this, we looked  
15 at 200 entries, and only 62 of the  
16 corresponding people were in NOCTS. Of those  
17 62, three of the entries did not match what  
18 was in the log book.

19 DR. MAKHIJANI: I'm getting  
20 confused between entries and people. That's  
21 what I'm getting confused with. So there were

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1 200 bioassay data points for 200 separate  
2 people or less than 200 people. Less than 200  
3 people.

4 DR. TAULBEE: Less than 200  
5 people, because some of them were the same  
6 person.

7 DR. MAKHIJANI: The same person.  
8 The 62 or 62 people or 62 bioassay data  
9 points?

10 DR. TAULBEE: People.

11 DR. MAKHIJANI: People.

12 CHAIRMAN GRIFFON: Those are  
13 people.

14 DR. MAKHIJANI: And you had more  
15 than 62 bioassay data points?

16 CHAIRMAN GRIFFON: I think that  
17 where he got the 70-something, and there were  
18 some with more than one entry.

19 DR. TAULBEE: Some of them had  
20 more one entry, yes.

21 CHAIRMAN GRIFFON: So it was in

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1 the 70s or something, right? 261

2 DR. MAKHIJANI: And when you say  
3 three claims contained no data, so none of the  
4 data points corresponded, and 57 claims had  
5 all of their data points verified.

6 DR. TAULBEE: Fifty-nine.

7 DR. MAKHIJANI: Fifty-nine, sorry.

8 MR. MAHATHY: Okay, and this is --  
9 like I said, this is -- while we haven't  
10 totally released this, although you have it,  
11 it's actually not totaled either, because the  
12 interpretation is three log book bioassays  
13 results were not contained in NOCTS. But the  
14 same people did have other bioassay results  
15 that were in the log books. Three of the log  
16 book reviews will not be in NOCTS.

17 DR. MAKHIJANI: So we're talking  
18 62 bioassay entries, and 59 bioassay entries  
19 were matches and three were not matches?

20 MR. MAHATHY: 62 people, with  
21 about 70 some-odd -- some people had more than

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1 one.

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2 CHAIRMAN GRIFFON: So it was three  
3 out of 70 some-odd, is that right?

4 MR. MAHATHY: It's probably the  
5 correct translation, yes.

6 DR. MAKHIJANI: Now you can see  
7 why we were confused.

8 (Simultaneous speaking.)

9 CHAIRMAN GRIFFON: All right.

10 DR. MAKHIJANI: Okay. At least I  
11 know what we're doing. I might have Bob  
12 Barton call you when he's writing up this  
13 memo. Sorry Steve.

14 MR. MARSCHKE: One of the concerns  
15 was that again, we don't think we have the  
16 complete NOCTS database, and --

17 CHAIRMAN GRIFFON: What do you  
18 mean the NOCTS database?

19 (Simultaneous speaking.)

20 CHAIRMAN GRIFFON: The claims  
21 filed is what you're going to be looking at.

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1 MR. MARSCHKE: Because what <sup>we</sup> <sub>263</sub>  
2 were looking at, what Bob was looking at, and  
3 I could be wrong, but what Bob was looking at  
4 is he has this -- he was comparing it to the  
5 same files that I was using to do the OTIB-  
6 0075 review, and like we spoke this morning,  
7 we don't --

8 CHAIRMAN GRIFFON: You're looking  
9 at the claimant's files.

10 MR. MAHATHY: Yes. We're looking  
11 directly in the files.

12 MR. MARSCHKE: You're looking at  
13 the claimant's files. So when we go and we  
14 try to check, when we try to check your work,  
15 to make sure that these entries were made, I  
16 guess the question is how do we check that?

17 DR. MAKHIJANI: Does your report  
18 have claim numbers?

19 DR. TAULBEE: In this table, you  
20 have the NOCTS claim number, so you can go and  
21 open up that particular claim and look at the

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1 hard copy. 264

2 MR. MARSCHKE: I don't think we  
3 were doing that.

4 DR. MAKHIJANI: I think that's we  
5 should do.

6 MR. MARSCHKE: That's what we need  
7 to do, what we need to do.

8 DR. MAKHIJANI: Yes. I think we  
9 just got stuck in some misunderstanding.

10 MR. MAHATHY: Well, the wording  
11 wasn't exactly --

12 DR. MAKHIJANI: About what was  
13 being done. I think Bob's confusion was the  
14 same as mine, although I don't --

15 CHAIRMAN GRIFFON: But now I think  
16 we've got it straight pretty much now.

17 DR. MAKHIJANI: Yes, I think we  
18 can do it now. So we can finish this on short  
19 order.

20 CHAIRMAN GRIFFON: All right. Can  
21 I ask a question on the -- how did you select

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1 the entries that you looked up? Just random  
2 selection or -- because I mean 383 isn't a  
3 very significant. You don't see any trends  
4 obviously, but I'm always --

5 When I look at these log books, I  
6 always kind of pick out the highest values and  
7 go from there, because if they're missing,  
8 that's more important than anything else  
9 missing, because a lot of this is for coworker  
10 modeling.

11 DR. TAULBEE: This is done under  
12 the original or the first part of the SEC, so  
13 we were really crunched for time, to try and  
14 get this analysis in. So we can certainly  
15 look at more, you know.

16 CHAIRMAN GRIFFON: Oh no. I'm  
17 just curious, how you --

18 DR. TAULBEE: I don't think it was  
19 random. I think it was just -- well,  
20 selecting a few log books was probably random.  
21 We just opened up these and let's take 25

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1 from each one or 50 from each one and then  
2 let's see do we see any claimants in here and  
3 go check their data.

4 So you know at that time, we were  
5 only going to make sure hey, are we seeing  
6 something reasonable here or, you know, are we  
7 only picking up ten percent of the data, you  
8 now, in the files. Since we're in the 90s,  
9 we're like okay.

10 CHAIRMAN GRIFFON: Because you see  
11 where I'm going. Yes, the importance here is  
12 if it's -- if you're only missing five percent  
13 or less, but they're all the high values, then  
14 we have a problem potentially you know. But  
15 if you're missing five and they're all, you  
16 know, it's all over the place, then it's --

17 DR. TAULBEE: I mean there's other  
18 analyses that can be done. Now that we've  
19 coded all the uranium data through 1965 on the  
20 thorium side, you know, that can be directly  
21 compared as to those values and they're both

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1 electronic data sets now, so it's -- but that  
2 would be possibly a reasonable comparison to  
3 do from that standpoint.

4 Of course, it's only checking one  
5 isotope, but the bioassay results are  
6 available.

7 DR. MAKHIJANI: So did you want  
8 NIOSH to work further, or did you want us to  
9 pick --

10 (Simultaneous speaking.)

11 DR. TAULBEE: Yes.

12 DR. MAKHIJANI: --to be clear on  
13 who you're assigning.

14 CHAIRMAN GRIFFON: I think at this  
15 point it has to stay with you until you, you  
16 know --

17 DR. TAULBEE: So we might come  
18 back.

19 DR. MAKHIJANI: So we finish these  
20 four log books, and you want us to stop there,  
21 or do what you just --

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1                   CHAIRMAN GRIFFON: I mean the ~~one~~<sup>268</sup>  
2 question I would ask, just as an action, is  
3 just a description of the methodology that you  
4 did use for your -- if that's already out  
5 there, that's fine. But if it's not, maybe  
6 just so that will help us in looking at this.

7                   DR. MAKHIJANI: So should we  
8 credit these out some high values and  
9 crosswalk them?

10                  CHAIRMAN GRIFFON: I think you  
11 should review the four log books and what  
12 NIOSH did. So if you --

13                  DR. MAKHIJANI: So go further than  
14 those four log books?

15                  CHAIRMAN GRIFFON: Yes, that would  
16 be worthwhile, yes. Because you may be of the  
17 opinion that yes, it's not worth going any  
18 further after that.

19                  DR. MAKHIJANI: Yes.

20                  DR. TAULBEE: So we will get you  
21 the better description of that --

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1 CHAIRMAN GRIFFON: Is that okay  
269  
2 with other Work Group Members though?

3 MEMBER CLAWSON: I'm still trying  
4 to figure out what they would have.

5 CHAIRMAN GRIFFON: I'm just making  
6 sure everybody's --

7 MEMBER GIBSON: That's fine with  
8 me, Mike.

9 CHAIRMAN GRIFFON: Oh, okay. Then  
10 I'm going to also ask Arjun -- I'll give you a  
11 second to catch up.

12 DR. MAKHIJANI: Yes, to catch up.

13 CHAIRMAN GRIFFON: Okay. Now for  
14 the other items, the TIB-0052/TIB-0075  
15 discussion, I had on here that SC&A will  
16 provide an updated response to this, but do  
17 you think that response already is out there  
18 or --

19 DR. MAKHIJANI: Let's see. Which  
20 number are we on?

21 CHAIRMAN GRIFFON: Well, this is

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1 still under 13, that before the break we were<sup>270</sup>  
2 talking about.

3 DR. MAKHIJANI: Yes. We did.  
4 That's what we did. I mean that was the TIB-  
5 0052 review.

6 CHAIRMAN GRIFFON: Okay. So I  
7 thought you were going to -- at some point in  
8 the conversation, I thought you said you were  
9 going to look further at this thing.

