

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

+ + + + +

ADVISORY BOARD ON RADIATION  
AND WORKER HEALTH

+ + + + +

WORK GROUP ON FERNALD SITE PROFILE AND  
SPECIAL EXPOSURE COHORT (SEC) PETITION

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TUESDAY,  
OCTOBER 28, 2008

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The Working Group convened in the Frankfurt Board Room at the Cincinnati Airport Marriot, 2395 Progress Drive, Hebron, Kentucky, at 9:00 a.m., Bradley P. Clawson, Work Group Chair, presiding.

MEMBERS PRESENT:

- BRADLEY P. CLAWSON, Chair
- MARK GRIFFON
- ROBERT W. PRESLEY
- PHILIP SCHOFIELD
- PAUL L. ZIEMER

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## ALSO PRESENT:

TED KATZ, Designated Federal Official  
LARRY ELLIOTT, NIOSH ORAU  
JENNIFER HOFF, ORAU  
MARK ROLFES, NIOSH  
ROBERT MORRIS, ORAU  
LEO FAUST, ORAU  
BRYCE RICH, ORAU  
JOHN MAURO, SC&A  
NICOLE BRIGGS, SC&A  
HARRY CHMELYSKI, SC&A  
EMILY HOWELL, HHS  
NANCY ADAMS, NIOSH Contractor  
LIZ BRACKETT, HHS  
SANDRA BALDRIDGE, Petitioner  
ALLEN CALLAWAY, Fernald Medical Screening  
RAY BEATTY, Fernald Medical Screening  
STEVEN HILL, Office of Congressman Steve  
Chabot  
JIM NETON, Fernald  
ARJUN MAKHIJANI, NIOSH  
HANS BEHLING, NIOSH  
BOB BARTON, SC&A  
BRYCE RICH, ORAU

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

(9:01 a.m.)

MR. KATZ: This is Ted Katz. I am the DFO for the Advisory Board on Radiation Worker Health, and this is the Fernald Working Group. We are about to get started.

The first thing we are going to do is take roll, beginning with the Board members, beginning in the room. I am going to try to not leave anyone out this time, like yesterday. So, Brad, identify yourselves, please.

CHAIR CLAWSON: Okay. Brad Clawson. I am the Chair of the work group for Fernald. I am not conflicted.

MEMBER GRIFFON: Mark Griffon, a member of the work group, not conflicted.

MEMBER ZIEMER: Paul Ziemer, member of the work group, and not conflicted.

MEMBER PRESLEY: Bob Presley, member of the work group; not conflicted.

MR. KATZ: And on the telephone, do

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1 we have Mr. Schofield? No? Okay, not  
2 present. It is early. It's fairly early  
3 right now.

4 Okay. Then starting in the room  
5 with the NIOSH ORAU team.

6 MR. ELLIOTT: Larry Elliott,  
7 director of ORAU; not conflicted.

8 MS. HOFF: Jennifer Hoff, ORAU  
9 team; not conflicted with Fernald.

10 MR. ROLFES: Mark Rolfes, NIOSH  
11 health Physicist. No conflict of interest.

12 MR. MORRIS: Robert Morris, ORAU  
13 team. No conflict.

14 MR. KATZ: How about on the  
15 telephone, NIOSH ORAU team?

16 MR. FAUST: Leo Faust, ORAU team.  
17 Not conflicted.

18 MR. RICH: Bryce Rich, ORAU team.  
19 Not conflicted.

20 MR. KATZ: Okay. That sounds like  
21 that's it for the NIOSH ORAU team. How about  
22 SC&A, starting in the room.

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1 MR. MAURO: John Mauro, SC&A. Not  
2 conflicted.

3 MR. KATZ: And on the telephone?

4 MS. BRIGGS: Nicole Briggs. No  
5 conflict.

6 MR. CHMELYNSKI: Harry Chmelynski;  
7 no conflict.

8 MR. MORRIS: Arjun and Hans Behling  
9 will be joining us. I think they believed the  
10 meeting was starting at 9:30, unfortunately.  
11 So they may not be poking in until then.

12 MR. KATZ: Okay. Then let's go  
13 around, starting in the room -- well, federal  
14 employees first, in the room.

15 MS. HOWELL: Emily Howell, HHS. No  
16 conflict.

17 MS. ADAMS: Nancy Adams, NIOSH  
18 contractor. No conflict.

19 MR. KATZ: And on the telephone,  
20 federal employees.

21 MS. AL-NABUSI: Isaf Al-Nabusi, DOE.  
22 No conflict.

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1 MS. BRACKETT: Liz Brackett with  
2 HHS. No conflict.

3 MR. KATZ: Okay. Then members of  
4 the public and petitioners in the room,  
5 please.

6 MS. BALDRIDGE: Sandra Baldrige,  
7 petitioner.

8 MR. CALLAWAY: Allen Callaway,  
9 Fernald Medical Screening.

10 MR. BEATTY: Ray Beatty for Fernald  
11 Medical Screening, assist the petitioner.

12 MR. HILL: Steven Hill, Congressman  
13 Chabot's Office.

14 MR. KATZ: Thank you. And any  
15 Congressional representatives on the  
16 telephone? Okay then.

17 Has anybody from SC&A joined us?  
18 Arjun? Hans? Okay, I think that covers it.

19 Just phone etiquette, please: For  
20 the folks on the phone, please use your mute  
21 button or your Star-6 except when you are  
22 speaking, please, so it doesn't interfere; and

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1 if you disconnect with the phone, please  
2 actually hang up. Don't put us on hold,  
3 because that will also interfere with the  
4 call. Thanks.

5 Brad, it's all yours.

6 CHAIR CLAWSON: First of all, I  
7 would like to start out by thanking everybody  
8 for coming here for the Fernald Work Group.

9 One of the things I want to make --  
10 especially since we have some people, the  
11 petitioner and so forth, we do have some  
12 material but, unfortunately, there was not  
13 enough time to be able to run it through the  
14 Privacy Act. So that material we will have to  
15 keep here, but once it is cleared, we will be  
16 able to forward it on. It is kind of the  
17 matrix and so forth that we are working  
18 toward.

19 We've got -- John has done a really  
20 good job. Our matrix has gotten very, very  
21 thick. So in being able to have something  
22 that we can handle with and work with, he has

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1 reduced it down to a smaller one with the main  
2 tasks; but the big matrix is still tracking  
3 each one of the places where we have been,  
4 what we have done, how we have corrected it  
5 and so forth like that.

6 So with that, I will turn it over  
7 to John.

8 MR. MAURO: Thank you. Morning,  
9 everyone.

10 Our last meeting was about six  
11 months ago back in -- I guess it was March.  
12 So I thought it might be a good idea, given  
13 the amount of time that has passed, just to  
14 sort of set the table a little bit.

15 In the interim, I took over the  
16 leadership role of the Fernald work, and what  
17 I did to get ready for today is I gathered up  
18 the last versions of the matrices that were  
19 available. Turns out there were a couple of  
20 versions at the time.

21 I believe, Mark, you had one.  
22 Brad, I think you might have had one, and they

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1 were very similar, but I sort of collapsed  
2 them together. Didn't take anything out, just  
3 merged them together.

4 What I did then is said, okay, that  
5 sort of brought me up to date up to the last  
6 meeting, October 2007, and the material up to  
7 but prior to the March meeting that we had in  
8 2008.

9 So what I did was I said, okay, I  
10 am going to take that material, and I will  
11 bring it up to date by incorporating into it  
12 the last work group meeting material, and I  
13 would prepare that matrix and I would  
14 distribute it to everyone. I am assuming  
15 everyone has a copy of the memo that I sent  
16 out dated October 14th. I assume you have it  
17 either electronically or in hard copy.

18 In effect, what I did here was  
19 something a little different. I hope everyone  
20 is okay with that. In our previous matrices,  
21 if you recall, we had like a series of  
22 columns, vertical columns, and I found it

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1 difficult to work with that.

2           So what I did was I made a bit of a  
3 change to the format, that we can stay with or  
4 we could change. It is really your choice,  
5 and if you would -- just by way of brief  
6 explanation of what was done, go to after the  
7 cover memo, you will see that right at the  
8 very top of page 2 of 39, there is the SC&A  
9 finding.

10           SC&A's findings, as you know, are  
11 all contained in a great deal of detail in our  
12 report dated may 2007. So this is where  
13 everything sort of begins from SC&A's  
14 perspective.

15           What I did was I said, okay, I took  
16 each finding, gave it a major heading, and  
17 right underneath the bold heading, SC&A  
18 finding 4.1. By the way, there really are  
19 five findings. There's 4.1 through 4.5.

20           Each finding has a number of sub-  
21 findings. So they are clustered, and that  
22 turns out to be a convenience that I am going

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1 to take advantage of today by starting in the  
2 cluster.

3 For example, the first item really  
4 deals with uranium, and all the issues  
5 surrounding the bioassay sampling, the  
6 milligram per liter issue, and enrichment and  
7 recycled uranium.

8 So it turns out, I would like to  
9 start in the general and then make a specific  
10 for each issue. Anyway, to get back to the  
11 format, this format -- I took it basically  
12 from lessons learned from our procedures  
13 meetings, where we identified the issue. In  
14 this case, it is issue 4.1-1, and it is  
15 described.

16 You may have noticed that I  
17 describe it in a little bit more detail than  
18 it was in the original matrix, so that we know  
19 a little bit more about what that particular  
20 sub-issue is about. So it helps.

21 Immediately below that, you will  
22 see a row called "Draft NIOSH Response." This

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1 is the original response to our issue that was  
2 provided, and it goes way back.

3 And below that, I have extracted  
4 from the previous work group meetings. On  
5 10/27/07 we had a work group meeting, about a  
6 year ago, and this comes directly from that.  
7 And all that is really here is just the action  
8 items. It lists, okay, the work group said  
9 NIOSH would like you to do action items 1  
10 through 7.

11 The next row below that is a  
12 summary of NIOSH's response to those seven  
13 items, and in large respect there is either  
14 response to it or it makes reference to  
15 something that was placed on the O: drive.

16 That effectively -- now just  
17 notice, we are just talking about the very  
18 first sub-issue, issue 4.1. Flip to the next  
19 page, and there is a little bit more  
20 supplementary material related to NIOSH's  
21 response to directives given on 10/24/07.

22 At that point, at the top of the

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1 second page where you see 5 and 7, it says  
2 there, that sort of is the end of the process  
3 that took place up to and prior to the March  
4 26, 2008 meeting.

5 Now starting with the next row,  
6 which is labeled March 26, 2008 Work Group  
7 Meeting, that is the material I prepared. Now  
8 I did something a little different here,  
9 because I felt I needed to do it for me, and I  
10 suspect it might be helpful to you also.

11 For this particular issue there was  
12 quite a bit of discussion held during the  
13 meeting, and so I tried as best I could to  
14 capture it. There may have been 50 pages.  
15 The transcript was over 300 pages, and there  
16 may have been as much as 50 pages dedicated to  
17 just this subject. As I said, I wanted to  
18 make sure that we captured it.

19 So this is something you haven't  
20 done in the past, tried to capture the essence  
21 of what was discussed. Usually, we limit our  
22 matrices to just action items and O: drives.

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1 But I felt that it was important to me to set  
2 the stage, and I left it in. Especially since  
3 we haven't met in six months, I thought you  
4 might find this useful.

5 Then on the very bottom -- and this  
6 is going to be for every one of these issues  
7 that we talk about, in bold is what I --  
8 again, this comes right out of the matrix.  
9 There is nothing here that is my -- in other  
10 words, there is nothing you are looking at  
11 here that is SC&A's opinion materia. This is  
12 material that just tries to capture what was  
13 in the matrix.

14 Now my plan would be, by the way,  
15 that below on this page 2 here -- below, we  
16 are going to start a new row, and it is going  
17 to be called October 28, 2008 Meeting, and  
18 just keep it rolling.

19 So that sort of sets the table on  
20 how -- if everyone is comfortable with that,  
21 that would be my plan.

22 MR. MORRIS: Excuse me, John. If

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1 there are questions or opinions that would be  
2 different from your assessment of the 50  
3 pages?

4 MR. MAURO: Absolutely. In fact,  
5 when I sent this out, the cover memo dated  
6 October 14th -- so it wasn't that long ago --  
7 I indicated please, if I did not faithfully  
8 capture -- because when you read the  
9 transcripts, especially the version I got -- I  
10 don't know who provided it. Ted, you provided  
11 it to me -- it was not official yet. It was  
12 still crude, and I'm treating it as a control  
13 document, since it is not -- in fact, you  
14 know, I had it at home, but I just used it for  
15 my purposes.

16 I did the best I can to read it.  
17 And so, yes, anything in here that you feel is  
18 a misrepresentation, incomplete, missing  
19 something important, absolutely, let me know.

20 And then mechanistically -- this is really  
21 maybe one of the things Mark is concerned  
22 about. We spend more time about form than

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1 substance. Mechanistically -- and correctly  
2 so. I mean, I know on the procedures work, we  
3 spent a lot of time getting our procedures  
4 together.

5 MEMBER ZIEMER: Nonetheless, I  
6 think it is important that we don't let things  
7 slip through the crack, and this will help us  
8 track things.

9 It looks like you are moving toward  
10 something that looks very much like what the  
11 Procedures Work Group is doing in terms of  
12 capturing the results of each meeting and the  
13 responses back and forth. It is probably too  
14 late to convert the system to that.

15 MR. MAURO: I am just doing that.  
16 Quite frankly, I realize there may be -- the  
17 day may come when you would want to do that,  
18 but right now I have to say I found it  
19 impossible to work with the columns and the  
20 other approach and still capture, do the  
21 things that I felt needed to be done by way of  
22 telling the story.

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1 I mean, the columns would go down  
2 for pages.

3 MR. ROLFES: This does look a lot  
4 better, I think.

5 CHAIR CLAWSON: Well, and something  
6 else, too. When asked a question, I guess  
7 John talking about this, we will be able to go  
8 back through. It will make it a cleaner way  
9 to be able to work our way back.

10 MEMBER ZIEMER: Well, this is what  
11 the Procedures Work Group has done. John is  
12 very familiar with that, because he helped  
13 develop that system also, and it does  
14 something similar to this. You can get the  
15 big picture with an overview or you can dig in  
16 and get the meeting-by-meeting process and  
17 progress.

18 MR. MAURO: The time sequence is  
19 tracked vertically down the page here.

20 Okay. With that, what I did was,  
21 realizing the sizes of this, I was starting to  
22 see, well, this is a useful archive document.

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1 In other words, this in effect represents the  
2 history of the work group meetings.

3 I said, but for the purpose of this  
4 meeting, it might be helpful to try to boil  
5 things down a little further, which is what I  
6 did, and I've made some copies of this. No  
7 one has seen this before. It has not been PA  
8 cleared. Neither has this. No one has what I  
9 am about to hand out.

10 I have 10 copies of these. These  
11 may not be enough, but perhaps you can share.

12 I'll hold onto one myself.

13 MEMBER GRIFFON: You don't have  
14 that electronically?

15 MR. MAURO: I do. I have it on the  
16 stick, in fact. I was hoping to project it.

17 MEMBER GRIFFON: Can you pass the  
18 stick around.

19 MR. MAURO: Yes, sure. You guys  
20 got it. Maybe you can load it and then  
21 transfer it to everybody. That might be a  
22 way.

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1 MR. KATZ: For people on the phone,  
2 we are just getting some materials ready, but  
3 let me just acknowledge. Jim Neton has joined  
4 us. Jim, do you have something?

5 MR. NETON: I am conflicted at  
6 Fernald.

7 MR. KATZ: Conflicted at Fernald.  
8 And why don't I just check to see if Arjun or  
9 Hans has had a chance to join us yet.

10 MR. BEHLING: This is Hans, and I  
11 have joined you.

12 MR. KATZ: Okay, welcome, Hans.

13 MR. BEHLING: Good morning.

14 MR. KATZ: And how about Phil  
15 Schofield? Phil, have you joined us? I'm  
16 sorry, Hans, can you just address, are you  
17 conflicted?

18 MR. BEHLING: No, I'm not  
19 conflicted.

20 MR. KATZ: Thank you.

21 MR. MAKHIJANI: Hi, can you hear  
22 me? This is Arjun.

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1 MR. KATZ: Arjun, welcome.

2 MR. MAKHIJANI: Thank you.

3 MR. KATZ: And can you just address  
4 whether you are conflicted?

5 MR. MAKHIJANI: Yes, I am  
6 conflicted, yes.

7 MR. KATZ: Thank you.

8 MR. MAURO: Okay. Mark Griffon has  
9 --

10 MEMBER GRIFFON: I don't see  
11 anything prior to this that is related on this  
12 document. I am just saying, if you wanted to  
13 share it, I think you can share it.

14 MR. KATZ: Let Emily do that then.

15 MR. MAURO: Mark has it, and is  
16 going to electronically forward it, so you  
17 will have it. This again is for the  
18 convenience of this meeting.

19 I would like to start -- first of  
20 all, I would like to point out that the way in  
21 which the tasks, the issues, are grouped are  
22 by groups of five. You will see on the very

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1 first page of this action item matrix I have  
2 issue 4.1, your analysis data for uranium, and  
3 underneath that all of the subparts.

4 As you flip through, you will see  
5 next is 4.2, which has to do with K-65. So  
6 what I would like to do is go through each of  
7 these. First, I would like to talk about this  
8 first cluster called urine data -- urinalysis  
9 data for uranium, and sort of paint the big  
10 picture of where I think we are, and then we  
11 can move into the finer granularity on various  
12 action items and actions taken related to that  
13 subject.

14 Stepping back and going through the  
15 history, I went through both transcripts.  
16 First of all, let me tell you how important it  
17 is to go through the transcripts, especially  
18 with a lot of time passing by, and to sort of  
19 get everything that was discussed.

20 With regard to uranium, a good way  
21 to think about it is, to start off, the heart  
22 of the internal dose reconstruction for all

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1 workers at Fernald for internal exposure is  
2 the milligram per liter measurements of  
3 uranium in urine.

4           Going from the general to the  
5 specific, one of the most fundamental  
6 questions -- points is that NIOSH's position  
7 is that over 90 percent of the workers  
8 throughout the history of Fernald had such  
9 measurements, at least one per year. That's  
10 very important, because that becomes the rock  
11 you are standing on.

12           Now one of the things that came up  
13 was, well, it's important that we confirm  
14 that. That is, confirm it with respect to --  
15 though you have 90 percent, is it possible  
16 there might be some group or groups of people  
17 at different locations, different categories,  
18 different time periods where there is a  
19 paucity of data and, therefore, there might be  
20 some holes.

21           So in order to make sure that it is  
22 complete, one of the things that SC&A was

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1 mandated to do during the last work group  
2 meeting was to go in and sample the database,  
3 the HIS-20 database, to determine if there  
4 are, in fact, any holes in the data, you know,  
5 the completeness question.

6 Even though that is one of the more  
7 recent things that we did -- we are going to  
8 get to other ones -- I felt that that was --  
9 in the order and way in which you think about  
10 a problem on a hierarchy, that was like --  
11 that's a big ticket item. That is, if we  
12 could get by that, then the other things can  
13 be addressed a little more easily.

14 So what I have is another handout  
15 that talks about where SC&A is in answering  
16 that question, because we think that that  
17 question, completeness, is fundamental to even  
18 moving on to talk about anything else related  
19 to internal dosimetry for uranium.

20 Think about it this way. When I  
21 mentioned uranium, I am really talking about  
22 unenriched, enriched, and recycled uranium and

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1 the ability to reconstruct doses. As you will  
2 see, the heart of it starts with having a  
3 complete database on milligrams per liter in  
4 the urine.

5 So I have another handout. Again,  
6 this has not been PA cleared, and I'll tell  
7 you what it is, once everybody gets a copy.  
8 It's on there, too. Everything is on the  
9 stick.

10 It was my intention, by the way, to  
11 project all this on the wall, but we can't do  
12 that. So we'll work with hard copy or  
13 electronic copy.

14 SC&A prepared a sampling plan that  
15 was approved relatively recently. I would say  
16 a week ago, and we have been working on it.  
17 But I think it is important to understand what  
18 the sampling plan is and what it is going to  
19 give you, and how it will help the work group  
20 make judgments pertaining to the completeness  
21 of the database.

22 I have a three-page handout that I

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1 believe everyone should have right now.

2           The first page is what I call the -  
3 - and you have seen this before in the little  
4 form. You know, the sampling plan was  
5 distributed to the work group, and it was a  
6 big statistical description of how things are  
7 going to be done, and some tables that look a  
8 lot like this. But I repackaged it for the  
9 purposes of this meeting and put it into what  
10 I consider to be something a little bit more  
11 understandable for me, and took away some of  
12 the -- lots of the statistical descriptions,  
13 and boiled it down to what I would say common  
14 sense language and what is it we are doing.

15           We basically -- using the  
16 collective judgment of SC&A, we said, listen,  
17 if you were to sort of parse out operations at  
18 Fernald over time and over different kinds of  
19 facilities and in different types of work  
20 categories, if you could demonstrate that the  
21 records are fairly complete for each of these  
22 strata, for example, the statement could be

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1 made that we sampled the pilot plant, the  
2 workers that were in the pilot plant or the  
3 workers that were in the Plant 1, and we  
4 grouped plants 2 and 3 -- if you can go in and  
5 sample it and go grab people -- now these are  
6 people that we sampling -- that worked there  
7 from 1954 to 1967, and we grabbed the records  
8 of those people who worked in the plant --

9 MR. MAKHIJANI: John, can I  
10 interrupt?

11 MR. MAURO: Sure.

12 MR. MAKHIJANI: the dates are  
13 stated erroneously there as '54 to '67. It  
14 should be '51 to '67.

15 MR. MAURO: Oh, okay. I was  
16 wondering about that difference.

17 MR. MAKHIJANI: Yes, except for  
18 plant 750. The dates got mixed up.

19 MEMBER ZIEMER: I think what  
20 happened is you changed the order of the  
21 plants from your previous one, but not the  
22 order of the dates.

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1 MR. MAURO: Ah, there you go.

2 MEMBER ZIEMER: As well as the  
3 periods.

4 MR. MAURO: Okay, thanks, Arjun.  
5 I'm sorry for that mistake.

6 So over that time period -- and by  
7 the way, I am going to -- as a preface, this  
8 is our plan. Now when you go into the -- we  
9 are into the database now. I have been  
10 talking to the folks who have been diving into  
11 this massive amount of material, and our  
12 objective is to do this. But based on our  
13 previous experience, sometimes it has to  
14 evolve a little bit because of certain  
15 constraints. But this is basically what we are  
16 trying to accomplish.

17 So we go into -- as I was point  
18 out, let's say we go into -- let's say we are  
19 able to, and we believe we are able to, go  
20 into identify workers, claimants. Okay?  
21 Claimants that worked in Plant 1 in 1954  
22 through '67, and we say, okay, here is our

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1 population of workers.

2 We are going to go in and randomly  
3 sample from those claimants, and then we are  
4 going to see how many of them have -- each  
5 year, how many bioassay samples for each  
6 worker for each year in that time period.

7 So we've constructed the strata  
8 this way, because we feel that these are --  
9 different facilities, different job categories  
10 and different time periods have meaning in  
11 terms of things being different.