10 DR. MAKHIJANI: That was in  
11 response to what Jim was saying.

12 CHAIRMAN GRIFFON: Regarding the  
13 consistency of the procedure, okay.

14 DR. MAKHIJANI: Yes. I don't  
15 think there was --

16 CHAIRMAN GRIFFON: Is there any  
17 other action? No. I mean it's just hanging  
18 there kind of. We didn't come to any  
19 conclusion on it.

20 DR. MAKHIJANI: No, basically, we  
21 punted until NIOSH is done with the database.

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1 Well, there are basically two things, three  
2 things. There's the other radionuclides  
3 question, the classification component, then  
4 going back to TIB-0052 and you know, see what  
5 we said there.

6 And then the third thing is that  
7 we agreed that NIOSH is going to put the more  
8 complete database that you're now constructing  
9 for tritium.

10 DR. TAULBEE: For tritium, yes.  
11 But that's under TIB-0075.

12 DR. MAKHIJANI: And then we're  
13 going to look at our analysis for tritium and  
14 TIB-0075 and your analysis, and try to come to  
15 some resolution, or at least carry the  
16 dialogue further.

17 DR. TAULBEE: Yes. I think once  
18 we post that data set, I think we're going to  
19 try and do a technical call? Guys?

20 DR. MAKHIJANI: Yes, right.

21 DR. TAULBEE: Okay, and that's

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1 going to happen before we post our analysis,  
2 right?

3 DR. MAKHIJANI: Yes, yes.

4 DR. TAULBEE: Okay.

5 DR. MAKHIJANI: I mean we have  
6 some idea of what you've done.

7 CHAIRMAN GRIFFON: All right, and  
8 let me -- this may just be me, but you said  
9 TIB-0052 regarding use of other radionuclides?

10 DR. MAKHIJANI: Well, I think this  
11 is extrapolation to other radionuclides.

12 (Simultaneous speaking.)

13 DR. NETON: I thought we were  
14 going to -- SC&A was going to start  
15 investigating, you know, the SEC implications  
16 of that, I guess. You know, are these SEC --

17 (Simultaneous speaking.)

18 CHAIRMAN GRIFFON: Yes, I do.  
19 That was the other thing I figured out --

20 DR. NETON: I think that's very  
21 important in my opinion. That's sort of the

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1 ultimate litmus test of what we're doing. 273

2 CHAIRMAN GRIFFON: Yes.

3 DR. MAKHIJANI: Now we cannot do  
4 this for all radionuclides unless we have the  
5 data for all radionuclides. So far we've only  
6 talked about tritium, and when I looked at our  
7 -- the database that we were working from,  
8 there are almost no data for like neptunium.  
9 Almost nothing there.

10 As you know, I mean that's what  
11 you found too, because I believe that's why  
12 you're coding more data. So we really  
13 couldn't say anything.

14 CHAIRMAN GRIFFON: Start there at  
15 least.

16 DR. MAKHIJANI: Yes. We can start  
17 with tritium, but ultimately it would have to  
18 go radionuclide by radionuclide, until --  
19 unless there's a general pattern, and then we  
20 can say okay, there's a pattern and you can  
21 settle it with ratios and then you're done.

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1 DR. TAULBEE: Right. Well, what I  
2 think we should be doing is I think we should  
3 start with this tritium to start with, and  
4 come to some agreement on the analysis  
5 methodology for comparison before we move on  
6 to others.

7 Then once we've moved onto others,  
8 plutonium, uranium or whatever was next, then  
9 we can start looking for the whole pattern.  
10 Instead of trying to solve this other  
11 radionuclides all at once here, let's look and  
12 see what these ones where we do have  
13 sufficient data, where we have a tremendous  
14 amount of plutonium data and tritium data and  
15 uranium data, to make these comparisons.

16 DR. MAKHIJANI: Yes, and that's  
17 one issue. But I don't think it's going -- I  
18 think it will be helpful if the data sets that  
19 you're going to use for other radionuclides  
20 are all posted, and we can talk about tritium  
21 in terms of construction workers versus non-

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1 construction workers. But there's clearly<sup>275</sup>  
2 going to be --

3 CHAIRMAN GRIFFON: Are the other  
4 data sets not ready or --

5 DR. TAULBEE: The uranium is  
6 parsed in two phases, which is why I didn't  
7 want to bring it up at this point, only  
8 because we've got all of the data prior to  
9 1965 coded. But then we don't after 1965. We  
10 only went up to '65 for the thorium, okay, at  
11 that point.

12 So you know, that hasn't been  
13 coded. So all the tritium data has been coded  
14 and there's lots of it. So that's why I want  
15 to try and start with the tritium. Then for  
16 the plutonium, if we're seeing a difference  
17 then in the uranium, then we can look at the  
18 data that Mel had collected previously for  
19 OTIB-0052, possibly ways of cutting that.

20 And there's also the possibility  
21 of adding to that database. Again, we have

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1 all of the hard copy records of bioassay from<sup>276</sup>  
2 the site. It's just not all coded, and so if  
3 you're wanting to look at more construction  
4 trades workers from that hard copy, it can be  
5 coded.

6 CHAIRMAN GRIFFON: I guess what I  
7 -- I'm trying to get to Jim's question, which  
8 is, and I think if the data that was used to  
9 make TIB-0075, I mean if -- it's not going to  
10 be anything other than additional data, right?

11 Oh, I got to be careful with that maybe.

12 I was thinking the data set's just  
13 going to grow from there, right? But it would  
14 definitely --

15 DR. TAULBEE: I can certainly give  
16 you more of these exotic radionuclides. But  
17 there's going to be so few samples, I don't  
18 know what kind of meaningful comparisons can  
19 be made.

20 CHAIRMAN GRIFFON: Right.

21 DR. TAULBEE: That's why I think,

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1 you know, sticking to the big three <sup>of</sup><sub>277</sub>  
2 tritium, uranium and plutonium, and if they're  
3 all showing the same --

4 DR. NETON: Well, I understand an  
5 argument can be made though, that these are  
6 different processes.

7 DR. MAKHIJANI: In the past what  
8 has happened with SECs, as you know Jim, is  
9 you have data for the main radionuclide, and  
10 then you don't have data for the radionuclides  
11 that were ancillary or not part of the main  
12 processing.

13 The SECs have been driven not  
14 because the sites weren't paying attention to  
15 the main thing; that would be process. They  
16 were. They were driven by other things. So  
17 in this particular -- since you're asking,  
18 since the Work Group is asking us to kind of  
19 give our opinion about whether you can cover  
20 this by ratios and Site Profile issue, I can -  
21 -

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1                   Just from past experience <sup>in</sup> ~~278~~  
2           looking at the data that we have looked at, I  
3           can tell you that there is not much data for  
4           construction workers for californium or  
5           americium, and these are production items. So  
6           you can't just say a priori that we have  
7           plutonium data and it's --

8                   DR. NETON:    No, I understand.  I  
9           mean there may be good reason why there aren't  
10          a lot of data points, and that would be  
11          incumbent upon us to go and discuss it.

12                  DR. MAKHIJANI:    That's right,  
13          exactly.  But I can't give you an opinion -- I  
14          can't go to my team and go to Joyce and say  
15          give us an opinion about this until we  
16          actually look at the data.

17                  DR. TAULBEE:    And I'd also like to  
18          emphasize, what you're looking at when you say  
19          there's limited data on the californium,  
20          curium and so forth, you're absolutely right.  
21          In NOCTS right now, and I'm not even sure

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1 we've gotten to that coworker model yet, but <sup>279</sup>  
2 if we need to, we will go back and we will  
3 supplement from those log books like we did  
4 the uranium.

5 DR. MAKHIJANI: This is the issue,  
6 is that you know, at a certain point you find  
7 insufficient data, and then you say you've got  
8 more and you code more, then it's --

9 (Simultaneous speaking.)

10 DR. NETON: We need to go back and  
11 look at the uses of those nuclides, and how  
12 often they were used, what the exposure  
13 potentials really were. This is not unlike  
14 what we're trying to do right now, come to  
15 some agreement at Los Alamos.

16 I mean Los Alamos had a number of  
17 minor radionuclides that we called exotics,  
18 and our position is that there just wasn't  
19 much potential for exposure. That's why you  
20 don't have many nuclides and they were  
21 controlled basically at the same levels. We

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1 need to -- I'm really concerned about drilling<sup>289</sup>  
2 down and having to demonstrate that we have  
3 unique distributions for every single isotope,  
4 because you know, earlier we talked about 150  
5 radionuclides. That's not going to happen.

6 CHAIRMAN GRIFFON: I guess I just  
7 wonder if it's useful to, you know, the big  
8 three as Tim talked about, would it be useful  
9 for SC&A to look into the big three and  
10 determine whether there's sufficient data  
11 there for those three to make construction  
12 worker models separate from the overall model,  
13 you know, if there's --

14 DR. NETON: I agree. I mean if it  
15 doesn't work for them, there's no reason to go  
16 after the data.

17 CHAIRMAN GRIFFON: Right, right.  
18 And you know, we're not extrapolating from  
19 there that therefore you can do all the  
20 others. We're just saying look at these three  
21 as a starting point. Do they have the data,

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1        though?     That's what I want to understand,<sup>281</sup>

2        because --

3                    DR. TAULBEE:    In the tritium --

4                    (Simultaneous speaking.)

5                    CHAIRMAN GRIFFON:   The tritium you  
6        will post, right.     What about plutonium,  
7        uranium --

8                    DR. TAULBEE:    The uranium we can  
9        post.    You've got to keep in mind it's only up  
10       to 1965.

11                   CHAIRMAN GRIFFON:   All we really  
12       need is what's posted, what was used for the  
13       TIB-0075, right?

14                   DR. TAULBEE:    Right.

15                   DR.    MAKHIJANI:        And    TIB-0075  
16       Savannah River was only for tritium from 1991  
17       to 2001.   That's extremely limited.   So when  
18       we looked at TIB-0075 for Savannah River Site,  
19       you could hardly say anything.

20                   (Simultaneous speaking.)

21                   DR.    MAKHIJANI:        Something about

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1 that tritium, and we did. We thought it was <sup>282</sup>  
2 okay, if I'm remembering right.

3 DR. TAULBEE: But you know, in the  
4 review of the coworker models, obviously we  
5 don't just look at whatever TIB-0075 is. That  
6 was a methodology demonstrating that a random  
7 sample can be pulled from NOCTS. That was the  
8 purpose.

9 CHAIRMAN GRIFFON: So uranium, you  
10 have up to '65 you're saying?

11 DR. TAULBEE: To '65, yes.

12 CHAIRMAN GRIFFON: And then  
13 plutonium?

14 DR. TAULBEE: Plutonium, we have  
15 the basic NOCTS file, and then for OTIB-0052,  
16 we went down and captured construction trade  
17 workers specifically, doing a sort based upon  
18 external dose, that people who have higher  
19 external doses will have higher potential for  
20 internal plutonium. So based upon that, they  
21 were selected for additional --

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1 (Simultaneous speaking.) 283

2 DR. TAULBEE: How many people did  
3 you get additional for --

4 MEMBER CLAWSON: For construction  
5 workers? About 400-something.

6 DR. TAULBEE: About 400  
7 additional. So we have NOCTS, and then we  
8 have about 400 additional workers. So it's  
9 not a complete data set. It's been modified.  
10 I'm not sure that it's really random now, but  
11 it's what we have electronically.

12 DR. MAKHIJANI: The issue, I think  
13 you know, I mean I am very hesitant to say  
14 that we can say anything. If the database is  
15 not a constant, then it becomes very hard. I  
16 can just tell you, if the database is not a  
17 constant, then it's going to be very hard to  
18 say.

19 Because then every time you have  
20 more data, then you've got to go back, and  
21 that's what's been happening, is we're going

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1 back a second round because the database <sup>is</sup> ~~is~~  
2 expanding.

3 DR. TAULBEE: Can I propose this  
4 then?

5 CHAIRMAN GRIFFON: Yes.

6 DR. TAULBEE: Let's start with the  
7 tritium, and then let's do the analysis of the  
8 uranium through 1965, and then reassess, see  
9 where we're at -- if we get that done before  
10 the next worker meeting --

11 CHAIRMAN GRIFFON: Is the tritium  
12 complete now or --

13 DR. TAULBEE: Yes.

14 CHAIRMAN GRIFFON: Okay. So  
15 that's not going to change?

16 DR. TAULBEE: No, and neither is  
17 the uranium prior to '65.

18 CHAIRMAN GRIFFON: All right. I  
19 agree with that, because we don't want to hit,  
20 we don't want to go at these moving target  
21 possibilities.

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1                   So all right. So we're going to<sup>285</sup>  
2 task SC&A with looking at that, with an eye on  
3 the question of is it an SEC issue or a Site  
4 Profile issue. In other words --

5                   DR. MAKHIJANI: And then we'll  
6 conclude just for that much.

7                   CHAIRMAN GRIFFON: Right. Just  
8 for those pieces, yes. You can qualify your  
9 responses appropriately, yes.

10                  DR. TAULBEE: So we'll post both  
11 the tritium data and the uranium data through  
12 1965.

13                  CHAIRMAN GRIFFON: Yes.

14                  MR. KATZ: So it's basically an  
15 adequacy of the data in terms of --

16                  CHAIRMAN GRIFFON: It's really a  
17 question is the data sufficient to reconstruct  
18 doses, and that can be through a coworker  
19 model or whatever.

20                  MR. KATZ: Right.

21                  CHAIRMAN GRIFFON: Because if it's

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1 a question of like Jim said what is correct, in  
2 NOCTS then we can move that to Site Profile,  
3 yes.

4 MR. KATZ: Fair enough.

5 CHAIRMAN GRIFFON: Okay.

6 MR. MARSCHKE: Yes. I think that  
7 once we get the same data set, we'll see. But  
8 right now, the analysis that we did in this  
9 report here for uranium, we only had a little  
10 -- we had 240 samples. So obviously --

11 CHAIRMAN GRIFFON: Yes, it could  
12 change.

13 MR. MARSCHKE: It could change if  
14 we get a significant more number of samples.  
15 We do have a lot of tritium. We did do a lot  
16 of tritium samples, over 17,000. So this is  
17 for the construction workers. So I would  
18 think that they wouldn't change too much.

19 But whatever you give us now, we  
20 will basically go back and redo the analysis  
21 with the new database, and see what the

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1 results are. Then we'll, I guess -- 287

2 Finding 14

3 CHAIRMAN GRIFFON: All right.  
4 Let's move on to finding 14. We've got to get  
5 through this matrix, yes.

6 DR. TAULBEE: Finding 14.

7 CHAIRMAN GRIFFON: I have SC&A  
8 will clarify this matrix item and supply  
9 examples of off normal and unauthorized work  
10 practices.

11 DR. MAKHIJANI: This is John  
12 Mauro's baby. John, are you on the line?

13 (No response.)

14 DR. MAKHIJANI: Apparently John  
15 had had a discussion about this at some point,  
16 and --

17 (Laughter.)

18 MR. KATZ: You lost the word. Are  
19 you going to call him?

20 CHAIRMAN GRIFFON: Okay. We'll  
21 pass on that one. If John comes back, we'll

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1 get it later. But right now, it's still on an <sup>288</sup>  
2 SC&A action. That's fine. Number 15.

3 Findings 15 and 16

4 CHAIRMAN GRIFFON: I've got to go  
5 back and find what this is.

6 MR. KATZ: Did you get John?

7 DR. MAKHIJANI: He's not in. I  
8 left a message.

9 MR. MARSCHKE: Oh, that was  
10 something with Ed Brown and John Mauro having  
11 a discussion.

12 CHAIRMAN GRIFFON: That was 14,  
13 yes. So if he comes back, we'll get that.

14 MR. KATZ: I'll send him an email.

15 CHAIRMAN GRIFFON: And number 15,  
16 does anybody have --

17 DR. TAULBEE: My notes indicate  
18 this is a TIB-0052.

19 DR. MAKHIJANI: Yes. This is  
20 going back, I think we've got multiple ways of  
21 saying the same thing here.

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1                   CHAIRMAN    GRIFFON:    Fifteen <sup>is</sup>~~289~~  
2 covered in number 13 or number 12 it says.

3                   DR.   NETON:    We were going to do  
4 13, 15 and 16 altogether.

5                   CHAIRMAN    GRIFFON:    Altogether,  
6 yes, yes.

7                               (Simultaneous speaking.)

8                   DR.   TAULBEE:   Can you combine all  
9 that into one?

10                  CHAIRMAN    GRIFFON:    Yes.  I'll try  
11 to do that.  When I put out a new matrix, I'll  
12 try to do that.

13                  DR.   MAKHIJANI:  Yes.  I understand  
14 we need a new matrix.

15                  DR.   TAULBEE:    Just combine those  
16 into one.

17                  CHAIRMAN    GRIFFON:    Yes, okay.

18                  DR.   MAKHIJANI:  This is a little  
19 bit ancient, you know, from last August, and  
20 it was done with a paper review and the TBD  
21 review, and that was just, you know, a

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1 starting point. 290

2 DR. TAULBEE: Right.

3 CHAIRMAN GRIFFON: Okay, and I  
4 think we covered 16 also, right?

5 DR. MAKHIJANI: Yes.

6 Findings 17 and 18

7 CHAIRMAN GRIFFON: So we're on to  
8 17 and 18.

9 DR. TAULBEE: I can give you a  
10 real quick update on this. Unfortunately,  
11 we're not as far along as what I had hoped by  
12 this time. Actually, I hoped issue 17 would  
13 be done, and I'd have a White Paper out to you  
14 all. The delay is me and my time, in order to  
15 do this analysis.

16 But I do hope to have that out by  
17 -- I expect to have the analysis done by the  
18 end of June, and then getting it out for  
19 review probably by mid-July, out to you all I  
20 hope, for at least issue number 17. This is  
21 neutrons -- or I'm sorry. I'm talking about

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1 issue 18. Issue 17 is going to be done after  
2 issue 18.