12 So if you are able to capture a  
13 representative sample or if we get a good feel  
14 for the completeness of the data in each one  
15 of these strata, we would be able to walk away  
16 and make a statement regarding the  
17 completeness of the overall dataset to support  
18 those reconstructions.

19 Let's go to the second page.

20 MEMBER ZIEMER: A quick question.  
21 I notice the millwright category has  
22 disappeared in here in your data. Is there a

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1 reason for that?

2 MR. MAURO: Good question. I don't  
3 know the answer. I will have to go back and  
4 check that out. It may have been an error on  
5 my part, as I did with the dates when I  
6 prepared this or maybe it was determined that  
7 that would collapse within one of the other  
8 categories. I can't say. But we will  
9 certainly look into that.

10 CHAIR CLAWSON: John, also this  
11 other job category B looks like we've got an  
12 awful lot tied up into that one.

13 MR. MAURO: That's correct. That's  
14 where we are right now. We have that. In  
15 fact, in the process of preparing this work  
16 plan, we had a little bit of interaction not  
17 only with the Board but also at NIOSH, and  
18 this is the outcome.

19 We would be the first to admit  
20 that, once we move through this process, when  
21 we come out of the back end of the process and  
22 have the results, there will probably be a lot

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1 of questions like that; and we will know the  
2 doability, where things really can't be done  
3 and where more needs to be done, but we've got  
4 to start somewhere. So you're right.

5 CHAIR CLAWSON: But the only thing  
6 that I was bringing up, John -- and this is  
7 Brad -- is, you know, I guess my big one that  
8 I was really worried about was labor pool.  
9 But looking at all of these, they are all  
10 pretty well roving people that rove from place  
11 to place, etcetera, except the laundry.

12 MR. MAURO: Okay.

13 CHAIR CLAWSON: And that was -- You  
14 know, I can understand how come they were in  
15 that group, because they would go throughout  
16 this facility, different places all the time,  
17 except it seems like the laundry kind of sat  
18 in one place.

19 So I was just looking at that, but  
20 you know, I don't know. Maybe they went out  
21 and picked up stuff or something else.

22 MR. MAURO: No. The feedback you

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1 are giving me now is what we need, because we  
2 are doing the work now, and if we can deal  
3 with those issues as we enter into the  
4 process, we will.

5 MR. BEATTY: Excuse me, John, for  
6 interrupting. This is Ray Beatty. You  
7 mentioned the laundry workers being stationary  
8 somewhat.

9 CHAIRMAN CLAWSON: Yes, that it  
10 what I was just assuming.

11 MR. BEATTY: For a point of  
12 clarification, in the later years, especially  
13 in remediation years, they were assigned out  
14 in the project as well to go around picking up  
15 the laundry at what we call satellite  
16 stations. They did not just stay in a laundry  
17 room.

18 CHAIR CLAWSON: Yes. I just --  
19 What I was looking at --

20 MR. BEATTY: The potential exposure  
21 would have been --

22 CHAIR CLAWSON: Okay. So that

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1 answers that question.

2 MEMBER PRESLEY: This is Bob  
3 Presley. At other sites, you generally had a  
4 truck driver and somebody from the laundry  
5 that would go around on a periodic schedule  
6 and pick up laundry. Yes, there is a  
7 potential, very much so, because some of the  
8 dirtiest things are in the laundry.

9 CHAIR CLAWSON: So that may take in  
10 and incorporate all of those into that.

11 MR. MAURO: It might. That doesn't  
12 mean that we don't need more granularity. In  
13 fact, we were in the situation in one of those  
14 where you had to make tradeoffs. How granular  
15 do you go? It is basically our estimate that  
16 it is going to be one or two work hours per  
17 person, and the more we add, the more  
18 granularity, the longer it is going to take.

19 So we thought that we ought to  
20 strike a balance where we get some meaningful  
21 information. That doesn't mean we won't go  
22 back in again, if we need more granularity.

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1           The important point, though, is  
2           that -- remember where we are right now. We  
3           are talking about the issue number one, and we  
4           are saying that one of the most important  
5           things we need to accomplish under issue  
6           number one, which deals with bioassay sampling  
7           of uranium, is its completeness, because that  
8           goes really much to the heart of any SEC  
9           issue.

10           What we are implementing as we  
11           speak is a review of the dataset for  
12           completeness purposes, and this is the way we  
13           are doing it, by creating this matrix of -- or  
14           strata of these categories of plants, job  
15           categories and time periods.

16           Now what Harry Chmelynski, who is  
17           on the line -- correct me if I'm wrong. We  
18           are one page number 2. What I have prepared  
19           on page number 2 -- this might have also been  
20           contained in our original work plan, but in  
21           different form, but I have boiled it down to a  
22           little simpler form for my purposes, is that,

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1       okay, what does that mean, we are going to go  
2       sample from each one of those strata?   How  
3       many people are you going to sample?

4                 Well, it turns out that right now  
5       our plan is for -- By the way, we added the  
6       pilot plant.   In the previous work plan, we  
7       did not have the pilot plant.   When we started  
8       work on this, we all looked at each other and  
9       said, how come the pilot plant isn't in there?

10       So we put it in.

11                 So if you go back to the original  
12       plan, you will see that the pilot plant wasn't  
13       in there, and we judged that we had better put  
14       that in.

15                 MEMBER ZIEMER:   It's in.

16                 MR. MAURO:   I don't think it was in  
17       the original one.

18                 MEMBER ZIEMER:   Well, maybe there  
19       was an earlier version of this.

20                 MR. MAURO:   Well, the pilot plant  
21       is in now.   It's covered.   Okay.

22                 MEMBER ZIEMER:   This is the August

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1 version, and it was in there.

2 MR. MAURO: And it was in there  
3 then. Well, there may have been some back and  
4 forth. But what you are looking at right now  
5 is what we are doing right now. That doesn't  
6 mean we don't need to change it, fix it, make  
7 it better, simplify it, but --

8 Now it turns out that -- Let's talk  
9 about ID number 2, which is Plant Number 1  
10 during time period number 1, which is 1951 to  
11 '67. We are only going to sample three  
12 people. We are going to go in and pull all  
13 the records for a randomly selected three  
14 claimants.

15 In other words, we are going to  
16 have a list of claimants that we are going to  
17 do the best we can to sort according to these  
18 strata, and there will be presumably a lot of  
19 workers that were in Plant 1 in that time  
20 period, claimants. Then we are going to  
21 sample them.

22 Then we are going to make -- From

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1 that, we have our folks then go into their  
2 records, year after year after year, and look  
3 at their records, and we are going to download  
4 what bioassay sample, but also other data. So  
5 it's not just urine data, but it is basically  
6 what are the data available for those people,  
7 and create a database.

8 Now so in effect, what we are  
9 saying is these are the number of people we  
10 are going to sample. I think it comes to  
11 about -- if you add them all up, it comes to  
12 about 150 or something like that. So in  
13 effect, about 150 people are going to be  
14 sampled, and they are going to be parsed into  
15 these different boxes.

16 Now -- and we are going to download  
17 all of the bioassay and other data pertinent  
18 to that person by year, and then create this  
19 database.

20 In the end, most importantly -- the  
21 next page is the results. What this basically  
22 says is, when we are done, we are going to be

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1 able to say for -- the best way I think about  
2 it is we are going to be able to make a  
3 statement associated with the numbers.

4 We are 95 percent confident that at  
5 least 20 percent, 30 percent, 40 percent,  
6 whatever the percent is, of the workers in  
7 that strata have at least one bioassay sample  
8 per year, at least one milligram per liter  
9 measurement per year.

10 So that we could say what  
11 percentage. It may turn out it's 90 percent.

12 We may be able to make a statement. It  
13 depends what the results come back when we do  
14 our sampling. So we will be able to make a  
15 statistical statement regarding each strata on  
16 the level of confidence that at least X  
17 percent of the people in that strata had at  
18 least one, two, three bioassay samples.

19 Now from that -- Now if it turns  
20 out the number is very high -- let's say we  
21 could say that we are 90 percent certain that  
22 80 percent of the workers have at least one

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1 sample. Well, I mean, intuitively that ain't  
2 bad, and you probably can not only reconstruct  
3 the doses for those workers, the ones that  
4 have the samples, and the ones that perhaps  
5 may not have it, which based on that sample  
6 would be not that many, you could build a co-  
7 worker model.

8 The co-worker model, of course, is  
9 a judgment call. For any given person that  
10 doesn't have data, you could use 90 percent  
11 value or 50 percent value, the full  
12 distribution. These are judgment calls that  
13 we consider to be non-SEC issues.

14 The SEC issue is whether or not  
15 that particular strata has sufficient data to  
16 build a co-worker model or not. So this is  
17 the philosophy we are operating under.

18 MR. NETON: I just have a general  
19 question. This is Jim Neton.

20 The general concept seems to be  
21 that you are approaching it that all of these  
22 strata were required to be monitored in the

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1 first place. What happens if you get to the  
2 point where you have an administrative group  
3 that, by your determination, does not have  
4 sufficient bioassays to develop a co-worker  
5 model?

6 What does that really mean at the  
7 end of the day? But a judgment call has to be  
8 made, whether those people really required to  
9 be monitored. There is a gradation of  
10 monitoring in all these work groups. I can  
11 guarantee that.

12 So you've spent a lot of time here  
13 showing these strata, but really, it seems  
14 like it should be front end loaded and say  
15 which groups really needed to be monitored  
16 that had the highest exposure, so you can have  
17 some sort of a valid co-worker bounding model.

18 Where this is pushing it is to have  
19 something like 15 different co-worker models.

20 I'm not sure if -- that's just my opinion.

21 MR. MAURO: Well, I don't want to  
22 leave the impression that this is a co-worker

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1 model study. What this really is is a --

2 MR. NETON: Well, it's what you are  
3 talking about here.

4 MR. MAURO: Well, no. It goes  
5 there. It could get us there. But what it  
6 really asks is the completeness question,  
7 because there is a statement made, and it is  
8 an important statement, that over 90 percent  
9 of the workers were sampled, had at least one  
10 bioassay sampling per year. It's a very  
11 important statement.

12 The mandate that we were given --  
13 that was at the last meeting. Pulled it right  
14 out of the transcripts. And the mandate we  
15 were given is let's go check that, and we came  
16 up with this plan.

17 So when we are done, you're right,  
18 we may find one of these strata -- in fact, we  
19 may find it's difficult to get any data for a  
20 given; strata, and we don't know that.

21 That may mean that we have to say,  
22 okay, what do you do when, in fact, a given

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1 strata really doesn't have any data, for  
2 whatever reason. Maybe they didn't need to be  
3 monitored, or maybe there is a problem. But  
4 at least we are going to know that. I mean,  
5 that's just first things.

6 We are going to know where there  
7 may be people that weren't -- didn't have  
8 bioassay data.

9 MR. NETON: That would come out of  
10 the dose reconstructions. I mean, you have  
11 200 dose reconstructions. You have the job  
12 titles for all of them. You are going to have  
13 monitoring data or you don't.

14 Then the judgment call has to be  
15 made: This was an administrative worker.  
16 Does the co-worker model that reconstructs  
17 from all the universe of monitored workers  
18 adequately bound this particular dose? It  
19 just seems like there is a lot of effort here  
20 that I'm not sure what --

21 MEMBER GRIFFON: Is there a co-  
22 worker model on the table? I don't think --

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1 There is a uranium co-worker model now?

2 MR. ROLFES: There is. Correct.  
3 It wasn't available in the beginning.

4 MR. NETON: That's my point,  
5 though. So then you are --

6 MR. ROLFES: It was sort of like  
7 the Rocky Flats, that we didn't have enough  
8 data to do individual dose reconstruction for  
9 everyone. Then we were testing to see if you  
10 really had enough data for all individuals.

11 With the Rocky Flats, it wasn't  
12 perfect, of course, but when we went through,  
13 we found certain years that were limited, but  
14 we often had explanations. So that fell out,  
15 and that was fine.

16 MR. NETON: Right. That is my  
17 general question. We tried to relay that in  
18 the comments.

19 MR. MAURO: No, no. I guess I'd  
20 look at it like a dictionary. You say,  
21 listen, this is what we have. In other words,  
22 best we can tell, this is how complete a

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1 record we have for all these different strata.

2 MR. NETON: Exactly. But at the  
3 end of the day, what do you do with that?  
4 That's my point.

5 MR. MAURO: Right.

6 MR. NETON: I mean, you stop short  
7 here saying, well, we'll see what the  
8 completeness is for these 15 different  
9 categories. So what does that really mean?  
10 You're going to spend a lot of time doing  
11 that.

12 MR. MAURO: Well, does that mean  
13 that it shouldn't be done?

14 MR. NETON: I don't know.

15 MEMBER PRESLEY: That's what I'm  
16 wondering. Should it be done? I mean, you  
17 are going to spend a tremendous amount of time  
18 and a tremendous amount of money, and you are  
19 going to come up with an upper bounding, the  
20 level up here that is going to be tacked on  
21 for everybody, and I'm just wondering if you  
22 shouldn't go in there and pick out what you

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1 consider or what we consider as to be the most  
2 exposed people and start there.

3 MEMBER GRIFFON: SC&A is not going  
4 to come up with any upper bound, first of all.  
5 That is not their job.

6 CHAIRMAN CLAWSON; Let's go to the  
7 statement that was said. Everybody was  
8 sampled. NIOSH, prove to us --

9 MR. ROLFES: As we have indicated,  
10 90 percent or greater than 90 percent of the  
11 people at Fernald did participate in the  
12 uranium bioassay program. The people that had  
13 the highest potential for exposure, such as  
14 chemical operators, were some of the  
15 individuals who participated in the most  
16 frequent sampling program.

17 Some of those people were sampled  
18 as frequently as multiple times per day.  
19 Other people that were less likely to be  
20 exposed were only typically sampled on an  
21 annual basis.

22 We did develop a white paper on a

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1 uranium intake model, and at the last meeting  
2 I had forgotten that we had done this, because  
3 it was roughly produced about a year ago.

4 So I've got an e-mail from November  
5 7, '07, which has a copy of the white paper  
6 for Fernald or the uranium intake. I don't  
7 have access to the O: drive right at this  
8 moment. So I can't verify that it is there,  
9 but I do have a copy of it in my notes.

10 MR. MAKHIJANI: This is Arjun.  
11 Could I make a comment here?

12 You know, we are required -- you  
13 know, a completeness check is an important  
14 part of an SEC review. This is not a dose  
15 reconstruction review.

16 The other thing is, yes, it's true  
17 that some categories had lower exposure  
18 potential than others, but you know, for  
19 production and maintenance workers it is not a  
20 priori a given that Plant 1 had more exposure  
21 potential than Plant 2 or millwrights had more  
22 than carpenters.

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1           What this allows you to establish,  
2 besides looking at completeness, is it allows  
3 you to establish whether there is a category  
4 of workers that you can select, a major co-  
5 worker model that you can be sure will be  
6 bounding in an SEC context.

7           So I think this kind of exercise is  
8 pretty useful.

9           MEMBER GRIFFON: Mark, can you tell  
10 us what the file name is for that white paper?  
11 I'm on the O: drive right now.

12           MR. ROLFES: It is FENP Urine Co-  
13 Worker Study White Paper.

14           MEMBER GRIFFON: Okay, here it is.  
15 It is on the O: drive.

16           MR. ROLFES: Should have been  
17 placed there last year sometime, November, I  
18 believe, is what the date should have been,  
19 November 2007.

20           MEMBER GRIFFON; I guess when I was  
21 going through the O: drive, I had noticed that  
22 there were no Excel -- Often in these co-

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1 worker models, I look for the Excel  
2 spreadsheets that have the by year, the  
3 distribution's years, etcetera. This is just  
4 the white paper.

5 MR. ROLFES: Let me open it up, and  
6 check to see whether it has those tables.  
7 Yes, the 50th and 84th percentiles are  
8 incorporated within that white paper by year.

9 MEMBER GRIFFON: I see that.

10 MR. MAURO: Well, all I can say is  
11 that we are only one week into the program.  
12 We could kill it. It's your call.

13 CHAIRMAN CLAWSON; This keeps  
14 coming up every time.

15 MR. MAURO: To me, putting this to  
16 bed is going to cost 200 work hours at \$100 a  
17 work hour.

18 MR. MORRIS: From my perspective --  
19 This is Bob Morris, I'm sorry -- the problem  
20 in the structure of your plan is that you  
21 haven't followed the classical data quality  
22 objectives process where you actually define

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1 the decision to be made ahead of the work;  
2 because now we are -- the reason they define  
3 the DQO process, which is that you want to  
4 have a conclusion that you know what your  
5 answer is going to be as the basis for your  
6 design, and I don't see that you -- at the  
7 end, you are wondering, well, what do we do  
8 with it.

9 MR. MAURO: I hear what you are  
10 saying, and I understand the DQO process, but  
11 I think, when you sample data in an array like  
12 this, which captures the universe of workers  
13 without giving any special weight or make any  
14 pre-decisions, the data then speaks to you  
15 It's the first step in the process.

16 Okay, what does this data tell us?

17 MR. MORRIS: Okay, then in this  
18 context, your 200-hour study is a preliminary  
19 study that would go on to feed a second study.

20 MR. MAURO: Not necessarily. It  
21 may turn out that the outcome would be just  
22 about every one of these strata -- it was

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1 written to have a lot of data. In other  
2 words, every single strata we have cut into  
3 and we have sampled from. There is a lot of  
4 data, and it certainly is a judgment call how  
5 much is enough, but it may turn out that  
6 everyone will agree, from that dataset and  
7 that strata, you could build a co-worker  
8 model.

9 In other words, what we are saying  
10 is that it may turn out that everyone was  
11 sampled, but based on the sampling, the best  
12 we could do is say we are 90 percent confident  
13 -- 95 percent confident that 50 percent of the  
14 workers have at least one bioassay sample.

15 MR. MORRIS: Okay, but don't  
16 forget, it's not the question of you could  
17 build a co-worker model. There is a co-worker  
18 model.

19 MR. MAURO: Oh, okay.

20 MR. MORRIS: At some point you've  
21 got to say maybe you've approached it from the  
22 wrong end.

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1 MR. MAURO: Well, I could reverse  
2 it and say how do we know your co-worker model  
3 is going to serve our purposes well?

4 MR. MORRIS: Fair enough.

5 MR. MAURO: This will do that.

6 MR. NETON: Well, it's always been  
7 an issue that the co-worker model assigned  
8 95th percentile, and we have to establish then  
9 that the highest exposed workers were actually  
10 monitored and captured with that model. I  
11 think that's the approach that needs to be  
12 evaluated, not whether laundry workers were  
13 monitored more frequently than chemical  
14 operators, more frequently than work truck  
15 drivers.

16 I mean, to me, I don't know what  
17 that really shows you, other than a priori I  
18 can guarantee you that there is going to be a  
19 stratification of monitored frequencies in  
20 those populations. But were the highest  
21 exposed workers monitored?

22 What you are going to end up with

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1 is 15 co-worker models, and you are going to  
2 end up reducing the dose.

3 MEMBER GRIFFON: You can still use  
4 the overall.

5 MR. MAURO: This is really a  
6 completeness issue. That was the driver,  
7 completeness.

8 MR. NETON: But, see, even if you  
9 still -- if you end up using the overall  
10 model, then you are really not proving  
11 anything other than the fact that laundry  
12 workers are less frequently monitored than  
13 chemical operators.

14 Have you captured the highest  
15 exposed workers in the co-worker model that  
16 NIOSH proposed to you? That's really the  
17 question.

18 MEMBER GRIFFON: I would definitely  
19 start there. I would say --

20 MR. NETON: That's a non-starter.

21 MEMBER GRIFFON: The question is  
22 how do you -- I mean, I think you have to use

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1 a certain amount of judgment, but start by --

2 MR. NETON: But, Mark, you are  
3 going to be there anyway. You are going to  
4 have all these data, and you are going to say,  
5 gee, there's less monitoring data for people  
6 who sort of a priori appear to be less  
7 exposed. So now, let's go back and say, well,  
8 gee, where are the highest exposed -- were the  
9 people who were frequently sampled the highest  
10 exposed workers anyway?

11 I don't know. It would seem like  
12 you have to make an a priori judgment up front  
13 that there were certain categories of workers  
14 that were more highly exposed.

15 MR. MAURO: Now let's say it turns  
16 out you have decided maintenance workers  
17 during a certain time period. We are going to  
18 have that, and now we are going to have  
19 whether they were sampled. We are going to  
20 have their results. It's all going to be  
21 there.

22 MR. NETON: And at the end of the

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1 day, the question is were the maintenance  
2 workers the highest exposed workers or the  
3 chemical operators the highest exposed workers  
4 You almost have to look at the values.

5 MR. MAURO: But, you see, that is  
6 sort of like a dictionary. I mean, it's sort  
7 of like it's all here. Then you pose those  
8 questions: Does this -- for example, let's  
9 say there are certain assumptions you made in  
10 your co-worker model. The data will say, are  
11 those assumptions you have made consistent  
12 with what we are finding in the sampling  
13 thing? That is, I guess, how I look at it.

14 That is one of the values of having  
15 --

16 MR. NETON: I don't know. You are  
17 proposing numbers, not -- I'm not sure if the  
18 sampling strategy there would reflect the  
19 values. You've got a sampling plan --

20 MR. MAURO: I want to drop the  
21 numbers in, too, not only say, yes, he was  
22 monitored, but what were the results.

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1 MR. NETON: Well, I'm not sure that  
2 the statistical basis of the results would be  
3 sufficient to come to any conclusions. You  
4 build a sampling plan based on sampling  
5 frequency, which has nothing to do with --

6 MR. MAURO: That is correct. This  
7 is solely completeness.

8 MR. NETON: So what do workers  
9 mean? I don't know.

10 MR. MAURO: I mean, while we are  
11 there and we have the person's file in front  
12 of us, and we are counting -- We looked up the  
13 HIS-20. It's all there, right along the line.  
14 We have every measurement, every sample taken  
15 by that person on that date.

16 MR. NETON: I understand.

17 MR. MAURO: And it's all there. It  
18 was our sense that the idea of creating a  
19 completeness sampling plan and downloading the  
20 data in the form that we have it here would  
21 add value and help the work group make  
22 judgments regarding it.

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1                   MR. NETON:       That is the work  
2 group's call.

3                   MR. MAURO:     And this is what we  
4 came up with, and quite frankly, we have  
5 accepted it as our own in terms of, yes, I  
6 think that by doing this, when we are done,  
7 there is going to be a lot of information here  
8 that we know is going to help us answer  
9 certain questions, and then may also help us  
10 get a richer understanding of where there may  
11 be some problems, problems that we are not  
12 aware of.     Arjun, yes?

13                  MR. MAKHIJANI:   Just for clarity,  
14 at the present stage we do intend to compile  
15 the measurements as well.   For those who are  
16 on the HIS-20 database, this will be very  
17 straightforward.

18                  MEMBER ZIEMER:   But my point is the  
19 sampling frequency is based on numbers of  
20 samples, not on the doses, the magnitude.