3 Issue 18 is the 1962 to 1971  
4 neutrons, and that's the one that I'm  
5 currently working on. I do expect mid-July.

6 CHAIRMAN GRIFFON: And then go on  
7 to the --

8 DR. TAULBEE: The other one will  
9 be following after that.

10 CHAIRMAN GRIFFON: Okay.

11 DR. TAULBEE: For the second one?  
12 The first one.

13 DR. MAKHIJANI: Did you want us to  
14 hold off until we have another Work Group  
15 meeting to review the issue 18 White Paper, or  
16 just go ahead and do it, or what's your  
17 pleasure?

18 CHAIRMAN GRIFFON: Is that a White  
19 Paper on the TIB?

20 DR. MAKHIJANI: No. When the  
21 White Paper comes out --

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1 CHAIRMAN GRIFFON: Oh right. <sup>If</sup>~~292~~  
2 it comes out, no, I think it will be an --  
3 yes. SC&A will review it once it's delivered.

4 DR. MAKHIJANI: Okay.

5 Finding 19

6 CHAIRMAN GRIFFON: All right.  
7 Number 19.

8 DR. TAULBEE: I have that SC&A  
9 will investigate and revise the comment.  
10 That's my notes.

11 DR. MAKHIJANI: I did not do this.  
12 (Laughter.)

13 DR. MAKHIJANI: True confessions.

14 CHAIRMAN GRIFFON: Stay after  
15 class.

16 DR. MAKHIJANI: I apologize. I  
17 apologize for that.

18 CHAIRMAN GRIFFON: All right.  
19 It's carried forward with SC&A action.

20 Finding 20

21 CHAIRMAN GRIFFON: Number 20?

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1 DR. TAULBEE: Okay, number 20~~3~~<sub>293</sub>

2 This was a work in process that we currently  
3 have, when you say you want to know about what  
4 we're doing. Actually, Bob Morris is the one  
5 who's going to be -- who is doing this, and he  
6 is developing an MCNP model, basically from a  
7 worker position standing in the tank farm  
8 area.

9 I think the issue is that a badge  
10 worn on the lapel, and he's working all of the  
11 exposures coming from below them, all of the  
12 scatter radiation from the tops of the tanks,  
13 and would it be under responding for organs  
14 that are a waist type of geometry.

15 So he's working up an MCNP model  
16 on that, and a second model from that  
17 standpoint will be the work of crouching down,  
18 to see what those differences are. He's in  
19 the process of it. We don't have the results  
20 out yet, but once we do, we will provide those  
21 to the Board.

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1 DR. MAKHIJANI: Could I make<sup>a</sup><sub>294</sub>  
2 request while he's doing that?

3 DR. TAULBEE: Sure.

4 DR. MAKHIJANI: As you'll see, as  
5 you read those tank farm data bank entries  
6 that you have, you'll see a lot of the high  
7 radiation rates, if I'm remembering right,  
8 were like when pipefitters were in diversion  
9 boxes and junction boxes and all of you who  
10 have experience in the site, we know what that  
11 geometry is so we can cover that geometry --

12 DR. TAULBEE: For the diversion  
13 boxes?

14 DR. MAKHIJANI: Yes. I mean take  
15 a look at that data bank, and you'll see the -  
16 -

17 DR. TAULBEE: We're isotropic at  
18 that point, because diversion boxes --

19 (Simultaneous speaking.)

20 DR. MAKHIJANI: But they're down  
21 there. So it might not be.

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1                   CHAIRMAN GRIFFON:     We might ~~add~~<sup>295</sup>  
2     that on as one of your scenarios, yes. Just  
3     the rest of the workers --

4                   (Simultaneous speaking.)

5                   DR. MAKHIJANI:        So it's not  
6     hanging there after you come out with your  
7     analysis. Then we go back and decide  
8     something else.

9                   DR. TAULBEE:     Okay.

10                  CHAIRMAN GRIFFON:     No, I agree  
11     with that, because then otherwise people are  
12     going to come back and say we never worked up  
13     there. We were --

14                  DR. MAKHIJANI:     So I just want to  
15     give you some of the external dose entries  
16     from that tank farm data bank. So if Bob  
17     could look at that, and devise sort of the,  
18     you know, claimant-favorable scenarios from  
19     that.

20                  DR. TAULBEE:     And so you're going  
21     to send those to us?

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1 DR. MAKHIJANI: You have that <sup>296</sup>  
2 You have the tank farm data bank entries. You  
3 know, the document we were referring to  
4 earlier that I prepared in the 80s.

5 DR. TAULBEE: Oh, okay. That  
6 document.

7 DR. MAKHIJANI: That document  
8 will, has entries for situations in which  
9 workers experienced high dose rates. So it  
10 might be useful as a point of reference in  
11 devising the scenarios. That's all I'm  
12 saying, for telling which scenarios to devise,  
13 because I think you all have more experience  
14 in that.

15 DR. TAULBEE: Okay. All right.  
16 So we will look then at your document and make  
17 sure that there's some scenarios which you've  
18 discussed in there that we include in our --

19 DR. MAKHIJANI: Yes. That should  
20 be, you know, said to be that these are the  
21 claimant-favorable ones or these are the

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1 situations that would cover all of these other  
2 geometries and the ratios will be less than x.

3 DR. TAULBEE: Okay. We can do  
4 that.

5 Finding 21

6 CHAIRMAN GRIFFON: Okay, and  
7 number 21. This is TIB-0052 again? Is this  
8 an overlapping issue here?

9 DR. MAKHIJANI: Twenty-one is  
10 settled.

11 DR. TAULBEE: Yes, this is  
12 separate.

13 DR. MAKHIJANI: I think 21 was the  
14 pipefitter thing that is done, because this is  
15 an old -- yes.

16 CHAIRMAN GRIFFON: So this is TIB-  
17 0052, coworker bounding for external.

18 DR. MAKHIJANI: External.

19 CHAIRMAN GRIFFON: All workers,  
20 not just the pipefitter. The pipefitter was  
21 the one example, right?

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1 DR. MAKHIJANI: Yes. We looked at <sup>298</sup>  
2 the various job types in the TIB-0052 review,  
3 and pipefitters were sort of the construction  
4 worker type. Steve, I mean this is your baby.

5 So why don't you --

6 MR. MARSCHKE: Well, yes. The  
7 OTIB-0052 review, we looked at different types  
8 of construction workers and we found that  
9 pipefitters tended to get higher exposures  
10 than the other construction workers. I guess  
11 this issue has to do with external exposures,  
12 and I think --

13 As we talked earlier this morning,  
14 I think the solution that we came to was to  
15 put some words into OTIB-0020 and just give  
16 people a warning that, you know, if a claimant  
17 was, you know, identifies himself as a  
18 pipefitter, you may want to take the guidance  
19 from OTIB-0052 with a little grain of salt or  
20 something, and look a little harder at his  
21 dose calculation or put a little adjustment in

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1           there. 299

2                       I forget what the wording was in,  
3           but we did have some suggested wording. Wait  
4           a minute. Maybe I have it actually.

5                       DR. NETON:    The document has been  
6           modified.

7                       DR. MAKHIJANI:    So I think that  
8           this is an issue that has been resolved.

9                       CHAIRMAN GRIFFON:    And the nature  
10          of the corrections is sort of the Site Profile  
11          issue.

12                      DR. MAKHIJANI:    The correction was  
13          to leave it at the discretion of the dose  
14          reconstructor to use a higher correction  
15          factor.

16                      CHAIRMAN GRIFFON:    Okay, because  
17          this is not the way I have it outlined in this  
18          task list. I sort of -- it says NIOSH will  
19          review the coworker model and see what is  
20          bounding for all workers, e.g. pipefitters. I  
21          mean I think we based that on the fact that

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1 you thought that was probably a worst case. 300

2 DR. MAKHIJANI: The pipefitters  
3 were the worst case for external.

4 (Simultaneous speaking.)

5 CHAIRMAN GRIFFON: But we had a  
6 NIOSH action here last time --

7 DR. MAKHIJANI: Yes, okay. Sorry.  
8 So maybe I'm speaking out of turn.

9 CHAIRMAN GRIFFON: I mean if  
10 you're in agreement, no. Maybe it's a done  
11 deal, you know.

12 DR. CHEW: There was a conference  
13 call by phone, and I think all of us  
14 participated in it, where that suggestion was  
15 put together, and that was exactly how it was  
16 resolved.

17 DR. MAKHIJANI: I think it was  
18 resolved that way, and maybe it was resolved  
19 around the time that this was written or just  
20 --

21 CHAIRMAN GRIFFON: Was there a

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1 conference call for the Procedures? I don't  
2 remember.

3 DR. MAKHIJANI: I think it's a  
4 Procedures.

5 MR. MARSCHKE: It was a  
6 Procedures, and it was some time -- it was  
7 quite some time ago when this conference call  
8 was, yes.

9 CHAIRMAN GRIFFON: I might have  
10 missed that one.

11 DR. MAKHIJANI: So the question in  
12 this context is does NIOSH want to adopt a  
13 specific adjustment factor for pipefitters,  
14 given the analysis in our review or not for  
15 SRS?