21                  MR. MAURO:     That's correct.   That's  
22 correct.

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1                   MEMBER ZIEMER:    So unless you are  
2                   assuming -- and it may not be a bad assumption  
3                   -- that the sampling frequency must be related  
4                   to the potential exposures, which it probably  
5                   ought to be, but you don't know that a priori,  
6                   I guess, or you might want to look at that.  
7                   But the question is do you have enough samples  
8                   to answer the second question about doses.

9                   MR. MAURO:    Maybe not.    Maybe not.

10                  MEMBER ZIEMER:       Versus    simply  
11                  sampling the frequency.    So that would -- I  
12                  think it goes to Robert's issue, is if you  
13                  haven't decided how you are going to use the  
14                  data, how do you know you have constructed it  
15                  properly?

16                  MR. MORRIS:    Exactly.

17                  MEMBER ZIEMER:       Technically, you  
18                  can only answer the first question.

19                  MR. MAURO:    I agree with you.    Our  
20                  objective and our design was completeness.

21                  MR. BEHLING:    Can I interrupt for a  
22                  second?

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1 MR. MAURO: Sure.

2 MR. BEHLING: This is Hans Behling.

3 I sent to you yesterday by way of a fax a  
4 document that has the issue of control groups,  
5 which we have talked about personally, but I  
6 think some of the questions that have been  
7 raised in the last few minutes can be  
8 answered.

9 If you have that copy available,  
10 maybe during the first break you can discuss  
11 this issue and then bring it up again. But  
12 there are several pages that define various  
13 groups of individuals based on plants'  
14 location and their assignments and their  
15 recommended frequency by which they are to be  
16 monitored that measures everything from the  
17 service quarter, laundry people annually  
18 garage people annually, cafeteria annually,  
19 and then it goes to people like plant A  
20 monthly, higher plant monthly, etcetera.

21 It even gives you the exact numbers  
22 of people who were being requested to submit

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1 their urine sample for analysis. If you take  
2 a look at that, there is a total of five  
3 pages. It actually identifies the dates and  
4 frequencies by these various -- for these  
5 various people, how they are to be monitored.

6 It may give you an understanding of  
7 the issues that were raised by Dr. Ziemer and  
8 others about how do you relate the frequency  
9 of exposure -- or the frequency of monitoring  
10 as opposed to the prospect of being exposed to  
11 higher levels?

12 So maybe you want to take a look at  
13 that during the break, and then come back and  
14 perhaps reorient our thinking.

15 MR. MAURO: Yes, Hans, I have it in  
16 my hand. I did not do anything with it, and I  
17 wasn't planning on bringing this forward  
18 during the meeting. But it sounds like there  
19 may be some value here. I'm not quite sure  
20 where it fits in, but I do have it.

21 MEMBER ZIEMER: Well, my initial  
22 reaction is that your plan would serve to

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1 verify that they are doing what they say here.

2 I don't know if it would go beyond that right  
3 now.

4 In other words, we already know the  
5 sampling frequency, according to that, and you  
6 would be --

7 MR. MAKHIJANI: But, Dr. Ziemer --  
8 this is Arjun. I think that our work  
9 elsewhere has indicated that what is intended  
10 to be the sampling frequency was not always  
11 the sampling frequency.

12 MEMBER ZIEMER: Yes. That is the  
13 point I'm making. It would serve to verify  
14 that they were following that.

15 MR. BEHLING: And I think we have -  
16 - and Arjun would have to speak to this, but I  
17 think you have a sufficient dataset. At  
18 least when you combine the production workers  
19 together, and perhaps the maintenance workers  
20 together, we will have quite a large set of  
21 workers, and we will be able to make at least  
22 some semi-quantitative judgment about whether

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1 the NIOSH model, co-worker model adequately  
2 represents the group with the highest  
3 exposure.

4 If the group with highest exposure  
5 was consistently monitored, then, of course,  
6 the co-worker model for them is entirely moot.

7 But if they were not, then it will become a  
8 very important question, and you may have to  
9 look into whether further work is necessary.  
10 But it may not be.

11 MEMBER GRIFFON: I am trying to  
12 think of the history of this, too, that we --  
13 I mean, I think initially part of the reason  
14 we wanted to look at data completeness, at  
15 least what was in my head, was the fact that -  
16 - I think it was the statements early on that  
17 most of the data reconstructions were going to  
18 be done based on individual data, and we  
19 weren't going to have to rely on a co-worker  
20 model very much.

21 One is in the works, I think,  
22 initially we heard. Now this has been going

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1 on for a while.

2 MR. MAURO: That is correct.

3 MEMBER GRIFFON: But one is in the  
4 works, and we will use it, but only for a very  
5 few cases. And we had that sort of at Rocky,  
6 too. So I think part of what we wanted to  
7 make sure is -- and at the end of the day at  
8 Rocky Flats there was -- a lot of what we came  
9 down to is even the D&D workers, even though  
10 they didn't have a lot of urinalysis data, a  
11 good percentage of them, a high percentage of  
12 them had a close-out urinalysis sample.

13 So even if you didn't have annual,  
14 through that completeness review we found that  
15 we had enough that they could reconstruct.  
16 That was sort of my focus, was if we are going  
17 to do this individually, is the individual  
18 data adequate to support that.

19 It may not be an SEC procedure  
20 requirement, but it is a Board requirement  
21 that we look at this data completeness and  
22 validity issue. So that was sort of my

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1 driver.

2 Now this co-worker model may -- you  
3 know, I'm still not sure -- and this is the  
4 proof of principle side of our Board  
5 procedures. I'm still not sure when, in fact,  
6 NIOSH intends on using the -- I'm just looking  
7 at it online while I'm trying to follow. So  
8 it may be in here, but I'm still not clear on  
9 when you are going to use the co-worker model.

10 Is it going to be if someone has no  
11 urine data. I don't know the conditions, and  
12 the other question would be the application of  
13 it. Are you going to use the 95th or the  
14 50th, and that's important in terms of  
15 answering that question of can it be bounding  
16 for all members of the class, that sort of  
17 thing.

18 I guess my first driver for the  
19 completeness review was my understanding was  
20 that, for the most part, it was going to be  
21 individual DRs, not rely on a co-worker model.

22 MR. NETON: I haven't looked at the

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1 SEC evaluation report in quite sometime, but  
2 usually there is a section in there that talks  
3 about the claimants that we have -- the claims  
4 that we have and how many actually have  
5 internal bioassay measurements, that sort of  
6 thing, and it's probably got us covered.

7 MR. ROLFES: That is right around  
8 93 percent of the individuals.

9 MR. NETON: So for 93 percent of  
10 the claims we have in-house. So seven percent  
11 of the people don't have internal bioassay  
12 data. So that number is already known. We  
13 already know that seven percent of the claims,  
14 at least that we have in-house, don't have  
15 bioassay data.

16 So I would be surprised if this  
17 doesn't show something similar, you know. So  
18 I guess again that is my point. So if you  
19 look at the seven percent that don't have  
20 bioassay data, what are their job categories.

21 You know, what did they do, and then how is  
22 NIOSH going to fill in those seven claims?

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1                   MEMBER GRIFFON:     Out of 300 or  
2 more? I'm saying the other side. Look at the  
3 93 percent and make sure that data is -- you  
4 know, you looked at -- that's probably based  
5 on just -- look at it and say is it adequate  
6 to do the reconstruction.

7                   MR. NETON:     That would seem to be  
8 the place to start rather than the entire  
9 population and universe of all workers that  
10 ever worked at Fernald. I don't know.

11                  MR. MORRIS:     Of all of the co-  
12 worker studies we have probably ever tackled,  
13 the data has been more abundant here than any  
14 other site. That is why I am puzzled about  
15 what is driving this.

16                  There is a couple of hundred  
17 thousand urine samples that we were able to  
18 grab to pull this data together, and you know,  
19 it is -- the idea now of parsing it into  
20 smaller granularity to try to do anything else  
21 with it doesn't make sense to me.

22                  MR. NETON:     It would make sense if,

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1 for instance, you could show that the chemical  
2 operators have no bioassay data, something to  
3 that effect. I mean, it would have to be  
4 almost that egregiously out of whack.

5 MR. MAKHIJANI: This is Arjun. You  
6 know, I think in the evaluation report it  
7 does that say that 90 percent of the workers  
8 or more have bioassay data, but it says  
9 nothing about the frequency of bioassay data.

10 Now, you know --

11 MEMBER GRIFFON: That's my point.  
12 People looking at Plant 2 were monitored once  
13 a year or once in two years. This would be  
14 quite material to your ability to reconstruct  
15 doses, because it's like the -- especially if  
16 you've got episodic exposures.

17 So I think -- and I think, while  
18 the statement that 90 percent of the workers  
19 were monitored may be right on the face of it,  
20 it doesn't tell you whether the frequency of  
21 monitoring of production workers was adequate,  
22 given the solubility, to do the job.

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1                   MR. NETON:    Again, you've got the  
2 frequency list that Hans alluded to here just  
3 a few seconds ago, and basically you would be  
4 either verifying that they did what they said  
5 they did, and that's the whole point of that  
6 exercise.

7                   MR. MAKHIJANI:   Well, that's part  
8 of the thing, yes.  There is an inkling about  
9 what was supposed to be done, and then there  
10 is a verification of that.

11                  MR. BEHLING:   This is Hans again,  
12 and I really do feel very, very strongly about  
13 John distributing that particular document  
14 that I made reference to a few minutes ago,  
15 because one of the things that I asked John to  
16 perhaps bring up at this meeting is whether or  
17 not even people who were monitored on a  
18 monthly basis, as we find here for Plants 2  
19 and 3, Plant 4 and so forth -- and I have the  
20 numbers in front of me -- but the question is  
21 were, in fact, only a subset of those people  
22 monitored.

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1                   That is what, basically, I am  
2 beginning to believe in looking at these  
3 numbers, because the numbers given for Plants  
4 2 and 3 for this one category only involve  
5 five individuals who were monitored on a  
6 monthly basis for the year 1982, and it is  
7 clear to me, or at least it seems clear to me,  
8 that those people do not represent the  
9 universe of the total people assigned to  
10 Plants 2 and 3.

11                   So anyway, I think I would rather  
12 have John show you the document and perhaps  
13 make photocopies during the next break, and  
14 then perhaps we can look at some of that data  
15 and come to some conclusions regarding not  
16 only the frequency by which people were  
17 monitored, but whether or not the total  
18 universe of workers assigned to those  
19 particular locations were, in fact, monitored,  
20 or if it is only a subsample of those workers.

21                   MR. ROLFES: Hans, this is Mark  
22 Rolfes. Were those five people monitored via

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1 only urinalysis or did they also have full  
2 body counts or in vivo --

3 MR. BEHLING: No, this is strictly  
4 a urinalysis schedule. I'm looking at a urine  
5 schedule. I don't even remember where I got  
6 this document from, but it must have been part  
7 of the information that was just downloaded  
8 and was provided to me by the people who wrote  
9 the SEC petition.

10 MR. RICH: Can we get this document  
11 put on the O: Drive or e-mailed out?

12 MR. BEHLING: Well, I don't really  
13 have it, but as I say, John has that document  
14 in front of him.

15 MR. MAURO: Hans, I have five pages  
16 of the material that you are making reference  
17 to. I am sort of thumbing through it as you  
18 speak and trying to connect what you are  
19 saying to --

20 MR. BEHLING: Well, okay. Let me  
21 see.

22 MR. MAURO: Why don't we do it

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1 during the break?

2 MR. BEHLING: It's the third page,  
3 John, that has, for instance, by plants and  
4 the total number of people and their  
5 frequency. And as I said, the document  
6 explains itself, if you just thumb through it.

7 MR. MAURO: Okay. I've got that in  
8 my hand. Yes.

9 MR. BEHLING: And I'm sure Arjun  
10 and other people from NIOSH will be able to  
11 instantly recognize what these data represent.

12 MR. KATZ: Sandra?

13 MS. BALDRIDGE: This is Sandy.

14 MR. KATZ: Sandra, can you just  
15 come closer to the mike, please.

16 MS. BALDRIDGE: I have a question.

17 The historical documents in the petition that  
18 showed extremely high MACs and potential  
19 exposure -- were those ever correlated to see  
20 if, in fact, the workers in those locations at  
21 those times had urinalysis done? I mean, you  
22 may have plenty of records, but if it wasn't

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1 done at the right time on the right people  
2 under the highest exposure, those records  
3 aren't going to give an accurate expression of  
4 what their actual exposure was.

5 MR. ROLFES: Off the top of my  
6 head, Sandra, I couldn't tell you if we went  
7 back and correlated. I apologize. I don't  
8 have the answer right now for you.

9 MEMBER ZIEMER: Could I ask kind of  
10 a reverse question. This is Ziemer. Maybe  
11 I'll ask -- maybe, Jim, you could help me on  
12 this.

13 If the SC&A approach were not used,  
14 how would the information on whether or not  
15 the proposed frequencies or the mandated  
16 frequencies were actually carried out? How  
17 would that come out in the dose reconstruction  
18 process or, in other words, if the frequency  
19 for the chemical operators was not what is  
20 stipulated, would this show up in some obvious  
21 way that you guys would say right away, oh,  
22 something is wrong here?

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1                   MEMBER GRIFFON:    If you expected  
2                   them to have a lot of data, and there's only a  
3                   few data points or something like that.

4                   MEMBER ZIEMER:     Yes.     And what  
5                   would that do in terms of the co-worker model?  
6                   How would the information emerge in some --  
7                   or would it emerge?

8                   MR. NETON:    I don't really think it  
9                   would.   I think --

10                  MEMBER ZIEMER:    I'm trying to see  
11                  if there is value added in doing this or is  
12                  this just something that is going to verify  
13                  what would happen anyway?

14                  MR. NETON:    No.    I don't think --  
15                  Mark Rolfes is closer to this than I am, but I  
16                  don't think that we would end up sort of de  
17                  facto   demonstrating   that   frequency   of  
18                  monitoring in our co-worker model, but it is  
19                  the age-old argument we've had since the  
20                  beginning with this program.   Were, in fact,  
21                  the highest exposed workers targeted for  
22                  monitoring or not, or was it a cohort sampling

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1 or were they, in fact, under-sampling the  
2 highest exposed workers, and the people who  
3 were least exposed were monitored?

4 Those are sort of the three  
5 categories.

6 MEMBER ZIEMER: Yes. And would it  
7 show up, as you develop the model and begin to  
8 use it?

9 MR. ROLFES: I didn't hear your  
10 initial question. Bob just repeated it for  
11 me.

12 MEMBER ZIEMER: I don't know if I  
13 even stated it well, but I'm sort of trying to  
14 get an intuitive feel for what would happen.  
15 Does this add anything to the system?

16 I think I would like -- if there is  
17 value added in what -- if there is no value  
18 added in what SC&A does in some way, then we  
19 have to say why do it, from the Board's  
20 perspective and your own. If there is value  
21 added and something emerges that helps develop  
22 the model or --

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1                   MEMBER GRIFFON: I think what comes  
2 out of this granularity, as you discussed, is  
3 that -- I mean, I don't think anybody here is  
4 arguing that there is not a lot of data  
5 points. I think the question is, when you  
6 start to look by year and by groups that we  
7 think should have been monitored frequently,  
8 and if something falls out like for a couple  
9 of years, all of a sudden no sampling was  
10 being done, if there is not a good explanation  
11 for that, I think there could be a problem.

12                   That happened in Rocky Flats. 1969  
13 comes to mind. You know, there was the  
14 problem with the data there. So it did come  
15 out from doing that granularity check.

16                   MR. NETON: The models are  
17 developed by year, of course, to start with,  
18 and you have a yearly co-worker model. It's  
19 not one model.

20                   MEMBER GRIFFON: I know. I know.  
21 Right.

22                   MR. MORRIS: In fact, this is a

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1 quarterly model.

2 MR. NETON: It is a quarterly  
3 model. Then you have to start looking at, you  
4 know, so this shows maybe some people weren't  
5 monitored, and then you get into these  
6 investigations, which he posed the question on  
7 the original analysis. Well, are you going to  
8 take into account the fact that there were  
9 certain campaigns where the plant was shut  
10 down, there were strikes, there was this.

11 You would have to go back and then  
12 run to ground all of those different  
13 perturbations that could exist in the system.

14 So you end up chasing a lot of issues that,  
15 given that there are thousands of samples per  
16 quarter, I'm sure -- you know, does that  
17 represent the highest exposed workers or were  
18 they, in fact, only sampling workers who were  
19 the least exposed. You know, I don't know.  
20 You would have to look at the distribution of  
21 workers by quarter.

22 MEMBER ZIEMER: But the SC&A sample

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1 is across a big time period.

2 MR. NETON: I think one way to  
3 approach it maybe is look at the air sample  
4 results and say, okay, here is where the  
5 highest air samples were, you know. To me,  
6 that makes more sense than just sort of  
7 looking at a sampling frequency and either  
8 verifying or not verifying that they follow  
9 their plan, but where in fact where the  
10 chemical operators were the highest air  
11 samples, and did they sample those people as  
12 frequently or more frequently than --

13 MEMBER GRIFFON: Going back to  
14 Bob's -- I mean, part of the problem with  
15 setting up data quality objectives, I guess,  
16 is that we've got -- I've got a front end  
17 moving target.

18 If you are saying that you are  
19 going to do DRs based on individual sampling  
20 results for these 90 percent, whatever, I  
21 don't know when the other kicks in. So if we  
22 find -- I mean, if you had -- if I had a

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1 better understanding -- maybe it's in there  
2 again, but if I had a better understanding, if  
3 we find -- you know, if there is an if-then  
4 tree and you look at individuals' results and  
5 you see that they have four urine samples but  
6 for the last 15 years of their work there,  
7 there was nothing, so we have nothing at the  
8 end of that tree, then we are going to be  
9 thrown into the co-worker model, and we are  
10 going to use this criteria to assign dose.

11 That is different than saying that  
12 we don't need the co-worker model for most  
13 cases; we are going to use their own data. My  
14 premise going in was that I want to look to  
15 make sure that the data is adequate to do each  
16 -- by sampling, to do each individual.

17 MR. NETON: You are asking a lot  
18 there, because each case is very specific, as  
19 you know. Many of these cases, I can  
20 guarantee you, you are going to use the 95th  
21 percentile for prostate cancers and such, and  
22 it is not going to make any difference in the

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1 end of the day. I mean, let's face it. These  
2 metabolic organs, kidney, skeleton, liver  
3 maybe, and lung, are the ones that are going  
4 to be more detailed analyses.

5 Virtually, the other cancers you  
6 can use the 95th percentile for internal, no  
7 matter what the data say, and the files  
8 demonstrate that those cancers could not have  
9 a 50 percent probability of causation.

10 So you kind of got to look at the  
11 context on how these are done, too.

12 MR. MAKHIJANI: Can you hear me?

13 MR. KATZ: Yes. Is that Arjun?

14 MR. MAKHIJANI: This is an SEC  
15 investigation. I think, you know, if you look  
16 at this or Rocky Flats or what we've just sent  
17 you on the Nevada Test Site -- I mean,  
18 clearly, we think there are some questions  
19 about whether the data frequency are being  
20 carried out and whether the most exposed  
21 workers were indeed monitored for the relevant  
22 radionuclide.

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1           This problem does become very  
2 acute, if you parse it by period, and I think,  
3 of course, it's up to the Board and the  
4 working group as to whether we do that, but I  
5 think some verification is part of our  
6 procedures, and this is why this was suggested  
7 or the working group had originally taken this  
8 up.

9           There are ways to slice it, and  
10 there are a lot of analyses that can be done.

11          It surely is not going to answer all the  
12 questions, but it seems like a basic check  
13 that we have normally done, these days, I mean  
14 we normally do.

15           MR. NETON: It does seem to me,  
16 though, that if NIOSH has a co-worker model on  
17 the table by quarter for all these years,  
18 that's a starting point for now. I mean, you  
19 are going from the other direction.

20           MR. MAURO: Oh, there is no doubt  
21 that when this was prepared, it was oriented  
22 toward completion. It was oriented toward

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1       completeness.  There is no doubt that, when we  
2       started this, we didn't say, well, let's take  
3       a look at the co-worker model and see if we  
4       can validate that.  That was not what we did.

5               MR. NETON:  Right.  So to me, it  
6       seems to be disconnected.  That's my point.

7               MEMBER GRIFFON:  That's right.  
8       Part of this -- the action came up before the  
9       co-worker model was completed.

10              MR. MAURO:  Now the co-worker model  
11       may make --

12              MEMBER GRIFFON:  Although it's been  
13       out there longer than I think we knew.

14              MR. MAURO:  Well, yes.  I agree.

15              MR. BEHLING:  John, may I  
16       interrupt.  I just talked to Kathy, and she is  
17       about to forward to you electronically those  
18       five pages that I was making reference to.  
19       The only thing that I need to know is who is  
20       going to be receiving this?

21              I have Paul Ziemer, Jim Neton, Mark  
22       Rolfes, Mark Griffon, Brad Clawson, Bob

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1 Presley, and I have Arjun. Is there anybody  
2 else that I need to forward this to?

3 MEMBER SCHOFIELD: Yes. Hans, this  
4 is Phil Schofield. Could you forward it to  
5 me?

6 MR. BEHLING: Oh, yes. I'm sorry,  
7 Phil.

8 MR. KATZ: Ted Katz, too, please.

9 MR. BEHLING: I am going to try to  
10 get this to you momentarily, and perhaps that  
11 document will answer a portion of the  
12 questions that have been raised.

13 MR. ROLFES: Looking back in my  
14 notes, when I had initially seen the sampling  
15 plan, I thought that it might fit better if  
16 NIOSH were using multiple co-worker models,  
17 but that is not what NIOSH does.

18 If we had, for example, a co-worker  
19 model for secretaries, one for security  
20 workers, one for chemical operators, or a  
21 model for each Fernald plant, for example, a  
22 model for each subpopulation that was

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1 mentioned in the proposal -- this is not what  
2 NIOSH does, though. NIOSH co-worker models  
3 are developed using all monitored workers=  
4 data fitted to a log-normal distribution.

5 Those Fernald employees who have  
6 less exposure potential were bioassayed much  
7 less frequently, usually on an annual basis.  
8 Those workers that had greater exposure  
9 potential were bioassayed much more  
10 frequently, sometimes daily, especially for  
11 those with urine concentrations above 50  
12 micrograms of uranium per liter, for those  
13 that were involved in incidents or exposed to  
14 more soluble forms of uranium such as uranium  
15 hexachloride.

16 There are also less monitoring data  
17 for those with lower routine exposure  
18 potentials. Having 24 co-worker models would  
19 likely lower the assigned intakes for the  
20 unmonitored workers in a subpopulation deemed  
21 to have lower exposure potential.

22 MEMBER GRIFFON: Are you planning

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1 on 24 -- I don't understand this.

2 MR. ROLFES: No. SC&A doesn't  
3 develop co-worker models, first of all.

4 MR. MAURO: I think that -- let me  
5 try. We are trying to make too much --

6 MR. ROLFES: If I can respond,  
7 Mark, please. Just a second, please.

8 The initial over 24 different  
9 classes that were presented in SC&A's model.

10 MEMBER GRIFFON: In their sampling  
11 plan, but they are not saying that it is going  
12 to end up being 24 co-worker models.

13 MR. ROLFES: Right. Correct.

14 MR. MAURO: All I was going to say  
15 is that it is simpler than what we are making  
16 the intent of this is. What the intent of  
17 this is, is when we were are done and we find  
18 out there is a load of bioassay samples for  
19 this, we could say with a high level of  
20 confidence that everyone of those strata, at  
21 least 50 percent, 60 percent, have at least  
22 one bioassay sample. Let's say we walk away

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1 with that, and for every single one of these  
2 cells. That is going to be a strong statement  
3 of support.

4 Don't forget, this would be a 95  
5 percent statement. We could be 95 percent  
6 confident that at least these many have at  
7 least one, and so that statement is by number,  
8 or two or three.

9 Now if that is not deemed -- and  
10 when we are done, if that statement can be  
11 made, I think that goes a long way to validate  
12 the position you are saying, that you have  
13 abundant workers of all categories, all time  
14 periods and all buildings, and as a result it  
15 goes toward supporting the idea that, yes,  
16 from that kind of dataset you could just about  
17 build any kind of co-worker model you might  
18 want to.

19 I'm looking at it from the positive  
20 -- if I was wearing your hat, how would I look  
21 at how this would help? Now, granted, if we  
22 come back with some holes, yes, that is going

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1 to cause some headaches, headaches that  
2 perhaps are not real.

3 That is, because you have a paucity  
4 of data in that particular cell, what about  
5 it? But I guess I would say I'd like to know  
6 that, though, and if I do -- because don't  
7 forget, the granularity of this -- this is not  
8 that fine grained. I mean, it's not that -- I  
9 mean, we've grouped big chunks of years.  
10 Basically, that's what happened here.

11 If we do come back with a big hole  
12 in a given year or a segment for a given  
13 plant, I guess I would like to know why. In  
14 other words, there is very low frequency here,  
15 and the answer should be -- There should be an  
16 answer to that.

17 I think that that is what this will  
18 do. It will point us into the places where  
19 maybe we have to ask some questions. How come  
20 it's high everywhere else in the sampling, but  
21 in this particular cell it is not. It doesn't  
22 appear to be. It's a big difference. And

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1 then be able to answer that question  
2 strengthens your position to say, yes, we can  
3 build a co-worker model.

4 MR. NETON: I hear what you are  
5 saying. I still -- my argument is that we  
6 have abundant data, and to me it would be  
7 reasonable to try to demonstrate why the data  
8 we have did not represent the highest exposed  
9 workers.

10 That's the whole point. So you  
11 have fewer samples in Plant 2-3 over a couple  
12 year period. Is the data we have of that  
13 quarter for all the workers on site  
14 representative of the highest exposed workers  
15 in that category? That's the end of the day.

16 That's the bottom line question, not whether  
17 there was -- plant 2-3 was shut down for six  
18 months or broke or something like that.

19 I just don't understand what it is  
20 going to show.

21 MR. BEHLING: It is the question,  
22 and Mark just read out a series of criteria

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1 for sampling, and surely some verification is  
2 needed whether that was done. If you find  
3 large holes in the production workers who had  
4 high potential for exposure, and you have all  
5 monitored worker basis co-worker model and you  
6 have to use that, or say chemical operators or  
7 other workers with high exposure potential,  
8 there surely would be a question.

9 It may not be that they would find  
10 these kinds of gaps in monitoring, but the  
11 issue was to verify those things.

12 MR. NETON: I have said all I am  
13 going to say.

14 MR. ROLFES: To address what Ms.  
15 Baldrige did say before, I apologize. One of  
16 the things -- I didn't have anything in my  
17 head at the moment, and I couldn't think back.

18 But one of the things that was done at  
19 Fernald, for example, is the daily weighted  
20 exposure evaluations that were conducted in  
21 the early days, and those did track individual  
22 employees at each work station.

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1           There were different categories of  
2 workers completing different job tasks at  
3 different stations, each with a breathing zone  
4 sample that was taken, as well as a general  
5 area air monitoring result.

6           Those were compiled for an  
7 individual on an eight and a half-hour work  
8 day to look to see what the exposure  
9 potentials were at different stations,  
10 etcetera, to see what -- I guess, what amounts  
11 of uranium a person could have been exposed  
12 to.

13           There is data that is available  
14 that could be used to go back and compare air  
15 monitoring data from those daily weighted  
16 exposure reports to the urinalysis data. So  
17 there is information that is available, and  
18 that was something that NLO actually did do on  
19 site.

20           There were some examples. There  
21 was a report from J.F. Wing at NOL who had  
22 found that one -- I believe it was an operator

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1 -- had some high urine concentrations, and  
2 what he actually did is mirrored the  
3 individual's work. He tracked him around the  
4 work stations, etcetera, and actually used  
5 himself as another individual who basically  
6 was doing an experiment on himself to see what  
7 his urine concentrations would have been doing  
8 the same work.

9 So there were things that were  
10 done, but we have on the whole done something  
11 like that.

12 MS. BALDRIDGE: Okay. The point  
13 was that in the petition there is also the  
14 affidavit that challenged the practices in the  
15 air monitoring and put some of that data still  
16 in question, the validity of it.

17 MEMBER ZIEMER: Question. This is  
18 Ziemer. Mark or Jim, on the proposed co-  
19 worker model, does it take into account the --  
20 Is it by years or by --

21 MEMBER GRIFFON: By quarters.

22 MR. MORRIS: With minor exceptions,

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1 it is by year -- by quarter. When there were  
2 like plant stand-downs for funding issues or  
3 things like that, there a few years where it  
4 moved back to annualized.

5 MEMBER ZIEMER: So for a given  
6 worker, if you were using -- For a given  
7 claimant, if you were using a co-worker model,  
8 you would go back and make the assignment of  
9 dose by quarters.

10 MR. MORRIS: That's right.

11 MEMBER ZIEMER: And that would  
12 reflect, presumably, whatever campaigns were  
13 going on and so on. That information -- So if  
14 you have a quarter where there is -- or a year  
15 even, whatever time period there is where  
16 there is low activity or not much going on,  
17 then you would expect the sampling frequency,  
18 bioassay frequency, to drop off.

19 That information would not show up  
20 in this sampling plan.

21 MEMBER GRIFFON: Why not?

22 MEMBER ZIEMER: Well, I don't think

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1 you would be able to -- You are sampling over  
2 the total --

3 MEMBER GRIFFON: Absolutely not.

4 MEMBER ZIEMER: So I'm trying to  
5 get a feel for whether it would be more  
6 important -- If we did a sampling plan, would  
7 it be more important to do it by year or by  
8 time periods and have less -- have two or  
9 three--

10 MR. MAURO: More granularity.

11 MEMBER ZIEMER: Well, it depends on  
12 what is more important to look at. In other  
13 words, you could take groups of operators and  
14 lump them together. I don't know. There are  
15 chemical operators and --

16 MEMBER GRIFFON: Do it more like  
17 production maintenance, administrative or  
18 something.

19 MEMBER ZIEMER: Less detail on the  
20 job categories and more detail on years, if  
21 that would help. I'm still trying to get a  
22 feel for what value added we get from doing

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1 this sampling, because if we are really  
2 building -- Again, I know you are saying this  
3 isn't for building a co-worker model, but you  
4 are trying to inform the system on whether or  
5 not the data is adequate.

6 If they are looking at it more by  
7 time periods and you are looking at it more by  
8 job categories, we pass each other in the  
9 night, so to speak.

10 MEMBER GRIFFON: My sense is that -  
11 - and maybe I'm wrong, John, but my sense is  
12 that when you are pulling this data together,  
13 even if you look in a ten-year -- I don't  
14 understand it, but whatever the time period  
15 is, when you are pulling all these records, if  
16 all of a sudden you find that, you know, you  
17 are doing '60 to '70, but 1965 again and again  
18 is coming up as the place where there is less  
19 data, so you flag that. You make a note of  
20 it.

21 It comes back to the work group,  
22 and maybe there is a ready explanation, you

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1 know that agrees with our co-worker; there was  
2 a down period. And it goes away.

3 MR. MAURO: And I am going to ask  
4 Harry, if he is online, you know, when I was  
5 looking at the HIS-20 database, and you are  
6 trying to sort, trying to do Plant 1 for this  
7 time period, well, you have no choice but to  
8 go in and grab all the years in that time  
9 period, all the samples in that time period.

10 In effect, we are going to have  
11 that, but we are going to collapse it into  
12 this form. Now what I am hearing is don't --  
13 you know, there may be some great value to not  
14 collapsing that data.

15 MEMBER ZIEMER: Well, I don't know  
16 if there is.

17 MR. MAKHIJANI: This is Arjun. I think,  
18 as we did for the Nevada test site, there will  
19 be several things we could deliver to you that  
20 will be done during this project. There will  
21 be, as John indicated, a non-collapsed, you  
22 know.

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1           When you grab these claim files,  
2 you will get all of the data, whether it is  
3 quarterly or daily or annual or whatever, and  
4 that will be in the file; and, certainly, as  
5 with the NTS, that can be submitted to the  
6 work group and NIOSH and put up on the O:  
7 Drive. But for the purposes of the procedures  
8 check, it would propose to aggregate.

9           It would propose to aggregate how  
10 many samples do you think you are going to  
11 have based on the monitoring schedules that  
12 are on paper and how many samples do you have,  
13 and for particular years. They just look like  
14 something leaps out at you as 1969 leaps out  
15 at us in Rocky Flats.

16           You know, we did establish an  
17 explanation for it, but it did require further  
18 work.

19           MR. MORRIS: If you would indulge  
20 me one last comment, going back to my first  
21 one, data quality objectives. John, you said  
22 something like, well, we could say with 90

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1 percent certainty that 50 percent of the  
2 workers were monitored as expected, and that  
3 would be a great outcome.

4 MR. MAURO: No. I think a strong  
5 outcome would be if a statement could be made  
6 within that cell that you would be 90 percent  
7 confident -- 95 percent confident that at  
8 least 50 percent of the workers had one sample  
9 per year.

10 Now that seems to be a pretty  
11 strong statement.

12 MR. MORRIS: Okay. Well, let's  
13 stop right there, and then let me finish my  
14 point.

15 You could also, without saying what  
16 the scorecard would be for success ahead of  
17 time, say that is a very weak outcome, and  
18 that that is a matter of opinion that you are  
19 establishing later on instead of up front.

20 MR. MAURO: The only reason I say  
21 strong is that, from there, if you were going  
22 to say, therefore, for those people in that

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1 strata who were not monitored, I am going to  
2 assign the upper 95th percentile from that  
3 dataset.

4 MR. MORRIS: Well, we don't do  
5 upper 95ths.

6 MR. MAURO: Okay, right.

7 MR. MORRIS: We do 50th percentile  
8 for most people or 84th percentile for highly  
9 exposed.

10 MR. MAURO: Then that would not --  
11 In other words, you would not use this  
12 information in that form. In other words,  
13 whatever information is here, once this  
14 database is here, I'm just sort of speculating  
15 that besides giving a sensibility of the  
16 degree of completeness, is there other value  
17 that it might have.

18 I was thinking that it might have  
19 value in validating your co-worker models, but  
20 its primary objective was to make an objective  
21 statement regarding completeness in each cell.

22 That's it.

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1 MR. MORRIS: Okay.

2 MEMBER GRIFFON: Yes, I wouldn't  
3 even say that that -- you know, to sit here  
4 and say that was a good outcome or a bad, I  
5 think you judge that against the original  
6 policy or whatever, or the expectation. You  
7 know, if operators should have been -- If 90  
8 percent of them or if 100 percent of them  
9 should have been sampled four times a year,  
10 and your outcome is that only 50 percent of  
11 them were sampled twice a year, then that is  
12 probably not such a good -- that is not a good  
13 result.

14 So I think it depends on the -- I  
15 think you are right about that. But I think  
16 just to look at the data and see and then I  
17 don't think we need those kind of -- because  
18 my feeling was that, if we try to define those  
19 things up front, then we are going to get down  
20 into this -- well, defining those can be  
21 difficult, I think, because you got to get into  
22 the policy. You got to figure out what --

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1           I think, if we get -- we are trying  
2 to get a sense of this on the work group  
3 level. At least I am. And if it passes the  
4 kosher test, that's where we are going with  
5 this.

6           Then but to the -- to speak back to  
7 the co-worker model thing, I guess my concern  
8 is that, again, how -- I mean, I understand  
9 you can use this for a lot of cancers, and it  
10 is not going to make a difference anyway. But  
11 the point is for those other cancers, I think,  
12 that if the individuals don't have enough  
13 data, I don't think the DR team is necessarily  
14 going to readily go to that 84th percentile  
15 and assign it, because it is going to knock it  
16 over. That will be over-estimating probably.

17           So then they are going to go with  
18 the individuals' data, and that is where it  
19 comes into that data completeness question.  
20 Is it complete for these people? Are the  
21 individual set of records complete enough to  
22 do it.

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1                   MR. NETON: But that is a judgment  
2 call as to what is applied. Is it -- you  
3 know, we have a whole procedure on that, on  
4 what class of workers we see what type of  
5 exposure, whether they should have been  
6 monitored and were highly exposed, were  
7 administrative workers and probably didn't  
8 need to be, and then there is that middle  
9 category that we assign.

10                   That has been proceduralized. We  
11 have been using that for five years. That's a  
12 judgment call that always happens on a dose  
13 reconstruction. It's not unique to Fernald.

14                   MR. ROLFES: Data completeness is  
15 evaluated for every dose reconstruction that  
16 is done. It is one of the first things that  
17 we do.

18                   MR. NETON: I would argue that it  
19 works to the claimant's favor if only chemical  
20 operators were monitored, for example. If  
21 this study shows that no administrative  
22 workers were monitored, I would say it is

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1 going to -- primarily, the higher exposed  
2 workers are monitored. That's my opinion, and  
3 I think that's true.

4 So this study shows that, and maybe  
5 there are some holes in the lower exposed  
6 workers. Well, that is as biased as the co-  
7 worker model high at the end of the day  
8 anyways. So I don't really see the value. I  
9 should shut up.

10 MR. MAURO: Well, I'm not here to  
11 sell this. I'm here trying to say that where  
12 -- and I was given a mandate to come up with a  
13 sampling plan that would evaluate completeness  
14 of the records, and this is what we came up  
15 with, and this is what we initiated a week ago  
16 to do that.

17 Now I think that this is fine.  
18 What we are really doing is second guessing  
19 that judgment. Is this going to add value?  
20 That's fine, but our intent was to try to  
21 address completeness questions the way I just  
22 described it.

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1                   We will do whatever the work group  
2 would like us to do.

3                   MEMBER GRIFFON: What is the -- can  
4 I step back? What is the procedure for  
5 evaluating the data completeness for an  
6 individual DR claim? It's not Fernald-  
7 specific. It's global. What is the  
8 procedure?

9                   MR. ROLFES: That's an important  
10 thing that --

11                   MEMBER GRIFFON: What is the  
12 procedure?

13                   MR. NETON: I don't know there is a  
14 procedure that says --

15                   MEMBER GRIFFON: I don't think  
16 there is. That's why I'm asking.

17                   MR. NETON: -- if the data are not  
18 -- if there are insufficient data in a record,  
19 what class of -- what part of the co-worker  
20 model was assigned? That's a procedure.

21                   MEMBER GRIFFON: Right. That, I  
22 agree with.

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1 MR. NETON: But the value judgment  
2 has to be determined whether or not the data  
3 are sufficiently adequate in the file itself.

4 If you have one bioassay record representing  
5 20 years of exposure, that's clearly not  
6 adequate.

7 MEMBER GRIFFON: Right. But that's  
8 kind of an internal dosimetrist's judgment,  
9 right?

10 MR. NETON: Exactly.

11 MEMBER GRIFFON: So we are saying  
12 let's look at the whole class and do that  
13 judgment.

14 MR. ELLIOTT: It is also reviewed,  
15 too, the peer review process.

16 MR. NETON: How could you proceed,  
17 Mark, if you got --

18 MEMBER GRIFFON: You can't. You  
19 probably can't.

20 MR. NETON: -- if you have a sample  
21 at the last day of employment and you can say,  
22 well, what was that guy's maximum exposure

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1 that he would have that sample on the last day  
2 of employment, one bioassay point is adequate  
3 probably.

4 MEMBER GRIFFON: Right. You  
5 probably can't, but if you got a boatload of  
6 data and you are missing everything -- you are  
7 missing a big time period, then you might have  
8 -- that's what this is going to show.

9 MR. NETON: Then the internal  
10 dosimetry implementation guy talks about  
11 whether you use nearby data to fill in those  
12 gaps or you apply the surrogate, the co-worker  
13 model in the middle.

14 I mean, there's a lot of different  
15 ways to do this, and that's -- those have been  
16 done many, many, many times, many different  
17 ways, but always to the claimant's benefit.

18 There are many ways to fill in the  
19 gaps of the bioassay. The co-worker model is  
20 one of them. You just couldn't proceduralize  
21 this down to the nth degree.

22 MEMBER GRIFFON: No. No, I'm not

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1 saying that. I'm not suggesting that. I was  
2 just asking -- the statement was made that  
3 data completeness is reviewed as the first  
4 thing based on procedures.

5 I don't know that a procedure  
6 exists. That's all I was asking.

7 MR. ROLFES: To my knowledge, I  
8 can't mention a procedure number or anything,  
9 but as part of the dose reconstruction  
10 process, if you look at the individual's  
11 dosimetry data and see large amounts of  
12 external exposure and see that the individual  
13 was, for example, a chemical operator we use,  
14 and you don't see any bioassay data in there,  
15 that certainly would raise a flag on the data  
16 completeness.

17 So a review like that would be done  
18 and would trigger us to know that, hey,  
19 something doesn't sound right here; we need to  
20 apply the co-worker model in this case,  
21 because the data appear to be incomplete, or  
22 that would prompt, for example, another

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1 request from DOE to --

2 MEMBER GRIFFON: Yes. A new  
3 question: Where is this guy's records?

4 MR. ROLFES: Right. Things like  
5 that are done on every dose reconstruction.

6 MEMBER GRIFFON: I guess what this  
7 is doing is saying, if that is happening on a  
8 frequent basis, you got a problem, because  
9 then in that case you just described, that  
10 means you are missing those upper people that  
11 Jim described, and then your co-worker model  
12 is skewed.

13 So I don't think there is any --  
14 I'm not sure how many person hours this takes  
15 to do, but I think it is beneficial. I think  
16 there is value added.

17 MR. NETON: Two hundred person  
18 hours?

19 MR. MAURO: Yes, 200 work hours.  
20 We estimate about 200 work hours for this.

21 MEMBER GRIFFON: Which we have just  
22 about spent now discussing it.

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1 MR. ROLFES: Brad, should we take a  
2 break?

3 CHAIR CLAWSON: Well, I just want  
4 to be able to say one thing. I've listened to  
5 all this, and here it comes back one thing,  
6 and that is completeness of data.

7 The reason I wanted to start this  
8 up front is every work group I have been on,  
9 we end up coming back to this question at the  
10 very back end of it. I wanted to have it put  
11 up front now.

12 If we can't come to that, then I  
13 guess we can come up to the very end of it  
14 again and get right back into it.

15 So, John, you know, I kind of feel  
16 like John has been -- I asked John, because  
17 this has been an issue at, it seems like,  
18 every work group I've got on, and I wanted to  
19 try to get it done up front instead of at the  
20 very end of it, because it gets kind of  
21 convoluted there.

22 We will discuss that.

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1                   MEMBER GRIFFON: The last thing I  
2 will say before -- because we need a break to  
3 think about this, but I think we need to think  
4 about the other obvious audience in this, and  
5 the petitioner has brought this up, and I  
6 think it is up to the Board in some way to be  
7 able to respond to the petitioner's concerns.

8                   If at the end of the day, like  
9 Rocky Flats -- you know, I'm not sure we've  
10 convinced everyone in the room. I'm pretty  
11 sure we didn't, but our conclusion and SC&A's  
12 conclusion was that it was complete. But we  
13 went through it, and we've made the effort to  
14 look at that closer, and it was in part to  
15 address the petitioner's concerns.

16                   So I think we need to go through  
17 this process. I'll leave it at that.

18                   CHAIR CLAWSON: That said, we will  
19 take a break.

20                   MR. KATZ: Ten minutes?

21                   CHAIR CLAWSON: Ten minutes.

22                   MR. KATZ: Okay. So it's about

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1 10:30. We will take up again about 10 to  
2 eleven.

3 (Whereupon, the above-entitled  
4 matter went off the record at 10:36 a.m. and  
5 resumed at 10:57 a.m.)

6 CHAIR CLAWSON: We can go ahead and  
7 start back up. We've got a few housekeeping  
8 issues to take care of.

9 MR. KATZ: Folks on the phone, this  
10 is the Fernald Working Group. We are getting  
11 started again. Sorry it was a little bit  
12 longer break than we intended. Brad, it's all  
13 yours.

14 CHAIR CLAWSON: First of all, I  
15 would like to apologize, some of this  
16 information getting out late and so forth.

17 As John would say, I would like to  
18 tell a little bit of a story. Part of the  
19 story is here a couple of months ago Hans  
20 Behling was doing a marvelous job at turning  
21 the reins over to John, and so John had to  
22 kind of start back up.

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1           One of our goals, and especially  
2 with Fernald, is to be able to get this  
3 information cleared so that we can hand it out  
4 to the petitioners and so forth that are with  
5 us here today, and we weren't able to do that.

6           I take a lot of the blame for it, because we  
7 were going through a lot of different things,  
8 changing the matrices and so forth like that.

9           I know that John did send it in for  
10 Privacy Act review, but we didn't get it back  
11 in time, and there have been some concerns  
12 with that. I would like to just let -- well,  
13 anyway, the petitioners that we have here and  
14 co-petitioners wanted to voice a concern, and  
15 I will turn that over to Ray Beatty who wanted  
16 to make a comment.

17           MR. BEATTY: Yes. I am Ray Beatty,  
18 a former worker, and I assist the petitioner.

19           I am really not listed as a co-petitioner on  
20 the active petition, but I have worked with  
21 her rather closely for the last couple of  
22 years.

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1           It was stated earlier in the  
2 meeting, it has been six months since we had a  
3 meeting, and at that meeting prior to this  
4 one, there was also a matrix handed out, and  
5 we were privileged to it initially. Then it  
6 was taken from us because of privacy.

7           Quite frankly, that is, I feel,  
8 very disingenuous to the petitioner. A lot of  
9 the people out there filing claims already see  
10 a lot of problems where they think it is  
11 unfair, and when the petitioner comes to  
12 something like this, that person should at  
13 least be privileged to the information.

14           I didn't know that this other  
15 transition had taken place with SC&A. So in  
16 fairness to that agency, you know, I kind of  
17 reviewed some of my comment, but I still think  
18 it is really not showing transparency to the  
19 petitioner to not be privileged to this  
20 information when it is presented so they can  
21 at least follow along and make rebuttal when  
22 it is necessary.

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1           It's kind of like the laundry issue  
2 earlier, and about the millwright being  
3 omitted. You know, I would have seen that  
4 personally if I had looked through that list.