16 CHAIRMAN GRIFFON: Well, and  
17 that's not even an SEC issue.

18 DR. MAKHIJANI: It's not an SEC  
19 issue. I think --

20 CHAIRMAN GRIFFON: Let me ask the  
21 other part of this task list. I'm not going

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1 to disagree with the conclusion on the  
302  
2 Procedures call, which I don't think I was on.

3 But it says NIOSH, or in my notes for the  
4 task, it says NIOSH -- this is referring back  
5 to Table 6.1.

6 NIOSH will provide an explanation  
7 of why the number of monitored workers is  
8 greater than the number of records.

9 DR. TAULBEE: Yes. That's  
10 actually a different issue.

11 DR. MAKHIJANI: And a separate  
12 issue.

13 CHAIRMAN GRIFFON: It's a separate  
14 issue I know. But I just wanted to make sure  
15 we didn't lose that. That's under 23.

16 DR. TAULBEE: We set it under 23.

17 CHAIRMAN GRIFFON: All right.  
18 I've got it lumped under finding 21 for some  
19 reason. All right.

20 DR. TAULBEE: So is issue 21  
21 closed effectively then, with regard to the

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1 pipefitters, because the guidance to the dose<sup>303</sup>  
2 reconstructers is if you maybe were working  
3 with the pipefitter --

4 (Simultaneous speaking.)

5 CHAIRMAN GRIFFON: As long as SC&A  
6 is satisfied with it, then yes.

7 DR. MAKHIJANI: I think we're okay  
8 with that.

9 DR. CHEW: I think it's probably  
10 listed as in abeyance.

11 CHAIRMAN GRIFFON: Well, but  
12 closed from an SEC standpoint I think. Yes.  
13 Closed from an SEC standpoint I think.

14 DR. CHEW: Yes.

15 CHAIRMAN GRIFFON: All right.  
16 Everybody on the phone all right with that?

17 (No response.)

18 CHAIRMAN GRIFFON: Okay, all  
19 right. I knew we'd close one of these.

20 (Laughter.)

21 DR. TAULBEE: At some point, could

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1 we take a comfort break? 304

2 CHAIRMAN GRIFFON: Right now would  
3 be a good spot actually, yes. Let's take ten  
4 minutes.

5 DR. TAULBEE: Ten minutes.

6 CHAIRMAN GRIFFON: Keep it a  
7 little shorter this time, because we've got  
8 planes to catch.

9 DR. MAKHIJANI: I'll try to call  
10 John again.

11 CHAIRMAN GRIFFON: All right. Ten  
12 minute break on the phone. Be back at 3:25.

13 (Whereupon, the above-entitled  
14 matter went off the record at 3:16 p.m. and  
15 resumed at 3:25 p.m.)

16 MR. KATZ: Okay. So Savannah  
17 River Working Group, and we are just  
18 reconvening after a short break. And Jim, do  
19 we have you back again and Mike?

20 MEMBER GIBSON: Yes. Still here,  
21 Ted.

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1 MR. KATZ: Dr. Lockey? 305

2 (No response.)

3 MR. KATZ: Okay.

4 Finding 14 Recalled

5 CHAIRMAN GRIFFON: Okay. Just to  
6 -- we're just about at the end of this matrix,  
7 believe it or not. We will finish, I'm pretty  
8 sure. I just wanted to give one update.  
9 During the break, we did hear from John Mauro  
10 on finding 14, and he has no further update at  
11 this point on finding 14.

12 So that's going to, on the matrix,  
13 remain an SC&A action item to follow up on  
14 that. Then --

15 DR. TAULBEE: Mark?

16 CHAIRMAN GRIFFON: Yes.

17 DR. TAULBEE: May I propose that  
18 we combine 14 and 25 together, because that's  
19 where my notes had indicated --

20 CHAIRMAN GRIFFON: Fourteen and 25  
21 go together?

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1 DR. TAULBEE: Right. 306

2 CHAIRMAN GRIFFON: Okay. So that  
3 will be 14 and 25. That's fine.

4 DR. TAULBEE: Because I think this  
5 is talking primarily about the burning  
6 grounds, is what the particular issue of  
7 concern was, and I have an update for 25.

8 CHAIRMAN GRIFFON: Oh, okay. All  
9 right. You're going to give me that when we  
10 get to 25?

11 DR. TAULBEE: Yes.

12 CHAIRMAN GRIFFON: Okay, that's  
13 fine. All right. Then right now we're on  
14 item 22, finding 22, I believe.

15 Finding 22

16 DR. TAULBEE: This is on the  
17 badges, and you were to provide the interviews  
18 that you had conducted?

19 DR. MAKHIJANI: Yes. We have  
20 finalized the interviews, and we also did that  
21 spreadsheet that I said I was going to post,

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1 that Bob Barton did for all the petitioners,<sup>307</sup>  
2 We have a completed report nearly that has to  
3 go for DOE review still. So that's what it's  
4 not in your inbox.

5 I'm putting items 22 and 23  
6 together. But we -- well, I'll be done with  
7 it this week and then we'll go to DOE review  
8 next week.

9 CHAIRMAN GRIFFON: Can you just  
10 restate the things you've done and --

11 DR. MAKHIJANI: Well, what we did  
12 was we -- we put together all the petitioner  
13 issues in a spreadsheet, by petitioner, by  
14 affidavit record, and then -- so that  
15 spreadsheet is done and I will post it.

16 The other thing we did was we said  
17 in issue 22 and 23 was, you know, there were  
18 basically the workers said they didn't have  
19 badges on the weekends and that there were  
20 external doses that were not captured, and  
21 that they were in situations without badges

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1 that were supposed to be non-radiological that  
2 were radiological. 308

3 So what we've done is we've gone  
4 and looked at all the external dose issues in  
5 the affidavits, and done a report on that.  
6 Does that accurately characterize what we've  
7 done Steve?

8 MR. MARSCHKE: I believe so, yes.

9 DR. MAKHIJANI: Okay, and so that  
10 report essentially has gone through our  
11 internal review and is just awaiting final  
12 edits from me and we'll go to DOE for review  
13 next week. So you should have that soon.

14 CHAIRMAN GRIFFON: Okay.

15 MR. MARSCHKE: What we looked at  
16 was HPAREH. We've done a lot of studies on  
17 HPAREH before. We did it for OTIB-0052. We  
18 did it for the paper study and so on and so  
19 forth. So we have no surprises in giving you  
20 a preview of what you're going to see in this  
21 report.

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1 DR. MAKHIJANI: Do you want to do  
2 that? Mark?

3 CHAIRMAN GRIFFON: Sure.

4 MR. MARSCHKE: And so really  
5 there's no surprises in that area. As Arjun  
6 said, we did go back and look at the 13  
7 affidavits, and we grouped them into like four  
8 different issues, one of them being pencil  
9 dosimeters going off scale.

10 Another one being unmonitored on  
11 the weekends and other off hours. Another  
12 one, working in supposedly clean areas,  
13 unmonitored in supposedly clean areas which  
14 were later discovered to be contaminated  
15 areas, and the fourth issue was incidents.

16 I think we've already discussed  
17 incidents at this meeting enough. We don't  
18 have to talk about that. In the report,  
19 you'll see that we describe the pencil  
20 dosimeters going off scale, and we kind of  
21 concluded, I guess, that that's not really

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1 going to be a big problem in reconstructing<sup>ing</sup><sub>310</sub>  
2 the doses, because the pencil dosimeters are  
3 not utilized in dose reconstruction anyways.

4 We did make use, actually we did  
5 make use of -- to tie this back to again the  
6 discussion we had earlier of the special  
7 hazards investigations, there were quite a few  
8 SHIs related to pencil dosimeters going off,  
9 and in almost every case the badges were  
10 pulled and so on and so forth.

11 So we found that there was -- that  
12 one was pretty much taken care of. Working in  
13 clean areas without -- unbadged in a clean  
14 area, which was later found to be  
15 contaminated.

16 We kind of point to one of the  
17 OTIBs, which I think addresses -- OTIB-0020, I  
18 think, basically addresses that, and we agree  
19 that that's probably a good way to address  
20 that if you look at the report. We don't have  
21 any major concerns from that.

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1                   The one that we haven't talked<sup>311</sup>  
2                   about so far is the -- working on the --  
3                   badges unavailability on working on the  
4                   weekends, and this was -- one of the  
5                   petitioners' affidavits described that. In  
6                   the interviews that we had with some of the  
7                   SRS workers, there was some confirmation of  
8                   that happening.

9                   Perhaps because they changed the  
10                  badges out on a monthly basis and if the end  
11                  of the month happened to fall on a weekend,  
12                  the badges might not be available. This was  
13                  an independent interviewee that provided this  
14                  information.

15                  So we're still kind of  
16                  investigating that issue at this point, to see  
17                  whether or not, where we're going to go with  
18                  that issue.

19                  DR. MAKHIJANI: The one particular  
20                  worker who said that badges were not on the  
21                  weekends and so on in that affidavit, we

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1 looked at that claim also, and it turned out  
2 he only had external dose records for two of  
3 the four years that he worked there. And we  
4 just point that out.