5       So I am taking kind of personal exception to  
6 some of the things that are being developed,  
7 but we don't have input.

8           So that is just my comment in a  
9 nutshell, and I don't mean to take up the  
10 working group's valuable meeting time, but I  
11 just think this has some relevance. In the  
12 future, possibly, if there is going to be a  
13 document reviewed, if it is a new matrix or  
14 whatever, that it could be -- names could be  
15 redacted or, if there was a privacy issue.

16           Rest assured that -- I know Mr.  
17 Callaway and myself -- we received some very  
18 extensive training on the HIPAA consent law  
19 and disclosures and the Privacy Act. We are  
20 very cognizant of those requirements, and we  
21 respect that.

22           So rest assured that we just want

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1 to follow along and be privileged to something  
2 where we can have comment.

3 Anyone else that would chime in,  
4 feel free to do so, but I just feel like it is  
5 a fairness issue, and I think it could be  
6 fixed at the upcoming meetings. Thank you.

7 MR. KATZ: Thank you, Ray.

8 MR. HILL: This is Steven Hill from  
9 Congressman Chabot's office. Just briefly,  
10 Brad, I appreciate you raising that issue, and  
11 I'm sure you will make the necessary steps to  
12 address that in the upcoming meetings. So I  
13 appreciate that, as well as the comments from  
14 Ray.

15 MEMBER ZIEMER: Yes, and I think,  
16 certainly, the Board members agree with Ray's  
17 statements.

18 CHAIR CLAWSON: Definitely do.

19 MEMBER ZIEMER: Actually, we also  
20 feel somewhat of a little frustration. The  
21 rules of the game have changed even for the  
22 Board as we have proceeded, and now there is

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1 some additional security issues that have come  
2 into play that weren't there before, and it  
3 delays some of the documentation. But our  
4 General Counsel and others are working very  
5 hard to keep the turnaround time short.

6 So we just need to be careful when  
7 we schedule the meetings and get the  
8 documentation far enough in advance so that we  
9 can get it distributed. I think it is  
10 certainly our intent.

11 This is a little glitch today, but  
12 I think we can avoid it in the future.

13 CHAIR CLAWSON: And in all fairness  
14 to John, I am probably the main one to put the  
15 glitch in it a little bit, because he produced  
16 an awfully big document, and he did a good  
17 job. The smaller one -- that was to help us  
18 out a little bit on that, and John has been  
19 working very diligently.

20 I will personally take it as an  
21 action item to be able to make sure that these  
22 things are sent in to Emily and everybody in a

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1 timely manner to be able to get this done.

2 This was a glitch, and I apologize  
3 to everybody for that.

4 MS. BALDRIDGE: I'm a good  
5 listener.

6 CHAIR CLAWSON: Well, I know it,  
7 but you know what? It's really good to be  
8 able to follow along, and we had this glitch  
9 the last time, and I swore we weren't going to  
10 get into that again, and it happened again,  
11 and I apologize to everybody that's here for  
12 that.

13 MR. ELLIOTT: You are right that we  
14 need to provide these documents as soon as we  
15 possibly can, but let's be real about this.  
16 In many instances, these documents come a week  
17 before, two days before.

18 I would offer that we have set a  
19 precedent with Ms. Baldrige in one of these  
20 meetings where the DFO and OGC and other  
21 appropriate individuals have looked at the  
22 documents about to be discussed and shared

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1 those, if they didn't contain Privacy Act. In  
2 one case, they did contain Privacy Act, but we  
3 asked that they not leave the room and not  
4 take notes.

5 So I would offer that, you know,  
6 the precedent has been set in that regard.  
7 The two documents that were discussed in the  
8 previous discussion this morning, I asked if  
9 Emily would look at them, because I didn't see  
10 any Privacy Act information in those two brief  
11 documents and thought that it could be shared  
12 under that precedent that we had set.

13 So I think we all should remember  
14 that as an option if the documents are  
15 generated in such a late fashion that we can't  
16 get them fully redacted or Privacy Act  
17 reviewed for release. We can avail ourselves  
18 of that option perhaps.

19 MS. HOWELL: Can I just add? I  
20 mean, that's fine. It is okay when it is a  
21 short document. The problem is -- and Mr.  
22 Beatty brought up frustration with documents

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1 being handed out and then taken back up.

2 If we are able to do an on-site  
3 skim of these documents and then give them to  
4 you, then I have to say, if they go out, they  
5 are going to have to be given back to us.

6 Document control is a really big  
7 issue for us, and we have to ensure that  
8 documents that are being made available to  
9 members of the public have the appropriate  
10 disclaimer language on them, headers, footers,  
11 so that anybody who looks at those documents  
12 later on, whether it be a staff person or a  
13 member of the public, can be aware of whether  
14 or not those documents have been reviewed,  
15 that they are pre-decisional in nature.

16 So I guess I would just -- You  
17 know, obviously, there are some things that we  
18 need to work on about this process, but if we  
19 are able to make compromises like what Larry  
20 has just spoken about, then there's going to  
21 be some other compromises like not being able  
22 to take notes or not being able to keep the

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1 documents. Hopefully, we can not have this  
2 problem in the future, but there is a short  
3 turnaround often.

4 MR. ELLIOTT: I think the  
5 compromise has value, though, because it  
6 enables the people who are sitting in this  
7 room to at least understand what is being  
8 discussed and can refer to the written page.  
9 So I'm in favor just to strive to get these  
10 releasable and, if we can't achieve that, then  
11 we should be able to share what we can share  
12 with the understanding that it is a compromise  
13 situation.

14 MR. KATZ: I agree. As DFO, I just  
15 can say in the future -- What happened this  
16 morning is that we had decided the discussion  
17 while Emily is racing through trying to review  
18 the document, and we didn't have any extra  
19 copies and so on, and by the time we were done  
20 with that, the discussion is pretty much done,  
21 and it is not much of assistance to the rest  
22 of you.

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1 I apologize for that, too, but in  
2 the future going forward, certainly, we can  
3 sort of practice -- If we know we are coming  
4 to a meeting and the Privacy Act review, the  
5 formal Privacy Act review, hasn't been  
6 completed on a document, we can try to do that  
7 for the preliminary scan before the meeting  
8 starts.

9 If it is a big document, it is not  
10 going to work, but for a short document like  
11 we had today, if I had it, we could have done  
12 it. We could have done it.

13 CHAIR CLAWSON: The Fernald?

14 MR. KATZ: Yes, the document  
15 presented.

16 CHAIR CLAWSON: The smaller matrix.

17 MEMBER ZIEMER: The other thing to  
18 keep in mind is many of our Work Group  
19 meetings get scheduled in advance in  
20 anticipation of documents. For example, we  
21 have a work group on November 10th whose  
22 deliberations are based on the assumption that

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1 certain documents will be forthcoming from  
2 NIOSH by October 30th, but if that date slips  
3 a little bit, and it could for any variety of  
4 reasons, then suddenly we are pressed for time  
5 both for the work group and then for the  
6 Privacy review.

7 One of the options then is you  
8 reschedule the meeting. That is sort of one  
9 of the realities. Many of the Work Groups  
10 schedule based on when they anticipate being  
11 available.

12 CHAIR CLAWSON: Well, we are trying  
13 to be proactive in it, and also, too, last  
14 night was the first time I was able to look at  
15 the small one. John had it all set up to be  
16 able to put it on the board and everything,  
17 and I says I don't think -- it hasn't been  
18 Privacy Act cleared.

19 So that put him scrambling to try  
20 to make copies and so forth, I guess. So we  
21 will keep this in mind. We apologize, and we  
22 know what kind of a situation -- It's like us

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1 trying to do something without a paper in  
2 front of us, too.

3 MS. BALDRIDGE: Two comments, the  
4 first being one of the disadvantages is that I  
5 don't know the format that is being followed,  
6 and I may interject and get things off  
7 schedule, bringing up topics that I am not  
8 aware are scheduled on down further in the  
9 proceeding.

10 CHAIR CLAWSON: Right.

11 MS. BALDRIDGE: And secondly, about  
12 forthcoming documents, I have a question for  
13 Mr. Elliott.

14 At our October meeting last year,  
15 you made a point of telling us that a draft  
16 for a portion of the site profile was pending  
17 and potentially available in a three-week  
18 window, which would have put it into November  
19 of last year. I believe that was on the  
20 environmental portion of the site profile that  
21 was being revised.

22 I was wondering what's happened.

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1           MR. ROLFES: The only thing I can  
2 think of is that there could have been a  
3 portion, like a white paper, that was  
4 produced. I don't have any recollection of us  
5 actively revising --

6           MS. BALDRIDGE: I'm referring to  
7 the notes.

8           MR. ROLFES: Okay. We can take a  
9 look back in the transcripts.

10          MR. ELLIOTT: Let us look and see  
11 what we were discussing at that time. It may  
12 have been a draft. It may have been in the  
13 works. May not ever have been finalized. We  
14 don't share draft documents until we ourselves  
15 have --

16          MS. BALDRIDGE: I think there was  
17 an inquiry, and you gave a reassuring word  
18 that, you know, what they were asking for was  
19 potentially only three weeks away, at least in  
20 draft form.

21          CHAIR CLAWSON: And that was to the  
22 TBD?

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1 MS. BALDRIDGE: I believe so.

2 MR. ROLFES: It could have been a  
3 component of our site profile that was pulled  
4 out of the site profile as a white paper, and  
5 will be incorporated into the site profile.

6 MS. BALDRIDGE: I believe that was  
7 maybe the 24th -- the October 24th meeting  
8 last year.

9 MR. ELLIOTT: I will check on that,  
10 and I will let you know.

11 MS. BALDRIDGE: Sure. Great.

12 CHAIR CLAWSON: Okay. With that,  
13 we will turn back to John.

14 MR. MAURO: I guess where I am  
15 right now is looking for some direction from  
16 the Work Group regarding the work plan,  
17 whether or not we hold off until we get  
18 further direction in light of the thinking or  
19 should we move forward?

20 CHAIR CLAWSON: John, you know,  
21 I've been sitting here listening to this  
22 communication back and forth a little bit.

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1 Explain to me on the HIS database, are we  
2 going to be able to pull this up, plant  
3 building by building?

4 MR. MAURO: I am going to introduce  
5 Bob Barton. Bob, could you come up and --  
6 I'll give the quick answer, and then you can  
7 tell a little bit more.

8 For the last several days, Bob has  
9 been diving into the database, and my  
10 understanding is we are having some trouble  
11 linking people with plants, but Bob feels that  
12 we might have found a way to get through it  
13 indirectly.

14 Maybe you could explain. In other  
15 words, making this matrix essentially links  
16 people, job category, with plant, with time  
17 period, and be able to do that.

18 It turns out that one of the  
19 problems we are encountering is linking the  
20 person at a given time period with the plant.

21 I think you said it looks like you are on the  
22 track of finding a solution.

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1 CHAIR CLAWSON: You can come up  
2 here.

3 MR. BARTON: As John said, my name  
4 is Bob Barton. I've spent a couple of days  
5 looking at the HIS-20 database.

6 Basically, what we have been able  
7 to do so far is match claimant Social Security  
8 numbers to breathing zone data. Now there are  
9 approximately, I want to say, maybe 3500  
10 workers in that breathing zone file, and so  
11 far we haven't been able to match a  
12 significant number of claimant Social Security  
13 numbers to the Social Security numbers  
14 contained in the breathing zone file.

15 The problem, as I see it, is going  
16 to be getting the claimants matched up with a  
17 particular building that they worked in. As I  
18 see it, in the HIS-20 there is actually only  
19 two of the spreadsheets that make any mention  
20 of the building, and as I said, we have only  
21 looked -- we have only been able to -- we have  
22 only matched up one of those spreadsheets.

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1                   What we have so far is about 48  
2 matches, which doesn't get us all that far.  
3 But again, I think the biggest roadblock we  
4 have in undertaking this is matching people up  
5 to the building they worked in.

6                   MEMBER ZIEMER: So do you look at  
7 the individual's file, the actual claim file  
8 where they -- I mean, what do they indicate  
9 about when and where they worked or does it  
10 come out in the CADY interview?

11                  MR. BARTON: Oftentimes in the CADY  
12 interview there will be some mention of what  
13 buildings they worked in. I wouldn't say that  
14 is the majority of times. A lot of the times  
15 it is family that is being interviewed, and  
16 they don't necessarily know that information.

17                  In the DOE dose records for the  
18 site that I have looked at, I have not seen  
19 any mention of particular buildings.

20                  MR. ROLFES: If you take a look in  
21 the DOE response files, there are codes that  
22 are provided next to the bioassay sample

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1 typically, and some of them are very easy to  
2 track which plant the individual worked in.  
3 Others aren't as clear.

4 I believe in HIS-20 as well there  
5 are some older codes for buildings at Fernald,  
6 and it isn't as straightforward as this  
7 individual worked in Plant 7. They gave like  
8 a number, like 1045 or something, for a  
9 building, and that would have to be decoded as  
10 whatever plant. So that might be a way.

11 MR. BARTON: That is certainly  
12 information that will help us.

13 MEMBER GRIFFON: There is a column  
14 of plant IDs, and that's the one? Do you have  
15 -- I mean, do you have a listing of those  
16 plant IDs, a key? Someone must have that.

17 MR. BARTON: Something I have  
18 noticed with the plant IDs, though, is it  
19 seems as if every single worker has an  
20 individual plant ID. So I don't know if that  
21 is actually tied to a particular building on  
22 the site.

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1 I would tend to say, looking at it,  
2 since they all seem to be individual plant  
3 IDs, I don't think they are tied.

4 MEMBER GRIFFON: Somebody on the  
5 line was trying to say something.

6 MR. CHMELYNSKI: This is Harry  
7 Chmelynski. I had the same question that Bob  
8 just asked.

9 MR. MAURO: Well, I guess we are at  
10 a point in this process where that, in effect,  
11 I started a discussion related to issue number  
12 1, having to do with uranium bioassay data and  
13 its use in dose reconstruction.

14 This first step was completeness.  
15 The reason I started with completeness is  
16 because I guess that is a fundamental issue.  
17 If we could walk away saying, yes, the data  
18 are basically complete, then all of a sudden  
19 everything falls off pretty easily.

20 Then we could talk about recycled  
21 uranium. We could talk about -- and the  
22 plutonium levels. We could talk about

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1 enriched uranium, because all of those hooks  
2 to deal with dose reconstruction for RU and  
3 for enriched uranium would require the  
4 milligram per liter number as your starting  
5 point.

6           So let's first -- I was hoping that  
7 we would agree, after we get through this  
8 completeness issue and, yes, we agree that  
9 this is a good way to get a sense that we've  
10 got a complete data that we could hang our hat  
11 on, then we could -- but it sounds like that  
12 we sort of got stopped at this stage.

13           What we can do is put that on ice  
14 right now. I mean this issue of the  
15 completeness analysis, whether you would like  
16 us to go forward with this or something else,  
17 and move on to the other issues related to  
18 internal dosimetry and bioassay data.

19           MEMBER GRIFFON: No. I think we  
20 need to --

21           MEMBER ZIEMER: I think, though, we  
22 need to answer the question of can you

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1 actually do that by plant or do you have to go  
2 by job category only or instead?

3 It sounds like there is a  
4 possibility that, practically, you may not be  
5 able to do that. And if not, what would you  
6 propose as an alternative? Is it job  
7 category?

8 MR. MAURO: I don't have an answer  
9 yet.

10 MEMBER ZIEMER: That was sort of a  
11 rhetorical question.

12 MR. MAURO: What we are basically  
13 working at is real time work. As we said, we  
14 only started about a week ago, and the first  
15 thing is, okay, is it tractable? Then let's  
16 dive in, and we are finding that there are  
17 some challenges.

18 Now we just heard that there may be  
19 a way to link people's Social Security numbers  
20 with building, maybe not. I'm not sure. If  
21 we can, then we have something that we could -  
22 - and we could do this thing here.

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1           Now that may be a showstopper. It  
2 may turn out we can't do it. Now we don't  
3 know yet. So the answer is that -- But I  
4 guess the bigger question is, even if we could  
5 do it, it sounds like we have a bigger  
6 question on the table, whether or not it is  
7 agreed amongst the Work Group that we should  
8 even try to do it.

9           MEMBER PRESLEY: That's my problem.  
10 I'm going to be honest. This is Bob Presley.  
11 Is there enough value added to do this at  
12 this point with the data that NIOSH has? Are  
13 we going to spend 200 hours and say, well, we  
14 are sorry, we didn't come up with anything or  
15 can we let you all work enough with Jim to  
16 where that SC&A can say, okay, we agree with  
17 NIOSH's data on this, and let's move forward?

18           MR. MAURO: Could I make a  
19 suggestion? I mean, this is just a  
20 suggestion. It sounds like there is enough of  
21 uncertainty regarding the value of this work  
22 and, as important, its doability because of

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1 the nature of the data.

2 Now this goes back to the question,  
3 okay, there is a data completeness, data  
4 validation issue that goes to the heart of an  
5 SEC, and it has been our experience that  
6 sampling data in the database as a way to get  
7 a sense of whether or not you could build co-  
8 worker models, what those co-worker models  
9 might look like, whether or not you could do  
10 dose reconstruction for each category of  
11 worker, each time period.

12 These are fundamental questions at  
13 SEC. I think that perhaps, in light of the  
14 fact that there is a co-worker model out there  
15 now, and there is some question of whether or  
16 not we could actually do this, maybe it is  
17 time to regroup and say let's stop the presses  
18 on this, regroup, maybe have one of those  
19 teleconferences with members of the Work Group  
20 to rethink this.

21 That could be -- we will have to  
22 look at the co-worker model and give some

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1 thought to it, talk to Mark. Now that -- We  
2 are pretty familiar with the HIS database, now  
3 that we've built in at least initially what is  
4 there. Perhaps we could construct something  
5 different or new that might be --

6 Mark, really, you know, I feel as  
7 if I'm stepping into your territory.

8 MEMBER GRIFFON: No, no. I just  
9 thought -- We had a little discussion during  
10 the break of maybe a sort of, I guess, a  
11 stepwise approach to this, that we -- because  
12 there is a co-worker model on the table now.

13 When we initially started this  
14 task, there wasn't. It was in development,  
15 and it did come out, but this has been quite a  
16 lengthy process. But my feeling was let's go  
17 forward with the sampling focus on what we  
18 believe -- and that's a question, too; that's  
19 a little subjective, too, but we believe would  
20 have been the higher exposed workers by, I  
21 guess, job type, is what we got to go by.

22 You know, the plant question -- The

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1 plant problem is a problem, but I would say  
2 almost that we could start a sampling by a  
3 time period, by job type, and then backfill  
4 and see what plants we covered.

5 We have done that with our DR  
6 sampling, you know. It is not the best way to  
7 do it, but if we can't sample by plant, we  
8 don't have the data.

9 I'm looking at this other table in  
10 HIS-20 where you talk about breathing zone  
11 sampling with building ID. The problem there  
12 is it starts in '97 or something. It D&D  
13 period. It is not -- So you are not likely to  
14 see a lot of links there.

15 So I think I would say start with  
16 what we think -- what we believe to be the  
17 higher exposed workers by job type, take a  
18 sampling, look at them in those certain time  
19 periods, come back, report on that, and then  
20 we can compare that against -- juxtapose that  
21 against the co-worker model and say, okay, it  
22 looks as if they did sample the highest

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1 exposed and, therefore, this co-worker -- you  
2 know, when there is inadequacies, we know now  
3 that they are going to use their co-worker  
4 model in those places, and is or is not that  
5 approach -- We can have that discussion.

6 So I think that would be -- and  
7 that is a stepwise approach to, instead of  
8 sampling all the job categories. I agree with  
9 Jim. I don't want to just throw money at the  
10 project. Let's do this in a sort of stepwise  
11 approach.

12 The difference, I think, at the  
13 start, like I said before, is that we didn't -  
14 - I had the understanding that there was a co-  
15 worker model under development, and I know  
16 it's been out there a while, and that it was  
17 also only going to be used in rare cases where  
18 they had little -- It's even stated in the  
19 minutes there that John compiled for this  
20 task.

21 It says that, you know, basically,  
22 it will only be used in those few cases that

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1 are missing bioassay data. So it left me the  
2 impression that that was going to be the  
3 exception rather than the rule, if it is going  
4 to be used -- If it is much more of an  
5 overlap, then I think we can judge it this  
6 way.

7 We can look at the higher exposed  
8 workers for data completeness. If, in fact,  
9 we find that it is pretty complete and it is  
10 in agreement with the co-worker approach, then  
11 I think we can put this to bed now.

12 CHAIR CLAWSON: I also feel, you  
13 know, we still -- The petitioners, we still  
14 owe them, because there has been questions  
15 raised about completeness of the data, and  
16 this is what I was trying to come to a point  
17 with.

18 There have been questions about the  
19 air sampling data and everything else like  
20 that, and this is what I was trying to put to  
21 bed up front and go from there.

22 I would still like to proceed on.

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1 How we do it -- you know, that can be up to  
2 us, if you want to go for the higher set or  
3 whatever, but somehow, to me, I would still  
4 want to be able to check this data.

5 MEMBER ZIEMER: I wouldn't object  
6 to a stepwise approach, as Mark described,  
7 which would allow us maybe to stop if we  
8 needed to.

9 MEMBER GRIFFON: To come back and  
10 reassess.

11 MEMBER ZIEMER: It would also  
12 answer the question as to how well you could  
13 do this. But the other thing is I think,  
14 before we make a final decision on this, I  
15 think in fairness the petitioners need to have  
16 this information and have input on it,  
17 including Hans' stuff.

18 MEMBER GRIFFON: I think they might  
19 have a lot of input as to what job categories.

20 MEMBER ZIEMER: And be informed how  
21 you proceed with this.

22 MEMBER GRIFFON: I agree. I agree.

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1                   MEMBER ZIEMER: And so I would like  
2 to see us delay our final decision on doing a  
3 full fledged thing, but maybe allow a first  
4 step, if the petitioners would agree to that,  
5 that would allow us to determine whether  
6 sampling would, in fact -- I don't know.

7                   The first steps might be some  
8 examination of that data that was described by  
9 Bob or something like that, which would give  
10 us the option, if we recognize that that  
11 wasn't going to be fruitful, to say, well, we  
12 don't want to pursue this any further.

13                  CHAIR CLAWSON: Yes.

14                  MS. BALDRIDGE: Just a reminder.  
15 The petition contains historical documents  
16 from National Lead of Ohio that said they knew  
17 what the assignments were, but they didn't  
18 know where the men were working or what tasks  
19 they were performing.

20                  When the bookkeepers were --  
21 recordkeepers were asked, they said there were  
22 only 2.6 pieces of data per worker per year.

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1 This, I believe, was in a 1982 or '84 inquiry  
2 by the Department of Energy possibly.

3 CHAIR CLAWSON: Ray?

4 MR. BEATTY: Yes. I agree with Dr.  
5 Ziemer there as far as getting some worker  
6 input. We have done some of this in the past  
7 in various interviews. Matter of fact, we met  
8 with NIOSH representatives from the metal  
9 trades department out of Washington, D.C.