5 MR. MARSCHKE: Yes. He was a  
6 worker there, yes.

7 CHAIRMAN GRIFFON: So I guess  
8 that's just really a little introduction or  
9 overview, and I'll see the report soon.

10 DR. MAKHIJANI: Yes, and then  
11 there's the incident issue, which I think  
12 remains outstanding.

13 CHAIRMAN GRIFFON: Yes, okay. I  
14 don't think you have any response at this  
15 point, right?

16 DR. TAULBEE: No.

17 DR. MAKHIJANI: Now the  
18 interviews, we have run it through DOE and the  
19 classification review. All that process is  
20 complete.

21 DR. TAULBEE: Have you posted it

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1 on the SRDB? 313

2 DR. MAKHIJANI: No. So that's my  
3 question, is normally we attach interviews to  
4 our final report. We could attach it to this;  
5 we could post the interviews separately. How  
6 do you want it done?

7 CHAIRMAN GRIFFON: I'd say just  
8 post them.

9 (Simultaneous speaking.)

10 DR. MAKHIJANI: So I'll post them  
11 in that SC&A Docs section of the O: drive.

12 DR. TAULBEE: Can I ask that you  
13 post them as SRDB documents?

14 DR. MAKHIJANI: Can we do that?

15 DR. TAULBEE: Because that's what  
16 we do.

17 DR. MAKHIJANI: Can we post things  
18 to the SRDB? I do not believe we can.

19 DR. TAULBEE: No. So send them to  
20 Cheryl. They would get entered then as an SRDB  
21 number.

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1 DR. NETON: Yes -- 314

2 DR. MAKHIJANI: But we cannot.

3 DR. NETON: I don't have write  
4 access to the SRDB.

5 CHAIRMAN GRIFFON: Why don't they  
6 post them on the O: drive, and then if you  
7 guys want to move them over, you can do that.

8 MEMBER CLAWSON: And just make  
9 notification to you that they've been put  
10 there and then --

11 (Simultaneous speaking.)

12 DR. MAKHIJANI: Now these are  
13 individual interviews with names.

14 DR. TAULBEE: Yes. In the SRDB,  
15 that's where all of our interviews are, and  
16 they have individual names on them and that's  
17 why it's restricted from public access.

18 DR. MAKHIJANI: So I'll put it in  
19 the same place where we put Steve's  
20 spreadsheets. Just all the SRS documents that  
21 are SC&A documents that are final, I'll just

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1 put in that place, and then -- 315

2 DR. TAULBEE: Okay, and you're  
3 going to send me an email when they're put  
4 there?

5 DR. MAKHIJANI: Yes, I can actually  
6 probably do it right now.

7 CHAIRMAN GRIFFON: Okay. Is there  
8 anything else on 22? I mean you're  
9 overlapping with 23, but I think there's other  
10 things on 23, right?

11 DR. TAULBEE: Yes.

12 Finding 23

13 CHAIRMAN GRIFFON: All right.  
14 NIOSH has something on 23, I believe.

15 DR. TAULBEE: Yes.

16 CHAIRMAN GRIFFON: The one action  
17 I had was with regard to the NIOSH, an  
18 explanation of why the number of monitored  
19 workers. So that's what you're reporting on?

20 DR. TAULBEE: Yes.

21 CHAIRMAN GRIFFON: Okay, great.

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1 DR. TAULBEE: We broke 23 into  
2 three different parts. One was the  
3 discrepancy and HPAREH discrepancy with the  
4 HPAREH data, and this was your Table 6.1  
5 question. And basically the --

6 CHAIRMAN GRIFFON: So this is  
7 23(c) you're addressing now or 23(a)?

8 DR. TAULBEE: No. I'm addressing  
9 23(a).

10 CHAIRMAN GRIFFON: Okay. I see up  
11 there (c).

12 DR. TAULBEE: Sorry.

13 CHAIRMAN GRIFFON: That's all  
14 right.

15 DR. TAULBEE: This is the question  
16 that you had on Table 6-1 from the SEC, the  
17 original Evaluation Report, and let me pull  
18 this out here.

19 What you were questioning was how  
20 can we have in HPAREH, taking let's say 1952,  
21 for an example, where we had 270 monitored

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1 workers, but we only have 177 shallow dose  
2 records or deep dose records.

3 The response to that, how can we  
4 have less of these records than we have people  
5 monitored, and it has to do with the  
6 assumption of how we define the number of  
7 workers monitored in HPAREH, in that there's  
8 a difference between a blank and then --

9 A blank field that can have a zero  
10 or just a space in it, and then when the data  
11 was transferred into the database, having no  
12 information whatsoever.

13 So in some cases, when HPAREH was  
14 built and they went back and collected other  
15 people's data files, they might not have any  
16 data, or it was non-detectable, and so they  
17 didn't enter into that particular field. But  
18 they were actually working during that time  
19 period.

20 So because that field was not,  
21 what had been populated with a space or with a

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1 zero or something like that, it was counted<sup>318</sup>  
2 then as them being monitored, okay. However,  
3 when they -- when we figured out the shallow  
4 dose records and the deep dose records, if the  
5 record had a zero in it, then we were  
6 including it. If it was just a space, then we  
7 weren't.

8 So this is why there appears to be  
9 less records, okay. These were compared to  
10 the Savannah River Site document, WSRC-RP-95,  
11 S234, and what you'll see is they estimated  
12 more workers being monitored, because they  
13 looked at the original cycle by cycle -- I  
14 shouldn't say cycle by cycle data. They  
15 looked at a larger population.

16 Remember HPAREH, which started to  
17 be populated from 1979 backwards, when people  
18 were still working there. So HPAREH would  
19 have less than what the site had indicated had  
20 been monitored, based upon the monthly  
21 reports.

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1                   So that's why the first column<sup>319</sup>  
2                   there shows more workers. HPAREH is showing  
3                   less, but then the next column over for the  
4                   number of shallow dose records is less than  
5                   what you have for HPAREH, the number  
6                   monitored. Does that make sense?

7                   We will provide this discussion  
8                   and write-up with our issues report that we  
9                   come out with.

10                  CHAIRMAN GRIFFON: All right.

11                  DR. TAULBEE: So that's the first  
12                  part of 23 that we address. The second part  
13                  we actually did a little while ago, and that  
14                  was the internal comparison, the 200 log book  
15                  entries that we discussed back up a ways. I  
16                  had that as 23(b), but --

17                  So then this gets us to the final  
18                  one of 23(c) for us, and this is where you  
19                  asked us had we ever looked at the external  
20                  monitoring records, the hard copy versus what  
21                  was in HPAREH, as to whether there was any

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1 agreement between those data. 320

2 CHAIRMAN GRIFFON: Hard copy  
3 versus HPAREH, okay.

4 DR. TAULBEE: So this is the new  
5 piece that we did, and I've got it up here as  
6 23(c), and this is where we went through and  
7 we looked at 100 workers from -- in 1960. Or  
8 in 1960, we looked at 100 workers from Roll 1,  
9 which would be the salary people, 100 from  
10 Roll 2 and then 100 from Roll 4.

11 These were pulled at random, and  
12 if an entry was illegible, then we went into  
13 the hard copy records, because some of them  
14 are not scanned real well. Then we would  
15 substitute and take the next random number to  
16 go and find them.

17 So you'll see that illegible down  
18 here in this bottom row from the deep dose, we  
19 did deep and shallow dose, by the way, you can  
20 see we only did replacement on four people out  
21 of this whole set, and all of those were in

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1 1960, when the records were much harder <sup>321</sup> to  
2 read.

3 What you'll see is we found a  
4 match of not only the people but also the  
5 dose. For Roll 1, 98 out of the 100, Roll 2,  
6 97, and then Roll 4, we found 93. Roll 4, by  
7 the way, is the construction trades workers at  
8 Savannah River.

9 CHAIRMAN GRIFFON: Right.

10 DR. TAULBEE: So what you'll see  
11 across that top row is that, in general, we're  
12 seeing in the 90 percent range of the doses  
13 from the hard copy records matching what is in  
14 HPAREH.

15 So from a standpoint of using  
16 HPAREH to develop a coworker model, we feel  
17 pretty comfortable that way, whether it's Roll  
18 1, Roll 2, Roll 3 and Roll 4, that the data  
19 set is complete. It's matching the hard copy  
20 records that we have in a reasonable manner.  
21 Any questions?

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1 CHAIRMAN GRIFFON: You're <sup>322</sup>

2 providing this in your write-up too? I mean  
3 we're kind of looking at the table --

4 DR. TAULBEE: Yes.

5 CHAIRMAN GRIFFON: Okay.

6 DR. TAULBEE: I mean really the  
7 important one is that the match is very high,  
8 and in some cases the dose that was in HPAREH  
9 is greater than what's in the hard copy. Then  
10 in very few cases, it looks like out of the,  
11 let's see 1,200 entries, it was less than four  
12 cases out of 1,200 entries.

13 From a coworker development  
14 standpoint, we feel pretty comfortable with  
15 this.

16 CHAIRMAN GRIFFON: And you just --  
17 '60, '65, '70, '75, you kind of just spaced it  
18 out?

19 DR. TAULBEE: We spaced it out by  
20 five years.

21 CHAIRMAN GRIFFON: Right, okay.

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1 Any questions Arjun or Steve? 323

2 MR. MARSCHKE: No.

3 CHAIRMAN GRIFFON: You're going to  
4 put it in your report?

5 DR. TAULBEE: Yes.

6 CHAIRMAN GRIFFON: Good. Okay.  
7 Now I'm getting down to some real fuzzy  
8 actions at the end of this task list, Arjun,  
9 but you may have to help me out here.

10 I think these get into the data  
11 validation, data completeness sort of  
12 questions, and then actually one of the last  
13 items is the SC&A doing an SEC report, which  
14 you have not completed, right?

15 DR. MAKHIJANI: Yes, which I  
16 started, which I called you. With your  
17 permission, I suspended it, pending getting  
18 the data.

19 CHAIRMAN GRIFFON: Right, because  
20 things were a little in flux and you wanted to  
21 wait. Right, yes, right. But I think

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1 similarly what we talked about with Pantex<sup>324</sup>,  
2 you know, we were in a similar situation of  
3 reviewing the Site Profile, now transitioning.

4 Obviously it doesn't start  
5 everything over, but whatever report you  
6 provide will sort of fill the gaps, I guess,  
7 of what you haven't reviewed already in the  
8 Site Profile. You know, you're not starting  
9 again, is what I'm saying?

10 DR. MAKHIJANI: No, no.

11 CHAIRMAN GRIFFON: Right, all  
12 right. I just want to make that clear on the  
13 record, you know, that that's it.

14 DR. MAKHIJANI: I mean we have --  
15 and we have finished the quite big pieces. A  
16 lot of the, other than neutrons, the big  
17 issues.

18 CHAIRMAN GRIFFON: That's fine.

19 DR. MAKHIJANI: Petitioner  
20 affidavits. The big issue is related to  
21 internal dose, and all of those issues had to

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1 be put on the table in an SEC context,<sup>325</sup>I  
2 think.

3 CHAIRMAN GRIFFON: Yes.

4 DR. TAULBEE: I'm sorry.

5 DR. MAKHIJANI: I said other than  
6 neutrons, the main issue relates to internal  
7 dose, and all of those issues have now been  
8 put in an SEC context on the table. Both  
9 sides, you know, NIOSH has very substantial  
10 work in progress, and we put two reports on  
11 the table.

12 CHAIRMAN GRIFFON: So this other  
13 item in here for the data validation, which  
14 Tim just touched on, a lot of this, some of  
15 it, well most of it I think is in perfect  
16 agreement. But it says SC&A will examine  
17 NIOSH's data validation, and I think now that  
18 you've provided us or will provide those  
19 pieces, they'll start that process.

20 DR. MAKHIJANI: Until now, we were  
21 only looking at the --

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1                   CHAIRMAN GRIFFON: Right. There's<sup>326</sup>  
2 one item I'm not sure, and it says NIOSH will  
3 give log book listing to SC&A.

4                   DR. TAULBEE: We did that.

5                   CHAIRMAN GRIFFON: You did that  
6 log book listing? Okay.

7                   DR. TAULBEE: We have it.

8                   CHAIRMAN GRIFFON: Is that log  
9 book listing posted on the O: drive?

10                  DR. TAULBEE: That is when I sent  
11 you an email back in March.

12                  CHAIRMAN GRIFFON: I remember  
13 that. Yes, okay, and that includes. That  
14 includes external dose data, the log books or  
15 that's -- okay, all right. And then the  
16 HPAREH correlation, that's just what we just  
17 talked about. Okay. I have external dose  
18 complete.

19                  I'm just going through the last  
20 little sort of unnumbered issues at the bottom  
21 of this document. External dose completeness.

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1 SC&A will look at the affidavits and  
2 interviews and compile a list of  
3 circumstances. I think you compiled that,  
4 right?

5 DR. MAKHIJANI: Yes, we did that,  
6 and Steve just --

7 CHAIRMAN GRIFFON: And then it  
8 says that issues of completeness will be  
9 revisited after these initial items are done.  
10 I think we still have that.

11 That's sort of hanging out there,  
12 the issues of completeness, because things are  
13 in flux as far as the coworker models and  
14 stuff. So I think you might want to consider  
15 that in your report, your SEC report.

16 DR. MAKHIJANI: So now do you want  
17 me to resume the SEC report, even though the  
18 major issues around internal dose are still  
19 under discussion, or hold off until we have  
20 this, at least this technical call? I'm a  
21 little bit unclear, because some very major

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1 items are coming down the pike through August<sup>328</sup>

2 CHAIRMAN GRIFFON: Yes.

3 MR. KATZ: I think he needs, not  
4 only need the technical call, he needs the  
5 coworker models for --

6 CHAIRMAN GRIFFON: Right, right,  
7 right. But I think if there's, you know, if  
8 you can have placeholders. If there's pieces  
9 you can start on, I would say proceed. If you  
10 have to wait for the technical calls, that's  
11 fine, you know.

12 DR. MAKHIJANI: I'm going to  
13 start, but you know I felt the major pieces  
14 are going to be these, the ones that are still  
15 on the table.

16 DR. TAULBEE: I think one of the  
17 things that would help us though a little bit  
18 is for you to in one place succinctly define  
19 what your concerns are. Even if they're  
20 preliminary at this time, because you haven't  
21 seen our full coworker models or so forth.

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1                   But just to list several items, <sup>59</sup>~~329~~  
2                   that when we're developing those models, we  
3                   can make sure that we try to address them. I  
4                   think that would help us, to have it all in  
5                   one report for you all.

6                   DR. MAKHIJANI:     We covered that  
7                   earlier in response to what Jim said, is that  
8                   they've already given us an opinion about  
9                   whether these internal dose issues are Site  
10                  Profile or SC&A. I thought that we were going  
11                  to deal with the tritium and uranium after  
12                  1965 for now, and then --

13                  And I, just my personal opinion,  
14                  that it would be better to do, to start a full  
15                  report after those, at least those two items  
16                  are looked at, because otherwise it's just  
17                  going and redoing it.

18                  CHAIRMAN GRIFFON:     Yes, that's  
19                  fine, that's fine.

20                  DR. MAKHIJANI:     Is that all right?

21                  CHAIRMAN GRIFFON:     As long as we

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1 keep the ball moving, yes. 330

2 DR. MAKHIJANI: Yes.

3 CHAIRMAN GRIFFON: Okay.

4 DR. MAKHIJANI: Because we've got  
5 plenty of items.

6 CHAIRMAN GRIFFON: Yes.

7 DR. MAKHIJANI: And I can proceed,  
8 you know, as I was before. I actually have  
9 pieces of a draft report.

10 CHAIRMAN GRIFFON: I'm just  
11 looking down the rest of this, and I think  
12 most of it we've hit on already. Updated  
13 matrix. It says SC&A was supposed to update  
14 that, but I'm taking that task on, just  
15 because it helps me to --

16 You know, I want to consolidate  
17 some issues, I want to be able to understand  
18 them better myself where things have gone. So  
19 I'll do that. And then the full SC&A review  
20 report.

21 I think that's all I have. I will

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1 take -- if anyone from the petitioners group<sup>331</sup>  
2 is still with us -- oh, I'm sorry. One more  
3 item here, and then --

4 DR. TAULBEE: Issue 25. Do you  
5 not have that item?

6 CHAIRMAN GRIFFON: I don't have  
7 issue 25, so you can add it on. What is that?

8 Finding 25

9 DR. MAKHIJANI: It is  
10 environmental dose.

11 CHAIRMAN GRIFFON: Oh, okay.

12 DR. TAULBEE: This is the burning  
13 grounds, and I think this was the 14 and --

14 (Simultaneous speaking.)

15 CHAIRMAN GRIFFON: All right. It  
16 wasn't listed on this. I'm sorry.

17 DR. TAULBEE: Okay, and this is --  
18 well, I don't have a big update here, but I've  
19 got a little bit of an update.

20 We are working this particular  
21 issue, and we have identified air sampling

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1 that was conducted down wind of the burning<sup>332</sup>  
2 areas, the burning pits and we are currently  
3 in the process of coding that particular data.

4 It's air sample data; it's not  
5 individual personal data, in order to evaluate  
6 the exposures from those burning pits, the  
7 solvent burning, to document contamination.

8 DR. MAURO: This is John Mauro. I  
9 think that this is very much related to the  
10 other one that I didn't respond to.

11 CHAIRMAN GRIFFON: Yes, that's  
12 what we said. Yes.

13 DR. MAURO: I couldn't hear you  
14 very clearly, but we did not have a technical  
15 conversation regarding it.

16 But I seem to recall now an  
17 earlier meeting, that I think the issue is  
18 very clearly bounded by -- I believe the  
19 problem had to do with the type of model that  
20 was used to estimate doses to workers that  
21 were near these burning activities that were

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1 taking place, and it really wasn't ~~the~~ <sup>333</sup>  
2 appropriate model to use.