10 Several union reps coming from  
11 across the country went to NIOSH to talk about  
12 the various things that occurred at the site  
13 and maybe what was missing, maybe even some of  
14 the CADY interviews, something that wasn't  
15 revealed but like, say, a widow or the sons  
16 and daughters of former workers wouldn't know  
17 those things, but the former workers would.

18 I would personally volunteer my  
19 time to sit down with SC&A or NIOSH to help  
20 out as far, well, co-worker model data and how  
21 it related, at least in remediation years.

22 I think you could get a feel for

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1 how, especially in a maintenance division --  
2 In those early years, people were assigned to  
3 a building for security reasons, while on  
4 overtime they may have to go to another  
5 building. Now that was mostly maintenance  
6 and transportation.

7           Chemical workers pretty much stayed  
8 within their own realm of responsibility in a  
9 specific building, and trying to connect into  
10 that building -- that might be a little  
11 easier. But I do know that other divisions or  
12 other groups and classifications were bounced  
13 around, but I do see the value of this  
14 information as it relates to trying to do a  
15 connection and assigning dose.

16           I do have a question. I don't know  
17 who this is for. Someone, try to tell me when  
18 HIS-20 come about, because I worked under HIS-  
19 20.

20           MR. NETON: I worked on HIS-20 when  
21 I was there.

22           MR. BEATTY: Okay. My question has

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1       been answered, and I know the time frame now,  
2       roughly in the late Eighties.

3                   MR. NETON;    HIS-20 was backloaded  
4       with the historical --

5                   MR. BEATTY:  Well, and that is what  
6       I want to allude to.  I am kind of questioning  
7       the reliability of that back data that was  
8       downloaded into this HIS-20, because we have  
9       challenged that in the past as labor  
10      representatives and with the federal court  
11      over it.

12                   So there lies a problem, I think,  
13      with maybe some of the HIS-20 data.  We worked  
14      under it in a scanning process out there with  
15      our badges.  So when we entered a building,  
16      our specific ID number, our badge number, was  
17      entered into the HIS-20 database as an entry  
18      time, and when we exposed a certain length of  
19      time -- very valuable information.

20                   I just kind of challenge, though,  
21      the fact of the old data being used as to the  
22      reliability of that data.

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1           MR. ROLFES: I think that was an  
2 important point, Ray. I think we did -- We  
3 were asked by the Advisory Board to take a  
4 look at that, and we have provided our  
5 analysis of the hard copy data to the  
6 electronic data that was back-entered.

7           MR. BEATTY: And even a NIOSH study  
8 revealed some shortcomings of using HIS-20 as  
9 it related to trying to assign medical dose --  
10 or dose and medical records and training  
11 records to the workforces. There was a  
12 problem of trying to accomplish that task.

13           CHAIR CLAWSON: Paul?

14           MEMBER ZIEMER: Yes, and Ray, I  
15 wasn't necessarily suggesting additional  
16 interviews, but more making sure that the  
17 petitioners have this information. I think  
18 several of you here could help inform us on  
19 these documents, based on your own knowledge  
20 as to whether the approach made sense.

21                    You mentioned, for example, workers  
22 are assigned to a particular plant but

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1 overtime may be somewhere else. That kind of  
2 information might be helpful as we make a  
3 decision on this.

4 So I was just suggesting that we  
5 not finalize this sort of approach until we  
6 have some input. In fairness, unless they  
7 have the papers, they can't really inform us  
8 very well.

9 MS. BALDRIDGE: There was a recent  
10 meeting last Wednesday that NIOSH, I believe,  
11 sponsored at the Fernald site, and I had the  
12 opportunity to meet people that I had not  
13 spoken with previously, and I don't know how  
14 many said, yes, they did a site profile, but  
15 they didn't have that Dad worked in 8 or they  
16 had missed me in Plant 4.

17 The frustration is that once the  
18 dose reconstruction goes to the DOL, you  
19 cannot get it corrected. I mean, you may as  
20 well talk until you are purple. They will not  
21 listen to you. They will not acknowledge the  
22 documentation that is sent to even prove

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1 anything contrary to what has been submitted  
2 with the dose reconstruction.

3 CHAIR CLAWSON: Okay. So, Bob  
4 Presley.

5 MEMBER PRESLEY: One of the things  
6 that I would like to see Ray do and some of  
7 the people that work up there is the list that  
8 you have here. I'm going to be honest with  
9 you. I don't see a foundry worker on this  
10 thing. I don't see chemical workers on this  
11 thing.

12 Those are two that I personally  
13 know probably got very, very high doses,  
14 especially in the early years. So you know, I  
15 would like to see you all do some work with  
16 them to get a little bit better list of who we  
17 think got the highest exposure.

18 MR. MORRIS: Well, there is, I  
19 would think, helpers and such job  
20 classifications.

21 CHAIR CLAWSON: And also it is like  
22 every other site we've got into. We've got a

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1 sub-group of all of those that are basically  
2 roving people that go everywhere. That is  
3 something we've got into in almost every site  
4 here, your laborers and, as we have said, the  
5 laundry and so forth like that.

6 We are going to have a group that  
7 is the most highest exposed. I think we need  
8 to be able to look at that. So I guess at  
9 this point, John, from what I am getting a  
10 feel from everybody and what the comments have  
11 had, and Ray has expressed a desire and so  
12 forth to be able to help with it, maybe if we  
13 are not going to be able to do it by plant or  
14 whatever, maybe we need to change this to  
15 highest exposed, get a better grasp of the  
16 classes that would be involved in that, and  
17 then go from there.

18 Would this be a problem?

19 MR. MAURO: No. I mean, what we  
20 would do, we would regroup. I would very much  
21 like to work with Mark on your -- It sounds  
22 like that the orientation would be worker

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1 category and highest exposed workers as it  
2 relates to your co-worker model as being the  
3 sampling plan, the thrust of the sampling  
4 plan, as opposed to the way it is laid out  
5 here.

6 MEMBER ZIEMER: Perhaps.

7 MR. MAURO: Perhaps, yes. I guess  
8 it is a probing. Really, what I am hearing is  
9 -- and correct me if I'm wrong -- you would  
10 like SC&A to probe this issue further, working  
11 with the Work Group and working with NIOSH on  
12 how would we shift perhaps the emphasis on the  
13 sampling plan in a different direction.

14 That might deal with the issue you  
15 just brought up regarding the categories of  
16 workers, the issue that Jim brought up  
17 regarding the co-worker model, and get away  
18 from, I guess, the idea of completeness by  
19 strata, because that was the theme here,  
20 completeness by strata, creating the strata  
21 that we thought were meaningful and then  
22 determining percent completeness of the

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1 dataset.

2 It sounds like that is not going to  
3 be as valuable as this other strategy. If we  
4 a -- Give us a week to probe it a bit. Bob  
5 has been looking at the database. Bob,  
6 working together with Mark and our folks,  
7 maybe we could come up with a new strategy  
8 that we could communicate in an e-mail to the  
9 Work Group who have a different strategy and  
10 get some feedback.

11 So I don't think we are talking  
12 about a large burden, a large delay. This is  
13 good. If it turns out we are going down the  
14 wrong path, fine. We will shift direction.  
15 So if that is okay with the Work Group --  
16 Certainly, I want to make sure that --

17 MEMBER GRIFFON; I don't see it as  
18 a completely different approach. I see it  
19 more as a stepwise, but probing to see if it  
20 is doable is a first step.

21 MR. MAURO: The idea of  
22 completeness by these strata -- sounds like

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1 that is an old concept that perhaps we should  
2 move away from. I'm not sure, you know.

3 MEMBER GRIFFON: I'm not sure that  
4 -- I mean, I think that what you want to do is  
5 look at people with the highest exposure and  
6 see if they were monitored adequately. Right?

7 If you want to call that completeness or not,  
8 I don't know, but we are focusing on that high  
9 end group instead of all groups right now.

10 MR. MAURO: I understand.

11 CHAIR CLAWSON: We've still got to  
12 have a completeness.

13 MEMBER GRIFFON: And don't forget -  
14 - not to throw a monkey wrench in all this,  
15 but the data completeness review -- if you  
16 look down, I think, in the next -- it might be  
17 listed in a different place, but it was also  
18 to look at external dose completeness.

19 MR. MAURO: Oh, yes.

20 MEMBER GRIFFON: And beyond '68 or  
21 whatever it is. So there's two other parts of  
22 that.

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1                   MR. MAURO: I only -- I was talking  
2 milligrams per liter, but yes, the other data  
3 would be there, too. All the data would be  
4 there.

5                   MS. BALDRIDGE: Putting people in  
6 lists, categorizing them -- I know they can't  
7 -- You can't just use one category to  
8 determine what their dose was, because they  
9 were stepping out of that role or they worked  
10 in production, and then they moved into  
11 machining, and then they moved into something  
12 else, and the records don't necessarily show  
13 that.

14                   So to say -- Who has determined the  
15 model to say that inspectors have the least  
16 amount of exposure or that another group of  
17 workers had an exposure greater than someone  
18 else, when they are crossing those boundaries?

19                   MR. ROLFES: That is true, but the  
20 bioassay results would have integrated all  
21 previous exposures and be reflected in a  
22 person's urine.

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1 MS. BALDRIDGE: That is assuming  
2 that the people who were examined -- that  
3 their data was accurate. Now in my father's  
4 case, it was not included in his dose  
5 reconstruction that he had worked Production  
6 before Plant 6 was in operation. He was not  
7 dosed for UF-6 which resulted in the renal  
8 damage, which that issue is still kind of  
9 floating around and how renal damage causes a  
10 retention of salts which may affect the  
11 excretion levels in the uranium analysis.

12 Those issues have not been  
13 addressed and established in such a way as to  
14 validate the use of the uranium urinalysis in  
15 100 percent of the cases.

16 When I asked you if you could  
17 distinguish which workers potentially had  
18 renal damage whose results could have been  
19 compromised because of it, you said you don't  
20 know. That's not in their records.

21 So do you go back and look to see  
22 who might have been exposed to something that

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1 could have caused renal damage and question  
2 the validity of their uranium urinalysis? I  
3 mean, this process -- you know, the little bit  
4 of research that was presented in the document  
5 covered two people in China, each of whom had  
6 one exposure.

7           You have people who are working day  
8 after day after day in an exposure level, and  
9 there is no data, there is no research, there  
10 has been no study to determine what effect  
11 that has had on their --

12           MR. ROLFES; I think we presented  
13 at a previous Working Group meeting that there  
14 were autopsy studies for people that were  
15 highly exposed in the uranium production  
16 facilities. That was the important thing that  
17 was of concern for uranium exposures in  
18 general across the United States at the DOE  
19 facilities.

20           There were several studies that  
21 were done. I don't have them right in front  
22 of me. I've got them somewhere in my box of

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1 records here, but that was one of their  
2 concerns, to determine how much uranium was  
3 being retained within an individual's body  
4 after chronic exposure.

5 There were some individuals that  
6 had excreted -- I think some of them were up  
7 near 100 milligrams of uranium in urine over  
8 their working history.

9 There were kidney sections taken  
10 and also tissue samples taken of some former  
11 workers to determine if they could discern  
12 whether this individual had renal impairment  
13 or kidney damage based on the chronic  
14 exposures, and they were unable to determine  
15 which individuals had been exposed to uranium  
16 versus those that had not been.

17 So it basically found that there  
18 was no differences from the normal population  
19 for those individuals who were exposed to  
20 uranium versus those who were not.

21 MS. BALDRIDGE: Well, the study  
22 they did with 17 men at Fernald, and all 17

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1 had renal damage. My father wasn't one of  
2 those 17, and who knows how many other men  
3 were damaged that were not included in the  
4 preliminary determination that that event had  
5 even occurred.

6 When I spoke to the researcher, he  
7 didn't even know that there was a group as  
8 large as 17 people to search out the  
9 documentation for the study.

10 MR. MAURO: I might be -- During  
11 the last Work Group meeting -- It turns out,  
12 in preparing for this, I very carefully read  
13 the transcript, and in my write-up I could  
14 actually read to you where we came out at the  
15 last meeting, because a great deal of  
16 discussion was held on that subject. Let me  
17 just read it to you, in response to this  
18 concern, which had a lot of discussion.

19 "NIOSH indicated that reports  
20 addressing these incidents" -- these were the  
21 17 incidents -- "were placed on the O: Drive.  
22 Further discussion was held regarding the

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1 group of 17 workers that were exposed to high  
2 levels of UF-6 at Fernald pilot plant in  
3 August 1966."

4 So there was some discussion here.

5 Anyone who wants it can go into the record.  
6 It is there. Bottom line, though, is NIOSH  
7 stated that follow-up investigations of the  
8 urinary excretion patterns of these workers  
9 did not reveal any unusual excretion patterns,  
10 excretion patterns meaning the highest  
11 excretions were on the first day post-  
12 exposure. That what would be normally  
13 expected as opposed to delayed.

14 Then there was almost another layer  
15 of discussion. It's all in the transcript. I  
16 don't know if the transcript has been posted  
17 yet, but I have privilege to it because I was  
18 given it in advance, so I could do this. Let  
19 me read this.

20 "In an effort to further address  
21 this issue, the transuranic registry was  
22 discussed and the degree to which autopsy data

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1 revealed kidney damage experienced by workers  
2 in the registry."

3 So apparently that was a subject of  
4 great interest in the transuranic registry.

5 "NIOSH cited a specific paper on  
6 this topic where no such damage was observed.

7 The paper cited is 'Histological Kidney Study  
8 on Uranium and Non-Uranium Workers' in Health  
9 Physics, volume 70, Number 4, page 466."

10 Then there was a conclusionary  
11 statement, which I have in bold in my matrix  
12 that says: "THE WORKING GROUP CONCLUDED THAT  
13 NO FURTHER ACTION IS REQUIRED ON THIS  
14 PARTICULAR ISSUE EXCEPT THAT NIOSH WOULD  
15 DOCUMENT THAT WHEN A PERSON EXPERIENCED VERY  
16 HIGH EXPOSURES, THAT PERHAPS MIGHT BE  
17 INDICATIVE OF A POSSIBILITY OF KIDNEY DAMAGE,  
18 AND SPECIFICALLY LOOK AT THE BIOASSAY DATA  
19 WITH THIS PARTICULAR ISSUE IN MIND."

20 That is what came out of the last  
21 meeting. So that's where we are on this  
22 issue.

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1 MS. BALDRIDGE: I would like to  
2 make an addition. In that discussion, I also  
3 brought up the point that I had personally  
4 contacted and spoken with one of the authors  
5 of the document, and he felt that his  
6 conclusions had been misrepresented by a group  
7 that expounded on that in the development of  
8 this paper.

9 I had used one of the footnotes,  
10 the reference document, and checked with the  
11 researcher. So when people are taking  
12 research and they are misrepresenting it to  
13 present a position that supports their own, I  
14 think that is questionable.

15 MR. MAURO: We just went over one  
16 of the issues that I was planning on  
17 discussing right now, regarding the kidney  
18 damage issue and its effect. I guess I will  
19 just speak for SC&A.

20 The place where we are right now is  
21 no further investigation on this matter as a  
22 result of the previous direction we were

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1 given, and we have not taken any additional  
2 steps.

3 We are really now getting into the  
4 finer structure of issue number one dealing  
5 with uranium bioassay data. So we are into  
6 the matrix. We have sort of left -- The first  
7 subject was the sampling plan. Sounds like it  
8 is in my hands to work with you folks.

9 MEMBER GRIFFON: I think so, and  
10 the petitioner. To go back to Sandra's  
11 initial question, I don't think it is going to  
12 be -- It may not be perfect, but I think if we  
13 get SC&A to work with NIOSH but also with you  
14 guys, selection of the jobs that we think,  
15 like the highest exposed.

16 I know that is not a perfect way,  
17 because like you said, some people could have  
18 a certain job type and go many different  
19 places. But I think also you would probably  
20 have a sense of, at least during certain time  
21 periods, you know, that was a really dirty  
22 job, they were real high exposed, you know.

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1           So we might be able to at least get  
2           some of those job types in and start that  
3           process that way. I think, yes, we should  
4           move forward with that in that way.

5           MR. MAURO: Fine. So that is an  
6           action item. I'm writing this down in my  
7           notes as an action item for SC&A to follow up  
8           on refining as necessary the sampling plan,  
9           and we will do that and get back to the  
10          Working Group with an e-mail shortly after we  
11          have a chance to deliberate amongst all  
12          interested parties.

13          I presume this particular handout  
14          that I had that was not PA reviewed -- I  
15          presume a copy of this can be made available  
16          to Ms. Baldrige. It sounds like that is  
17          something --

18          MS. HOWELL: There are some things  
19          that need to be changed.

20          MR. MAURO: Well, I'm not saying  
21          now. I'm just saying that it would be helpful  
22          for all interested parties involved with the

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1 sampling plan to have this paper.

2 MEMBER ZIEMER: Only the first  
3 three pages of that, I think, are pertinent  
4 for what we are talking about. There is a  
5 page that instructs certain people to report  
6 to Medical for bioassay or something, and  
7 certainly, you are going to be redacting  
8 almost that whole page anyway, I would guess.

9 MS. HOWELL: I haven't seen it.

10 MEMBER ZIEMER: Well, the fifth  
11 page is a list of people who have been  
12 instructed to report to Medical for bioassay.  
13 That doesn't help us in any particular way.

14 MR. MAURO: What I guess is there  
15 is a package of material apparently that we  
16 will need to get to the claimants and other  
17 interested parties that relates to the  
18 sampling plan.

19 MEMBER ZIEMER: Right. The stuff  
20 you handed out, plus Hans' material.

21 MR. MAURO: Plus Hans'. What I  
22 will do is I will get that material into your

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1 hands, say this is what I believe to be the  
2 material, and then you can clear it and move  
3 it out.

4 MS. HOWELL: And this document, we  
5 will need to have some changes made.

6 MR. MAURO: That would be,  
7 certainly, another piece which is separate.  
8 So that is separate from the sampling plan.  
9 That more goes to the bigger picture. That is  
10 also the matrix.

11 MEMBER GRIFFON: I'm sorry. Just  
12 as a point of meaning protocol, in the past  
13 meetings I have been keeping the matrix  
14 updated. I just don't see that I added in  
15 that column on that first -- As you said, I  
16 added it in October 28th, and I added in --

17 MR. MAURO: Well, we have it right  
18 now.

19 MEMBER GRIFFON: Right. I'm  
20 working on it now. I think it's a Work Group  
21 responsibility, really, to manage the matrix  
22 going forward rather than NIOSH or SC&A. I

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1 think we should manage it, and I'll help Brad  
2 with that.

3 MR. MAURO: By the way, to a macro  
4 level different strategies are being used in  
5 different work groups to deal with this.

6 MEMBER ZIEMER: For example, the  
7 Procedures Work Group, Steve is actually  
8 handling the data, Steve from SC&A.

9 MR. MAURO: I am working with Steve  
10 Hedafeld.

11 MEMBER ZIEMER: And they are doing  
12 the entries.

13 MR. MAURO: But if this group --

14 MEMBER ZIEMER: At the request of  
15 the Chair of that work group.

16 MR. MAURO: Yes, yes, oh, yes, and  
17 that's fine.

18 CHAIR CLAWSON: Mark is helping me.

19 MR. MAURO: Okay. Anyway, as I  
20 said, I took it upon myself to write this big  
21 piece. It was done as much for myself as it  
22 is I thought it would be helpful to the group.

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1 But what I'm hearing is I guess the next  
2 phase of this is in your hands as well as  
3 SC&A's hands.

4 CHAIR CLAWSON: That is correct.

5 MR. MAURO: That's fine.

6 CHAIR CLAWSON: The path forward  
7 now is we've got to begin to sit down with the  
8 petitioners and so forth, the other interested  
9 parties, and set up this sampling plan. We  
10 are going to change a little bit of direction  
11 there.

12 We've got this other issue, but  
13 right now, according to my watch, it's about  
14 time for lunch. Is that correct or am I still  
15 on Mountain Time?

16 MEMBER ZIEMER: It is time for  
17 breakfast where you were.

18 CHAIR CLAWSON: Yes. So what I was  
19 going to suggest is that we could pick up with  
20 this right after lunch, and then be able to  
21 proceed on there, if that is all right with  
22 everybody. Don't want to miss lunch.

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1 MR. KATZ: Okay. So we are  
2 breaking for lunch.

3 CHAIR CLAWSON: Yes.

4 MR. KATZ: And we will resume at  
5 one o'clock.

6 CHAIR CLAWSON: Yes.

7 MR. KATZ: Thank you, everyone on  
8 the phone, and we will start back up at one.

9 (Whereupon, the above-entitled  
10 matter went off the record at 11:51 a.m.)  
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A F T E R N O O N   S E S S I O N

(1:02 p.m.)

MR. KATZ: Good afternoon. This is the Fernald Working Group, and we are starting back up again.

CHAIR CLAWSON: Okay. This is -- Appreciate everybody coming back in. I am going to turn the time back over to John.

I felt like -- Are we going to start with complete of one or --

MR. MAURO: No, no. We didn't even warm up to one yet. This is a macro issue related to one that really crosses all the data completeness issue.

We are really now going to get into 1, and the big picture. One is doing dose reconstruction to workers when you have to contend with some of the workers may have been

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1 exposed to enriched uranium. Some of them may  
2 have been exposed to recycled uranium. And  
3 there was also an issue related to data  
4 quality, related to transcription of the data  
5 from the original database, the hard copy, to  
6 the HIS-20 database.

7 So these are the issues that fall  
8 under number 4-1. So let me -- Let's first go  
9 to recycled uranium.

10 After reading the transcript -- and  
11 I tried to capture it as best I could in the  
12 matrix -- NIOSH's position is that the false  
13 assumption that all workers that worked with  
14 uranium worked with recycled uranium, and  
15 please correct me if I am misrepresenting what  
16 I believe was in the transcript.

17 It is going to be assumed that all  
18 workers, even beginning as early as in 1955,  
19 even though recycled uranium really didn't  
20 start, I guess, in any serious way being  
21 processed until the Sixties, and you are going  
22 to start saying all these milligram per liter

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1 uranium numbers that you have in bioassay --  
2 it is going to be assumed that accompanying  
3 data was 100 parts per billion of Plutonium-  
4 239 and the associated other radium --

5 MR. ROLFES: Correct.

6 MR. MAURO: -- in appropriate  
7 proportions as a default assumption.

8 That was the position. Now that  
9 was the position that was described at the  
10 last meeting.

11 The mission that was given to SC&A  
12 is to take a look at that and see if that  
13 seems to be a reasonable assumption to make as  
14 a bounding assumption.

15 Basically, what we did is we -- and  
16 if Hans Behling is on the phone -- Hans gave  
17 me some material to hand out. It is -- I  
18 guess it is a DOE report by a fellow named  
19 Bogart, and we have extracted certain pages  
20 from it that we looked at.

21 I would like to hand that out to  
22 everyone. I think I have 10 copies, and again

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1 it is not PA cleared, but it is material --  
2 not PA cleared. What I am going to do is just  
3 draw your attention to a particular page.

4 I will give you some of what I  
5 believe represents the SC&A perspective on  
6 this, but at that point I would like either  
7 Arjun or Hans to help me out a bit after  
8 everyone gets a copy.