3 Then we were talking about  
4 different scale models and you were using a  
5 mesoscale model. I think that the problem has  
6 to do with what type of model do you use to  
7 evaluate exposures to workers that might be  
8 close to such an activity? I believe you used  
9 some models that were not appropriate. It  
10 started to come back to me. I did not look at  
11 it since the last time we talked about it.

12 DR. TAULBEE: Instead of models,  
13 we have actual data.

14 CHAIRMAN GRIFFON: Yes, right.

15 DR. MAURO: You have actual data.

16 Well, we don't.

17 (Simultaneous speaking.)

18 CHAIRMAN GRIFFON: So yes. They  
19 have data now and they're going to -- they're  
20 in the process of assessing that. And we'll  
21 combine those two items, John.

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1 DR. MAURO: Okay, there you go, 334  
2 That puts us in a very good position.

3 MR. KATZ: Does that mean that  
4 John doesn't have to follow up on this?

5 DR. MAURO: Are we off the hook?

6 CHAIRMAN GRIFFON: Yes, maybe.  
7 You don't have to do the action, right?

8 (Laughter.)

9 DR. MAURO: Any way to get out of  
10 doing the work.

11 CHAIRMAN GRIFFON: You're off the  
12 hook. Yes, you're off the hook. Okay. Is  
13 there any others -- I'm sorry, yes. That's  
14 off the list somehow.

15 I think we're at the end of the  
16 issues matrix, but I don't want to, especially  
17 if the petitioners have been good enough to  
18 hang on the phone call all day here, I want to  
19 give them the opportunity to make any  
20 comments. Is anyone still with us?

21 Petitioner Comments

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1 MR. WARREN: I am. I'm Bob ~~Bob~~  
335

2 Warren.

3 CHAIRMAN GRIFFON: Oh hi Bob.

4 Yes.

5 MR. WARREN: There are a couple of  
6 things that we, and I'm not sure --

7 MR. KATZ: Bob, Bob. Can you -- I  
8 don't know if you're on a speaker phone, but  
9 you're pretty faint.

10 MR. WARREN: Okay. I'll move my -  
11 - is that better?

12 MR. KATZ: That's much better.  
13 Thank you.

14 CHAIRMAN GRIFFON: Much better,  
15 yes.

16 MR. WARREN: Okay. I'm not sure  
17 that I waive any objections to the  
18 pipefitters, because I couldn't exactly  
19 understand that scenario. That was one of  
20 those earlier ones.

21 What we had asked for in the

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1 meeting that was January 19th, and we wanted<sup>336</sup>  
2 to have a posting of the definition of  
3 construction workers, and I don't know.

4 I can't find anything on the site,  
5 but in that hearing, you were going to send  
6 the petitioners, make sure that we had the  
7 definitions and what was going to be the codes  
8 for the rest of the construction workers.

9 CHAIRMAN GRIFFON: I vaguely  
10 recall some discussion about that, on what job  
11 classifications that they fall under.

12 MR. WARREN: That was on page 306  
13 of that last Advisory Board Work Group.

14 CHAIRMAN GRIFFON: Three-oh-six of  
15 the last Work Group? Okay. We'll try to  
16 follow up on that.

17 MR. WARREN: In the incidents that  
18 you all were discussing earlier, I've never  
19 have heard anybody talk about the May 2008  
20 interviews that NIOSH conducted in North  
21 Augusta.

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1 All of those 19 pages, I think, <sup>337</sup>of  
2 information need to be followed up on as you  
3 see whether or not they have all of the data  
4 on lacking film badges and not having any kind  
5 of monitors.

6 I mean what seems to be the  
7 argument is that the HPAREH data is some kind  
8 of silver spoon or something. But it won't,  
9 in my opinion the HP data won't reflect when  
10 the workers were not wearing their dosimeters.

11 So in all of these meetings and in all of the  
12 statements, you have over and over again  
13 workers talking about not having monitors or  
14 the monitors working incorrectly.

15 So, you know, it shows zero on  
16 their H report, and over the period of time,  
17 you find a lot of zeroes or, you know, 10  
18 millirems or just no radiation for a worker  
19 because they weren't having the monitors.

20 So I wish at a minimum, somebody  
21 would say that they're looking at this NIOSH

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1 outreach meeting, and analyze all of the  
2 statements by the workers.

3 CHAIRMAN GRIFFON: I think that's  
4 an appropriate comment. I mean I think that  
5 might be something we can task to SC&A.

6 DR. CHEW: Well, why don't we -- I  
7 mean perhaps --

8 (Simultaneous speaking.)

9 DR. TAULBEE: We did look at those  
10 --

11 CHAIRMAN GRIFFON: I believe, yes.  
12 You would have looked at them and considered  
13 them in the Evaluation Reports, but I also  
14 think --

15 MR. WARREN: It's not enclosed in  
16 the Evaluation Report, because they say one  
17 wasn't posted and then the other one, it says  
18 it's not available yet. That's in the  
19 Evaluation Report.

20 DR. MAKHIJANI: What's the date of  
21 the Evaluation Report?

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1                   MR. WARREN:       The date is ~~in~~<sup>339</sup>  
2                   November, I believe.   This occurred in May,  
3                   but they still had in the evaluation that they  
4                   weren't using the outreach interviews.

5                   CHAIRMAN GRIFFON:   Okay.

6                   DR. MAKHIJANI:        Are    these  
7                   interviews on the SRDB?

8                   DR. TAULBEE:         Yes, and they're  
9                   also on the main NIOSH website.  This is the  
10                  worker outreach meetings we conducted back in  
11                  May of 2008.

12                  CHAIRMAN GRIFFON:   I think if --  
13                  I'm not going to dispute that NIOSH considered  
14                  these, but I would ask SC&A -- I think it's  
15                  worthwhile for SC&A to follow up on these, in  
16                  a similar manner that you did with the  
17                  affidavits, where you --

18                  If you can try to consolidate, if  
19                  there's similar comments made by many  
20                  different people, consolidate what you  
21                  identify on those as issues.  I think that

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1 would be useful. They may be consistent with <sup>340</sup>  
2 another issues already reported. But I think  
3 it's worth looking at.

4 DR. MAKHIJANI: You know Mark, and  
5 what I'd like to do is we already have that  
6 report on issue 23 that's very similar, that  
7 Steve reported on earlier.

8 What I'd like to do is just to  
9 defer that and go back to the drawing board  
10 and add what Mr. Warren is saying to that, so  
11 you don't have two reports on one issue.

12 CHAIRMAN GRIFFON: Yes, yes. I  
13 think that's a good idea.

14 MR. KATZ: So Bob, do you follow  
15 that?

16 MR. WARREN: Yes I do, and the  
17 only other thing I wanted to put in the record  
18 was that if you need some tank farm names of  
19 people that were there and had, you know, I'll  
20 be glad to furnish that. I've been  
21 representing hundreds of people since 2002.

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1                   So, if you need some records, then  
2                   somebody can call me and I'll be glad to talk  
3                   to the claimant and get their information, to  
4                   give you their records.

5                   DR. MAKHIJANI:   Should I --

6                   CHAIRMAN GRIFFON:  Yes, go ahead.

7                   DR. MAKHIJANI:   Mr. Warren, could  
8                   you give me your phone number?

9                   MR. KATZ:       Well, don't do it on  
10                  the line here, but --

11                  DR. MAKHIJANI:   After.

12                  CHAIRMAN GRIFFON:  Yes.

13                  DR. MAKHIJANI:   I need to be able  
14                  to get in touch with him.

15                  CHAIRMAN GRIFFON:  Yes, all right.

16                  MR. WARREN:     I mean I don't mind  
17                  giving you my phone number online.

18                  MR. KATZ:       It will be in the  
19                  transcripts.

20                  MR.       WARREN:               [identifying  
21                  information redacted] --

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1 DR. MAKHIJANI: Sorry, say that <sup>342</sup>

2 again?

3 MR. WARREN: [identifying  
4 information redacted].

5 DR. MAKHIJANI: [identifying  
6 information redacted].

7 MR. WARREN: [identifying  
8 information redacted].

9 DR. MAKHIJANI: [identifying  
10 information redacted]. Okay. I'll give you a  
11 call.

12 CHAIRMAN GRIFFON: We'll take you  
13 up on that offer, yes. All right.

14 MR. WARREN: Okay. Well thanks  
15 for your long meeting.

16 (Laughter.)

17 CHAIRMAN GRIFFON: All right.  
18 Thanks for sticking with us. All right. Is  
19 there anything else anybody else on the phone  
20 has a comment?

21 MEMBER LOCKEY: Mark, you did a

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1 good job.

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2 CHAIRMAN GRIFFON: Okay.

3 MR. KATZ: Thank you, Jim.

4 CHAIRMAN GRIFFON: You hung in  
5 there Jim. All right. Okay. If there's no  
6 other comments, I think we're all ready to  
7 adjourn, so meeting adjourned.

8 MR. KATZ: We're adjourned. Thank  
9 you everybody for hanging in with us.

10 (Whereupon, at 3:59 p.m., the  
11 above-entitled matter went off the record.)

12

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