9 What everyone is looking at is  
10 selected pages from this report referred to as  
11 the Bogart Report, which is a characterization  
12 of the recycled uranium that -- the various  
13 campaigns and the various materials that were  
14 sent to NIOSH for processing.

15 I would like to propose -- Just to  
16 move through this pretty quickly to see where  
17 we come out, I would like you to first go the  
18 -- I guess it's the -- starting with the  
19 first page, the third page that says "Recycled  
20 Feeds" as the title, and also has -- On the  
21 upper right hand corner it says Page 9.

22 What we are looking at are some

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1 data that represents -- The reason I bring  
2 this up is that, when you ask yourself, is 100  
3 parts per billion a good number -- and one of  
4 the questions that came up at the last meeting  
5 is, wait a minute, what about the Tower ash,  
6 because the 100 parts per billion -- The theme  
7 went like this. The 100 parts per billion  
8 appears to be a pretty good number to place an  
9 upper bound on exposure to recycled uranium,  
10 except for Paducah Tower ash, which was a  
11 special problem.

12 So I guess this first page we are  
13 looking at is some of the data showing the --  
14 I guess these were the different campaigns  
15 where ash from Paducah was sent, and what its  
16 -- If you go to the far righthand column; it's  
17 called plutonium parts per billion. Well,  
18 there is a uranium basis and sample basis.

19 I guess it's the uranium basis that  
20 we should be looking at from a parts per  
21 billion. You could see that there are a  
22 number of campaigns of processing that were

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1 well above 100.

2           So then we will get to the 100 in a  
3 minute, but the most important point that was  
4 being made -- Everyone, I think, around the  
5 table agrees that, yes, the Paducah ash was a  
6 special issue where the level of plutonium in  
7 the uranium, recycled uranium, was unusually  
8 high.

9           In this case, we could see it as  
10 high as 7,000 in one particular batch, and  
11 that overall the material that came in that  
12 was processed -- and this apparently occurred  
13 in about 1980. So it was a fairly well  
14 defined time period.

15           So to characterize NIOSH's position  
16 on this as best I can, is that, yes, there was  
17 elevated levels, well above 100 parts per  
18 billion, but it was confined to primarily --  
19 to entirely the tower ash that came in the  
20 1980s, and that -- So we know when it came in,  
21 where it came in, and we also know that when  
22 it was handled, people wore respirators, which

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1 had, I believe, a protection factor of at  
2 least about 50.

3 MR. ROLFES: They had airline  
4 respirators.

5 MR. MAURO: Airline. So it would  
6 be better than 50.

7 MR. ROLFES: Right.

8 MR. MAURO: Airline respirator will  
9 give you 1,000.

10 MR. ROLFES: Correct.

11 MR. MAURO: Good. I didn't get  
12 that. The point being, though, so by assuming  
13 everybody gets -- In other words, this does  
14 not defeat -- the argument being this does not  
15 defeat the assumption of 100, because if you  
16 apply a 100-fold or 1,000-fold decontamination  
17 factor to these numbers, you are well below  
18 100.

19 So NIOSH's position, as I  
20 understand it from reviewing the record, is  
21 that we could deal with this problem, and the  
22 100 parts per billion assumption looks -- you

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1 know, we could live with it, because we have a  
2 way to contain and manage the people who were  
3 exposed to tower ash because of you know when  
4 it came in, you know who handled it, and you  
5 also know that they were using respiratory  
6 protection. Yes?

7 MR. ROLFES: John, also  
8 furthermore, there are bioassay results for  
9 plutonium for the individuals that were  
10 involved in that.

11 MR. MAURO: On top of it all.  
12 Okay. So on that basis, it certainly sounds  
13 to be a reasonable approach to sort of  
14 bounding their problem.

15 Let's go to --

16 MR. RICH: John, this is Bryce  
17 Rich. Could I just add one note, having dealt  
18 with the recycled uranium issue for a long  
19 time, the tower ash was quickly blended, and  
20 the 100 parts per billion was driven by a  
21 blended value, and that was available to more  
22 than the initial people who handled the ash

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1       itself.

2                       So just to indicate to you that the  
3       100 parts per billion, when you consider a  
4       short exposure period and for the entire  
5       period at the site, 100 parts per billion is  
6       very, very conservative.

7                       MR. MAURO:    I understand, and we  
8       are going to discuss that a little bit, but  
9       with that said, I would like to jump to two  
10      more pages.    Just flip over.    On the top of  
11      the FA, you will see page 007.

12                      Now what this shows is the average  
13      parts per billion of plutonium in uranium by  
14      year from this same report.    You could see  
15      that in general what -- you know, you can look  
16      at it for that year.    Any year, 100 parts per  
17      billion overall would be certainly bounding by  
18      at least tenfold.

19                      Then, of course, you hit that 1980  
20      year.    You see you got 1,122.    That harkens  
21      back to the previous table.    So I mean, this  
22      page seems to support that, yes, there was

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1 something very unusual that occurred in 1980  
2 in dealing with tower ash, but when you get  
3 away from that particular year and the ash and  
4 you return to other forms of uranium, recycled  
5 uranium, in each year the numbers are well  
6 below 100 parts per billion.

7 So on first blush, the implication  
8 is it looks like your solution -- your  
9 approach to this problem is well in hand.  
10 However, in discussing this matter, the one  
11 issue that came up is -- Now let's look at,  
12 for example, -- Let's look at 1970.

13 We've got 1.2 million kilograms of  
14 uranium, total uranium that was processed, and  
15 the overall average for that was 3.964 parts  
16 per billion.

17 Is there any -- You know, what  
18 level of confidence do we have that some  
19 subset of that 1.2 million kilograms may not  
20 have been enriched above 100 parts per  
21 billion, where the idea of going back to it --  
22 we've talked about this before -- is it

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1 possible there may have been some people that  
2 were handling some subset of this large amount  
3 that could possibly have been above 100 parts  
4 per billion.

5           So it was like hidden within these  
6 averages, which are clearly by year well below  
7 100. is it possible that hidden within some  
8 of these averages are elevated levels? Is  
9 there something about the process whereby that  
10 -- I guess this is our question -- follow-up  
11 question to NIOSH, is that: You know, what  
12 level of assurance is there that some subset  
13 of this, other than perhaps the tower ash,  
14 might well have been above 100 parts per  
15 billion, some shipment from some other  
16 facility, maybe from Hanford or some other  
17 facility that might have been relatively small  
18 compared to the total amount that was  
19 processed in that year, but could have been  
20 above 100 and, therefore, in that year there  
21 might have been some people that could have  
22 been exposed to something well above 100 parts

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1 per billion.

2 I guess that is the question --  
3 SC&A's question back to NIOSH regarding this  
4 issue. Anything else?

5 MEMBER GRIFFON: Yes, maybe along  
6 the same lines, but a more fundamental  
7 question. Just how was that number in the  
8 final column there determined? Was it -- Did  
9 they assay every batch that came in or did  
10 they -- you know, is this an average of two  
11 sample points in the year or is this -- I  
12 don't know. I'm just asking.

13 MR. ROLFES: Bryce, this is Mark.  
14 I know for the recycled uranium report, that  
15 was certainly very well studied by the  
16 Department of Energy, certainly in recent  
17 years. Do we have more detailed information  
18 by year that has plutonium amounts in  
19 relationship to the uranium content of the  
20 shipments?

21 MR. RICH: This is Bryce. There  
22 are more detailed reports in the 2000 reports

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1 on recycled uranium to for my spot-on studies.

2 Also there are reports in the plant that were  
3 studied carefully from a process standpoint.

4 We were careful to make sure that -  
5 -Well, that's where the 100 parts per billion  
6 was bounding in the analysis that was done.

7 It is possible that for very short  
8 periods of time that some values were above  
9 100 parts per billion, particularly with the  
10 blending operation from the particular tower  
11 ash program, but those are very short in  
12 duration and well controlled.

13 Then other parts of the program,  
14 including -- well, the break-out of the metal  
15 production program, the magnesium fluoride  
16 that was recovered, and there were some  
17 concentrating points in the processes, but  
18 those have been carefully evaluated for  
19 maximum concentration, and that fell below the  
20 100 parts per billion, plus the fact that  
21 those process streams were relatively small in  
22 volume and had not -- and did not represent

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1 the major process load of the plant.

2 MEMBER GRIFFON: Is that an  
3 evaluation that you wrote up, Bryce, or is  
4 that--

5 MR. RICH: It is summarized in --

6 MR. KATZ: I am sorry. Can't hear.  
7 Bryce, is there someone in the background on  
8 your phone?

9 MR. RICH; No. That is not on my  
10 phone.

11 MR. KATZ: Okay. There is someone  
12 on the line who hasn't muted their phone. If  
13 you would, please, you are interfering with  
14 the person who is trying to speak right now.  
15 Someone is still talking right now. We are  
16 listening to someone talking on the line.  
17 Would you please mute your phone, Star-6.

18 I'm still hearing you. It's a  
19 woman speaking. Please, can you mute your  
20 phone.

21 MR. RICH; I can continue, if you  
22 like.

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1 MR. KATZ: Okay, why don't you  
2 continue, Bryce. You are much louder than  
3 she is, and it should work.

4 MR. RICH: I don't quite remember  
5 exactly where I was, other than to indicate  
6 that all of the available data at Fernald has  
7 been accumulated, and we are in the process  
8 of updating the test basis documents.

9 There has been some -- the OTIB 53  
10 is still -- well, if it has gone through our  
11 system, it is still in final review, but that  
12 has some additional references and information  
13 related to the generic process streams, of  
14 which Fernald played a very key role, because  
15 Fernald was one of the DOE sites that pretty  
16 well handled all of the process streams that  
17 you could call recycled uranium.

18 I would mention one other thing.  
19 That is that there were a number of periods in  
20 the Fernald process system where they  
21 processed uranium ore, and injected that as  
22 blending material into the process stream

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1 within the plant and, of course, that dilutes  
2 considerably.

3 The material that came from the  
4 generating site, primarily Hanford and  
5 Savannah River, were carefully monitored and  
6 documented. All of that material that came  
7 into the plant as primary recycled uranium was  
8 at five parts per billion or less.

9 They were working to a 10 part per  
10 billion maximum limit, and of course, we  
11 documented not only plutonium, neptunium and  
12 technetium as a primary recycled uranium  
13 contaminants, but the bounding levels of other  
14 contaminants as well, fission products like  
15 ruthenium and the like.

16 So there is a body of documentation  
17 that gives assurance that the choice of  
18 default contaminant levels is very  
19 conservative.

20 MR. MAURO: Bryce, a question that  
21 came up in some of our discussions is,  
22 certainly, the feed material, as you have

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1 pointed out, controls over what was shipped,  
2 but you had mentioned -- but there is also  
3 this -- once material arrives, there is some  
4 blending which would value it down. But, of  
5 course, there's also other aspects to the  
6 process, which was the concentrate.

7 Does part of the OTIB 53 report  
8 address some of the steps at Fernald where the  
9 potential for re-concentration existed?

10 MR. RICH: The potential for  
11 concentration at Fernald is dealt with in a  
12 separate paper. The steps associated with --  
13 you know, the likely concentration mechanisms,  
14 of course, have been -- you are trying to --  
15 you run it through the liquid extraction  
16 plant, in which point you are trying to purify  
17 the uranium.

18 At Fernald, the purification system  
19 was not "tuned," if you will put that in  
20 quotation marks, to the recycled contaminants,  
21 but more heavy metals and other contaminants  
22 that dealt more with the neutronics associated

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1 with the use of the recycled uranium further  
2 in the reactors, the raffinates being one of  
3 them, and we have satisfied ourselves from  
4 analyses at Fernald specifically that the --  
5 first of all, there was an amount of uranium  
6 in the raffinates that still bounded where the  
7 100 parts per billion was bounding, plus the  
8 fact that, of course, the operators who  
9 attended the raffinate system also attended  
10 other points in the process where the primary  
11 exposure was to uranium.

12 We feel like we've done an  
13 exhaustive study there, and are satisfied that  
14 the bounding will be very conservative.

15 MR. MAURO: Yes, I have nothing  
16 more to offer here.

17 MR. MAKHIJANI: John, can I make a  
18 comment?

19 MR. MAURO: Sure. Sure.

20 MR. MAKHIJANI: There is a page in  
21 the Bogart report that I failed to provide you  
22 with, and it does include the actual absolute

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1 quantities of plutonium content that were used  
2 as feed materials by year, and it really shows  
3 that in the year of 1980, which obviously, as  
4 you already pointed out, is a high point where  
5 the total number of grams of plutonium that  
6 were part of the feed material amounted to  
7 close to 26 grams.

8 That towers over all other years,  
9 according to this particular figure that I am  
10 looking at. The next closest one was 1970  
11 where the total number of plutonium in terms  
12 of grams were less than 6 grams.

13 So we are talking about a  
14 difference of 3.5 or close to fourfold  
15 difference between the peak year of 1980 that  
16 involved plutonium contaminated feed material  
17 versus the second next largest year of 1970  
18 where the quantity of plutonium went from  
19 nearly 26 grams to less than six grams.

20 So I believe that for that year --  
21 Obviously, that is a bounding value, but as I  
22 already pointed out, the 100 parts per billion

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1 would appear to, obviously, cover us for all  
2 other years as a bounding value, other than  
3 1980.

4 MR. RICH: Hans, if I could add  
5 just a little bit, we calculated, and it is  
6 well documented, that the relative small MAPs  
7 volume of tower ash that came from Paducah and  
8 a couple of other sites, in effect, doubled  
9 the amount of plutonium in the plant for a  
10 period of time until that worked its way  
11 through the system.

12 So in other words, when you were  
13 dealing with a normal input of five parts per  
14 million, the total quantity in grams of  
15 plutonium in the plant suddenly in that plant  
16 year did double. But what we have satisfied  
17 ourselves is that even in the year of 1980  
18 with the blending and the careful control,  
19 that the 100 parts per billion adequately  
20 provide a very conservative bounding.

21 MEMBER GRIFFON: Hey, Bryce, this  
22 is Mark Griffon. Earlier when we had the

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1 little interruption, I was asking: The  
2 evaluation you are talking about -- is that in  
3 this white paper that is on the O: Drive, this  
4 RU white paper?

5 MR. RICH: Mark, what evaluation  
6 are you referring to?

7 MEMBER GRIFFON: Well, your  
8 evaluation basically demonstrating that the  
9 100 parts per billion --

10 MR. RICH: Oh, yes. Yes, it is  
11 summarized, that information of which you are  
12 speaking.

13 MEMBER GRIFFON: Has SC&A reviewed  
14 that or just reviewed the source document? I  
15 don't know.

16 MR. MAURO: As far as I know, the  
17 only document we looked at was the one I just  
18 handed out. We did not go deeper.

19 MEMBER GRIFFON: Yes.

20 MR. ROLFES: The recycled uranium  
21 white paper was placed onto the O: Drive.  
22 Looks like there was one that was placed in

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1 March of 2008, it appears.

2 MEMBER GRIFFON: Is that -- that  
3 white paper, is that the predecessor to the  
4 TIB or, no, they are separate things? There's  
5 a TIB.

6 MR. MORRIS: The white paper was  
7 specialized at Fernald.

8 MEMBER GRIFFON: For Fernald.  
9 Okay.

10 MR. MORRIS: We have been hashing  
11 this back and forth for quite a few months  
12 now, and --

13 MR. RICH: Years.

14 MR. MORRIS: Years. Sorry, Bryce.  
15 I would say that there is probably not  
16 substantial differences that have come out  
17 over the years. There have been tune-ups.

18 MR. RICH: That is true, Bob. I  
19 would say that there have been a number of  
20 white papers dealing with the various topics  
21 that we have generated to address the Fernald  
22 issues, and -- well, Mark has a better idea of

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1 what has been placed on the O: Drive, but --

2 MEMBER GRIFFON: The only reason  
3 I'm asking is because I am thinking that SC&A  
4 -- to finally close this out, I think it might  
5 be worthwhile looking at that, but I'm  
6 wondering, if this had been revised in the  
7 TIB, you might want to just look at the latest  
8 thing, you know.

9 MR. RICH: Then there is not a TIB.  
10 There is a TIB that is in the final phases of  
11 review, which is OTIB 53, which deals with  
12 precisely uranium complex-wide.

13 MEMBER GRIFFON: So this has more  
14 Fernald specific information.

15 MR. RICH: Yes. There is a white  
16 paper that has been developed since.

17 MR. MORRIS: It would be a  
18 significant review effort to do a TIB 53. You  
19 may want to refocus on --

20 MEMBER GRIFFON; I think you want  
21 to focus on this white paper then, yes.

22 MR. ROLFES: This white paper is

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1 titled "White Paper: Dose Reconstruction  
2 Considerations For RU Contaminants at  
3 Fernald," and it is dated March --

4 MR. RICH: That sounds like it.

5 MEMBER GRIFFON: That's the title  
6 of the -- I was looking at the file name.

7 MR. ROLFES: The file name is RU  
8 White Paper 3308-Final Draft..

9 CHAIR CLAWSON: Hey, Bryce, this is  
10 Brad Clawson. Didn't we send some product out  
11 there, too, and it kind of didn't work very  
12 good, from Idaho?

13 MR. RICH: The recycled uranium  
14 came out of the Kent plant. There may have  
15 been a small quantity that went to Fernald,  
16 but they were very careful not to mix that  
17 material through INEL because of its very high  
18 enrichment, at 99 parts percent of it went to  
19 White Trail and directly to Savannah River to  
20 be used in -- as driver fuel, and there was a  
21 little bit that went to Rocky Flat and a  
22 little bit that went to Portsmouth. But I

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1 don't have any records that indicate that  
2 there were any substantive amounts that went  
3 to Fernald.

4 Fernald really could not handle the  
5 enrichment of the product from INEL.

6 CHAIR CLAWSON: I just remembered,  
7 we classified it as trash, but it had enriched  
8 -- smaller enrichment of uranium, and we were  
9 trying --

10 MR. RICH: There could have been a  
11 -- It would really had to have been lower  
12 enriched, Brad.

13 CHAIR CLAWSON: More like trigger  
14 fuel that we had worked with.

15 MR. RICH: And, frankly, that  
16 didn't show up on any of the inventory. So if  
17 it were, it was a minor quantity and possibly  
18 used for experimentation.

19 CHAIR CLAWSON: Okay.

20 MEMBER GRIFFON: Hey, Bryce, this  
21 is mark Griffon. I think we will end up  
22 asking SC&A to look at the white paper, but

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1 the first question I had -- or a little while  
2 ago I asked the question about the annual  
3 parts per billion, the average levels.

4 Do you have any sense of what they  
5 were derived from? Were all the batches in a  
6 year sampled or was this -- do you have any  
7 sense of that, how many samples went into --

8 MR. RICH; No, I don't have -- the  
9 information that I took came from the mass  
10 balance report at Fernald, and they extracted  
11 that information from plant data itself.

12 I did not go back and look at the  
13 data that was used by the DOE mass balance  
14 team at Fernald. I worked with them during  
15 the period of time that they were doing that  
16 study, and was satisfied that their work was  
17 comprehensive. but I can't tell you how many  
18 samples and how many per year and that.

19 I just know that there is a general  
20 knowledge base associated with what came in,  
21 even from the secondary shippers like, you  
22 know -- but the primary shippers, being

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1 Savannah River and Hanford, injected the  
2 contaminants into the system. But of course,  
3 the material that came from the secondary  
4 sources were -- carried an additional load of  
5 contaminants, which was accounted for also.

6 MR. MORRIS: On that topic, my  
7 sense of it is that nuclear materials control  
8 regulations would have specified the sample  
9 protocols, and also product specification  
10 drivers may have specified that.

11 MR. RICH: They were -- all of the  
12 plants were working to the 10-part per billion  
13 contamination limit, even on the secondary  
14 sites, with the notable exception of those  
15 where there was a concentrating mechanism,  
16 fundamentally and primarily in the diffusion  
17 enrichment program.

18 In those cases, they were quite  
19 conscious of the contamination concentration  
20 and, as a matter of fact, as a side note,  
21 Fernald objected to receiving the tower ash,  
22 but the amount of uranium during that period

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1 of time carried a value that they were  
2 directed, and consequently their concern level  
3 and the retention program associated with the  
4 receipt of that material were extraordinary.

5 MEMBER GRIFFON: And that is part  
6 of the reason I asked, because I also remember  
7 there was a discrepancy with the Paducah  
8 sampling of that tower ash versus the Fernald  
9 sampling, if I recall. The numbers were quite  
10 a bit different. That is something I remember  
11 during the Paducah mass balance reading.

12 MR. RICH: Yes.

13 MEMBER GRIFFON: So that is why I  
14 was asking about the sampling and the  
15 frequency.

16 MR. RICH: The sampling results  
17 that were used came from the Fernald sampling  
18 on receipt.

19 MR. MAURO: I wrote that as an  
20 action item.

21 MEMBER GRIFFON: The White Paper,  
22 yes.

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1 MR. MAURO: Okay. So I will get  
2 direction from the Board. Right now -- from  
3 the Work Group -- I have identified that we  
4 are going to track down that White Paper. I  
5 didn't get the full citation, but I will get  
6 in touch with you, and we will download it.

7 MEMBER GRIFFON: I guess with the  
8 focus, the clear focus, being on is the 150  
9 ppb.

10 MR. MAURO: Oh, yes.

11 MEMBER GRIFFON: You know,  
12 bounding, but also, I guess, I would look at  
13 the neptunium numbers and the other numbers  
14 for the other components.

15 MR. MAURO: The ratios.

16 MEMBER GRIFFON: It seems to me  
17 plutonium in this case is the more -- a higher  
18 dose consequence. I haven't looked at it. I  
19 don't know. I haven't had much of an  
20 opportunity, but it looks like plutonium.

21 MEMBER ZIEMER: Could you go ahead  
22 and give us that reference anyway? It was RU

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1 something?

2 MR. ROLFES: It was recycled  
3 uranium White Paper. It was RU White Paper.  
4 That is what it is listed under the O: Drive  
5 as. Let me log back in and confirm what I've  
6 said.

7 MR. KATZ: While we are a break  
8 sort of in discussion, just let me remind  
9 folks on the phone, please mute your phone if  
10 you are not speaking or Star-6. There was a  
11 lady earlier who took a phone call while we  
12 were trying to have a discussion, and  
13 interfered with about five minutes of  
14 discussion. So please, mute your phone or  
15 Star-6. Thanks.

16 MR. ROLFES: It is RU White Paper,  
17 and the date was 3/3/2008, and -- okay. It is  
18 ruwhitepaper3308\_finaldraft.doc.

19 MR. MAURO: Well, if I look for a  
20 RU White Paper, I'll find it. All right. I'm  
21 good.

22 CHAIR CLAWSON: Okay. Move on to

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1 the next.

2 MR. MAURO: Move on. We are still  
3 on uranium. Now we are on the issue of  
4 enrichment. In reviewing the transcripts from  
5 the last meeting, it was NIOSH's plan to  
6 assume that all individuals were -- the  
7 uranium they worked with was two percent  
8 enriched, starting in a given year. I forget  
9 the exact year. Then prior to that, it was  
10 one percent enriched, the feeling being that,  
11 though there is evidence that there may have  
12 been some campaigns where the enrichment could  
13 have been as high as five, seven or 19.9, if I  
14 remember, which is the upper limit, those  
15 campaigns were relatively short.

16 So that the way I understand it  
17 when you described it is I visualize this  
18 person who is working, doing his job. Moving  
19 through his responsibility might be some  
20 material that is above two percent, but if you  
21 look at the overall year that that person was  
22 working his job, my understanding is it is

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1 virtually impossible for his exposure to have  
2 been greater than two percent when you average  
3 it out over the total throughput that he  
4 handled that year.

5 Now your position with regard to  
6 that matter -- that is that, yes, there was  
7 some campaigns that were greater than two  
8 percent, but they were relatively small  
9 amounts. Any individual that might have  
10 worked on it would have been for a relatively  
11 brief period of time. Is that a fair  
12 characterization of how you came about your  
13 two percent as being bounding?

14 MR. ROLFES: The majority of the  
15 data that we have indicates that natural  
16 materials were processed in certain years.  
17 Depleted uranium was processed other years.  
18 Slightly enriched materials were processed.

19 The enrichment isn't typically  
20 given in some of these reports that you see.  
21 It just refers to the material as enriched  
22 uranium, and in other reports, though, it will

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1 actually say the enrichment, whether the air  
2 monitoring data will have enrichment.

3           There is reports that indicate that  
4 these three individuals worked on a special  
5 project involving alum sodium reactor fuel  
6 elements, dissolving the reactor elements. I  
7 think the enrichments of those elements were  
8 five percent and 6.5 percent.           There's  
9 actually corrections to the mobile in vivo  
10 radiation monitoring laboratory data for those  
11 individuals that show that the specific  
12 activity of the material that they were  
13 handling was different than the norm. So they  
14 made adjustments to the maximum permissible  
15 lung burden for the higher enrichments to  
16 ensure that the people didn't have greater  
17 than their control levels.

18           There is documentation of the  
19 different enrichments. The majority of the  
20 enrichments, as we have been discussing,  
21 enrichments that were handled were typically  
22 very low enrichments, slightly above natural

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1 uranium, and some of the common enrichments  
2 that were used at Fernald, for the Hanford  
3 pile and for the Savannah River site typically  
4 were less than two percent.

5 Some of the material that they  
6 received from those sites, slightly enriched,  
7 about .8 percent versus the .71 percent U-235  
8 content.

9 The two most common enrichments for  
10 Hanford, for example, that Fernald received  
11 were .947 percent and 1.25 percent. There was  
12 some 2.1 percent produced for the N reactor as  
13 well.

14 There is quite a bit of  
15 documentation on enrichments, and so I think  
16 what we've got --

17 MR. MORRIS: We do have interviews  
18 of people in charge of the blend-down process  
19 that you may be referring to that, when  
20 batches of -- small batches of products that  
21 would come in, they were immediately blended  
22 into a process stream at a certain point in

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1 order to, as they call, sweeten the  
2 enrichment.

3 It was always a planned operation.

4 It was a formulary that was done, and it  
5 would be a dilution of a few kilograms into a  
6 much, much larger volume with a known outcome  
7 that would come out at one of those pre-  
8 specified enrichments there.

9 MR. MAURO: When you folks  
10 described that to us during the last meeting,  
11 one of the things we were asked to do was to  
12 check -- I think there was a particular report  
13 by Dolan and Hill. I think that's one of the  
14 reports.

15 Hans had taken a look at it.  
16 Basically, I think where we have come away  
17 from this is that we absolutely understand and  
18 agree that on average assuming two percent for  
19 everybody is certainly an overarching  
20 conservative assumption. But we are asking  
21 ourselves the question: Is it possible -- I  
22 always come back to this circumstance. Is it

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1 possible for some relatively short period of  
2 time -- say one year, two years -- where a  
3 person comes in and he works for a couple --  
4 let's say we have a person that works there  
5 for 10 years.

6 In our mind, over that 10-year  
7 period, he is going to average out well below  
8 two percent enrichment. But we have a person  
9 who comes in, and say he just works there for  
10 a year, and he is brought in to handle a  
11 particular campaign, and it happens to be that  
12 person's job to work with the seven percent or  
13 five percent. I don't know if that happened  
14 or not.

15 So we were looking at the Dolan and  
16 Hill report from that perspective. Is there  
17 any information that will give us some level  
18 of assurance that that is unlikely that  
19 anyone, for a protracted period of time -- say  
20 a year or more -- came in, did that work, and  
21 then basically if we were to do his dose  
22 reconstruction based on his milligrams per

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1 liter, you could underestimate his dose?

2 It turns out -- and Hans, if you  
3 are on the line --

4 MR. BEHLING: Yes, John. Regarding  
5 the Dolan and Hill report, I did look at it,  
6 and there is very little, if any,  
7 quantitative data. In fact, in Section  
8 5.2.1.1 in the TBD where we talk about the  
9 uranium enrichment, Dolan and Hill did cite  
10 it, but it is also acknowledged that -- and I  
11 quote -- as another point of reference, in  
12 1951 to '68 history by Dolan and Hill, 1988,  
13 of the average uranium enrichment collected  
14 discharges, it basically says there is no  
15 data really that is documented.

16 I went through the report. It is a  
17 100 page report, and there is really no  
18 reference at all. In fact, there is only one  
19 statement here that I can quickly read to you,  
20 and it basically says that, in order to  
21 convert from microcuries to grams of uranium,  
22 the source of all radiation measured by the

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1 continued -- this was assumed to be normal  
2 uranium. This assumption is reasonable, since  
3 the plants process large numbers -- large  
4 quantities of depleted uranium and lesser  
5 amounts of low level enriched uranium.

6 That's the only statement I found  
7 in the report, and it is certainly not a  
8 quantitative statement.

9 MR. ROLFES: Okay, thanks, Hans. I  
10 wanted to call everyone's attention to the  
11 sample dose reconstruction that we've put to  
12 address this specific issue.

13 On the Advisory Board's document  
14 review folder, we have placed the FMPC  
15 internal number 14 sample dose reconstruction,  
16 which illustrates the methodology that we  
17 would use to reconstruct someone's internal  
18 exposures to enriched uranium.

19 The alum sodium reactor fuel  
20 element processing is described in the sample  
21 dose reconstruction briefly. This was placed  
22 onto the O: Drive back in October of 2007. I

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1 think we had discussed this at several working  
2 group meetings in the past. I just want to  
3 make sure that we have considered that  
4 information before we go into any new  
5 information.

6 MR. MAKHIJANI: Also, John, can I  
7 interrupt. If you go back to my original  
8 write-up of the SEC review under finding 4.1-4  
9 that starts on page 30, I did, in fact,  
10 identify and quote a number of memoranda that  
11 make reference to enrichments that range from  
12 three percent to five and up to 10 percent in  
13 the time period of 1968 to currently.

14 At least in that memoranda there  
15 was a reference to enriched uranium that  
16 ranged values up to 10 percent. Then I don't  
17 know if any of the other records would support  
18 that, but I guess they were concerned about  
19 criticality, and in anticipation of highly  
20 enriched material, they were obviously  
21 concerned about reconfiguration of various  
22 containers that were used to process this

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1 material.

2 So 1968 seems to be a target year  
3 for enrichments that well exceed the two  
4 percent that is currently assumed.

5 MR. ROLFES: Right. There are  
6 exceptions to our defaults, and it appears to  
7 us that they were documented very carefully,  
8 because that material was controlled  
9 differently than the normal products in  
10 Fernald.

11 Let's see. I wanted to make a  
12 correction to what I said before. The alum  
13 sodium reactor fuel elements had enrichments  
14 of 4.9 percent and 6.5 percent enriched  
15 uranium U-235.

16 Like I said, we have described how  
17 this is an exception to the normal work that  
18 was done at Fernald, and used this  
19 individual's whole body counting data and the  
20 documentation of the uniqueness of his  
21 exposures in our assessment.

22 MR. MAURO: Mark, we have no doubt

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1 that, if you know the individuals that are  
2 dealing with the enrichment and the level of  
3 possible enrichment, you can reconstruct a  
4 dose.

5 I guess our question goes toward  
6 that -- you know, you wrote that, when you  
7 come across a dose reconstruction, is enough  
8 information available to you that you know the  
9 people that you should be treating as a five  
10 percent enriched or a seven percent enriched.

11 The ones at two percent are going to be down  
12 there.

13 So yes, we would certainly agree  
14 that if you know who the people are and what  
15 they were handling, such as you make reference  
16 of this alum sodium reactor and other aluminum  
17 form of reactor -- I don't know if that is the  
18 same material, but in any event, sure, you  
19 could compare your milligrams per liter.

20 Our concern is are there any  
21 surprises? Are there people that might have  
22 gotten it, and are the records that you are

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1 dealing with such that you have a level of  
2 confidence that you could parse that, make  
3 that distinction?

4 MR. ROLFES: Right. And I think we  
5 had addressed this previously as well. I  
6 don't have a date in front of me, but I do  
7 remember specifically going through some of  
8 the mobile in vivo radiation monitoring  
9 laboratory results that we have and pulling  
10 out the ones that had notations of enriched  
11 uranium or special projects, things like that.

12 We also did the same thing for  
13 thorium workers. I believe those two finals  
14 were put onto the Advisory Board's document  
15 review folder.

16 MEMBER GRIFFON: The question is:  
17 Is that inclusive? Is that some people that  
18 were monitored or is that every person?

19 MR. ROLFES: It would certainly be  
20 the ones that were highest internally exposed.  
21 Based on the information that we have, the  
22 mobile in vivo radiation monitoring laboratory

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1 results, the people that were most highly  
2 exposed had the most routine schedule for  
3 counting.

4 What we found is that some of the  
5 people that had the higher exposures were  
6 counted sometimes more often than twice a  
7 year.

8 MR. MAURO: That's a chest count.

9 MR. ROLFES: Chest counting, right.

10 MR. MAURO: Now that started in  
11 '68.

12 MR. ROLFES: That's correct.

13 MR. MAURO: Now I guess my --

14 MEMBER GRIFFON: Just to follow up  
15 on that before you go, even if that is the  
16 case, then how do you -- there could be some  
17 people in those areas that weren't the highest  
18 exposures, but still got exposed to that  
19 enriched -- that different enrichment level.  
20 Right? So how do you identify those people,  
21 or do you just figure two percent will cover  
22 it, is what I'm getting?

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1 MR. ROLFES: Well, for example,  
2 like Plant 9 was the enriched uranium handling  
3 plant after it produced thorium. It was  
4 basically handling some of the higher  
5 enrichment materials, and by higher enrichment  
6 I am talking just slightly enriched, even  
7 generally above .71 percent.

8 Let's see. How would we handle?

9 MEMBER GRIFFON: So does everybody  
10 in Plant 9 get a higher assumption on this?

11 MR. ROLFES: Everyone across the  
12 site is being given the higher default.

13 MEMBER GRIFFON: Given the two  
14 percent?

15 MR. ROLFES: Right. Right.

16 MEMBER GRIFFON: But nobody is  
17 getting higher than two percent?

18 MR. ROLFES: Except when it is  
19 documented in a report like we have for the  
20 alum reactor or when there is a note on the  
21 individual's mobile in vivo data or there is a  
22 different ratio of U-235 to U-238 for total

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1 uranium in the individual's lung count  
2 results. So that piece of evidence would  
3 allow us to --

4 MEMBER GRIFFON: That would trigger  
5 something else. Right.

6 MR. ROLFES: Right.

7 MEMBER GRIFFON: And the two  
8 percent -- I think you answered this already,  
9 but your example with the two percent, that is  
10 your default across the site?

11 MR. ROLFES: That's correct. I  
12 have to take a look at the specific year. I  
13 believe it is after 1965.

14 MR. MAURO: There was a break  
15 point, I forget the date, but there was a  
16 break point, and the rationale for the break  
17 point is provided. My question -- I guess I  
18 was less concerned with chest count, more when  
19 you start with milligrams per liter.

20 MR. MORRIS: But there is a lot of  
21 information in the chest count record, because  
22 they did make specific notes on files when

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1 there was reason to believe that the work  
2 assignment had them in a different location.

3 They are so consistently done that  
4 they are notable.

5 MEMBER GRIFFON: It is more than a  
6 question of coverage. A lot of times those  
7 lung count programs, they do sporadically  
8 choose some workers.

9 MR. MORRIS: It wasn't sporadic.

10 MEMBER GRIFFON: Again, it is  
11 identifying the people.

12 MR. MORRIS: We have a health and  
13 safety manager's memo that came out probably  
14 beginning in 1968, and then again a few years  
15 later. It actually specified the exact  
16 criteria for why somebody would be pulled into  
17 the chest counter.

18 For example, they pulled in all the  
19 thorium workers initially, but then there was  
20 also a logic chart about who would be counted  
21 and why and how often.

22 MR. MAURO: For pre-'68, though,

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1 would I be correct in assuming that it is  
2 process knowledge that would allow you to  
3 parse who to go to treat special?

4 MR. MORRIS: I think that is fair.

5 MR. MAURO: And the process  
6 knowledge is available to you?

7 MR. MORRIS: We have quite a bit of  
8 interview information that tells us when and  
9 where that a sweetening was done.

10 MEMBER GRIFFON: But my concern --  
11 and maybe I am just restating the same thing I  
12 said, but my concern is not as much the  
13 process knowledge but connecting people with  
14 the process knowledge. It seems clear to me  
15 in the database and in some of the interview  
16 records and stuff like that that we have, that  
17 is not always intuitively obvious, how you do  
18 that.

19 You don't have building  
20 information. A lot of times you are dealing  
21 with survivors. So you don't know, that is my  
22 question, is could someone be in those special

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1 campaigns and not have been sampled at all,  
2 and you may never -- you know.

3 MR. MORRIS: Special campaigns, at  
4 least my perception of them from the  
5 interviews and the reading I have done, is  
6 that they were really brief. Now they would  
7 have been, you know, go get this three-  
8 kilogram batch of five percent uranium and mix  
9 it into this vat today. That would be like a  
10 two-minute job to do the injection of the new  
11 material into the big batch.

12 It wasn't like weeks and weeks of  
13 working with that material.

14 MR. MAURO: It sounds to me like  
15 it's not so much process knowledge. It is  
16 knowledge that the campaigns were so short  
17 lived that, when you average that --

18 MR. MORRIS: Mark and I have not  
19 talked this out.

20 MR. MAURO: I know, and that  
21 certainly sounds like a reasonable answer, as  
22 long as there is reason to believe that you

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1 didn't have processes that went on for a year.

2 MR. MORRIS: Right.

3 MR. MAURO: And if you have records  
4 where you could say, yes, it does not look  
5 like we have any evidence that there was five  
6 percent, seven percent, 19.9 percent process  
7 for an extended period of time -- and if turns  
8 out when it --

9 MR. MORRIS: I didn't see anything  
10 that would suggest that, John.

11 MR. MAURO: Okay.

12 CHAIR CLAWSON: So where are we at  
13 on this issue then?

14 MR. MAURO: Well, we are at the  
15 last item under what I call the uranium  
16 internal. Give me one second, please.

17 MEMBER ZIEMER: Well, were you  
18 going to close this item?

19 MR. MAURO: Right.

20 MEMBER GRIFFON: I mean, I would  
21 say, short of information showing that there  
22 was more extensive use of higher enrichments,

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1 I am comfortable with it. So yes.

2 MR. ROLFES: I found a reference  
3 here that I can mention, from 1975, February  
4 10th, on permissible lung burdens. There is  
5 attached to this individual's mobile in vivo  
6 results, there is some indication that he was  
7 working with higher enrichments. It gives  
8 the necessary adjustments for specific  
9 activity and its effect on the maximum  
10 permissible lung burden.

11 I know that there is a document --  
12 I don't know if it is this one -- that has  
13 descriptive information about the process that  
14 was going on, what plant that was done, and in  
15 this specific case it lists four specific  
16 individuals that were working on this  
17 campaign.

18 Let's see if there is any  
19 additional information.

20 MR. MAURO: Duration.

21 MR. ROLFES: That is what I am  
22 looking for.

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1                   MR. MAURO:     You've got like a  
2 weight of evidence argument, I would say. Not  
3 only do we believe they were short, we  
4 actually have a case where we have a person  
5 where we know and we can see how long he  
6 worked at that level, and what his annual  
7 enrichment exposure might have been.

8                   We know that for some period of  
9 time, it might have been above two, but it  
10 would almost be like a case study where, when  
11 you annualize it over the full year he might  
12 have worked, it effectively comes down to an  
13 average of less than two, and that would be  
14 sort of like a case study that demonstrates  
15 your argument.

16                  MR. ROLFES:   When you look at the  
17 actual enrichment information presented in the  
18 mobile in vivo results, this individual had  
19 participated in some of the campaigns where  
20 there was 6.5 percent enriched uranium that  
21 was handled.     I could take a look at the  
22 average enrichment that he was exposed to in

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1 his in vivo data. It shows roughly .5 percent  
2 enrichment for 1970, .64 for 1971, .79 for --

3 MR. MAURO: That shows an example  
4 of demonstrating your case that you just made.

5 MR. ROLFES: So everything -- and  
6 those are all -- typically, the first two  
7 measurements were less than an actual. So  
8 roughly depleted uranium that the individual  
9 was exposed to, and then slightly enriched  
10 material in 1972, which was .79 percent  
11 average. Subsequent to that, it was 1.5  
12 percent enrichment, and in 1974 was 1.3  
13 percent.

14 MR. MAURO: Also, even this fellow  
15 wasn't exposed at anytime to something above  
16 two percent.

17 MR. ROLFES: It is possible that he  
18 was exposed to the 6.5 percent enrichment.  
19 However, he wasn't solely exposed to that.

20 MR. MAURO: I'm sorry. You do  
21 information it was at some point prior to the  
22 process. Okay, good. I would say, that is

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1 sort of why it reinforces the position you are  
2 taking.

3 CHAIR CLAWSON: I guess my question  
4 is: So on this one, what do we want to do?  
5 Where do we want to proceed? Are we satisfied  
6 with that?

7 MEMBER GRIFFON: That is my -- I'll  
8 restate what I said, is that short of -- you  
9 know, with the assumption that these were  
10 short campaigns, I think that I'm okay with  
11 this two percent exception, and if we don't  
12 find any other evidence, then I'm okay with  
13 that. Paul?

14 MEMBER ZIEMER: That would make  
15 sense to me. Basically, every case you have  
16 seen, they have simply blended the higher  
17 enrichment stuff into the system. Is that  
18 right?

19 MR. MORRIS: That was the ordinary  
20 process.

21 MEMBER ZIEMER: That was the  
22 practice, you're saying.

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1                   MR. MORRIS:       Yes.       They had  
2 depleted uranium. They would sweeten it up to  
3 whatever the enrichment of slightly enriched  
4 was, if they needed it.

5                   MEMBER GRIFFON: Your sense is that  
6 at least some of the people that were involved  
7 in the blending operation were sampled,  
8 because you've got data to that effect.

9                   MR. MAURO: Yes.

10                  MEMBER ZIEMER: And the blending  
11 wouldn't take that long.

12                  MEMBER GRIFFON: A short time, and  
13 Mark just gave us an example.

14                  MR. MORRIS: The blended -- the  
15 higher enriched material was very valuable.  
16 So it was Fort Knox kind of stuff, and they  
17 would bring it in and add it to the large  
18 volume.

19                  MR. RICH: This is Bryce Rich. One  
20 further note to what Bob indicated is that the  
21 use of what I will call the higher enriched  
22 stuff was very carefully controlled from a DOE

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1       accountability   standpoint.       Some   of   the  
2       material -- they were not allowed to use it  
3       for blending and, matter of fact, sent it off  
4       site without using it in the process.

5               MR. ROLFES:   As I recall with some  
6       of the individuals, if they were to use a  
7       higher enrichment than a given amount -- and I  
8       don't recall the enrichment -- they had to get  
9       a specific approval from DOE headquarters in  
10      order to do that, because it would basically  
11      be throwing money away.

12              So if there was an exception, it  
13      was very infrequent.   The typical enrichment  
14      that they would use would be close to the  
15      other material.   They wouldn't try to blend 90  
16      percent enriched uranium with depleted uranium  
17      to try to get five percent,   you know.

18              MR. RICH:    Particularly if they  
19      didn't have 90 percent on site.

20              MR. ROLFES:   Exactly.

21              MEMBER GRIFFON:   And I think the  
22      other -- I think also on the other side of

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1 this is the two percent, given what I have  
2 read, what we know about the site. Well, you  
3 guys know more than I, but it looks like a lot  
4 of it was depleted. Overall, the average was  
5 probably much lower than two percent.

6 So I'm fairly comfortable. Given  
7 that the campaigns were short with the higher  
8 stuff, this is more than a reasonable  
9 approach, to me.

10 CHAIR CLAWSON: Is that -- I would  
11 say it's closed unless something else raises  
12 its head there. So is everybody in agreement?

13 MR. MAURO: We'll move on -- like a  
14 field goal, a red flag after a play in  
15 football. I have one more -- as I mentioned  
16 very early on, we have five major areas of  
17 concern. We are about to deal with the last  
18 item in the first area, and that has to do  
19 with what is called a finding on the 4.1-2,  
20 and I will read the issue, and you will know  
21 what I am talking about.

22 The questionable integrity of

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1 fluorometric urinalysis -- the concern is that  
2 there are numerous statements in memos and  
3 from all the records that the bioassay data  
4 cannot be reconstructed -- cannot be used to  
5 reconstruct doses. This is a data quality  
6 problem.

7           Earlier during the previous -- much  
8 earlier meeting, a year ago, the October 2007  
9 meeting, Mark had described in considerable  
10 detail a special study that was performed and  
11 put up on the Web related to data validation  
12 of the data. I guess it is to confirm the  
13 reliability of the data.

14           We did not discuss this issue. We  
15 never got to this issue, and -- let me see if  
16 I got this right. Oh, I'm sorry. I take it  
17 back. Give me a second, one second.

18           Oh, okay. In your review, you made  
19 reference to a military spec for doing these  
20 kinds of statistical -- you know what I am  
21 referring to now?

22           MR. ROLFES; I think so. That was

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1 for the HIS-20 comparison.

2 MR. MAURO: Yes. That's what this  
3 goes to, I believe. That's how I happened to  
4 mention it.

5 MR. NETON; I don't think so. My  
6 recollection was that the argument was that  
7 the data couldn't be -- there were memos  
8 saying you couldn't use the data for internal,  
9 because the old ICPR-2 model weren't valid.

10 MR. MAURO: So there's two problems.  
11 Yes. You are absolutely right. Now as I'm  
12 reading my notes here, there was two aspects  
13 to it.

14 One was what you just mentioned,  
15 and I think the general agreement at the time  
16 was -- well, no, no. The point was -- in our  
17 critique Hans made mention of numerous places  
18 in some old records and says you can't use  
19 this data for dose reconstruction. But upon  
20 our discussion, that statement was made,  
21 because at the time we did not have --

22 MR. NETON: The knowledge of

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1 histodosimetry was not as fast.

2 MR. MAURO: Right. Now that you do  
3 have the biokinetic models -- so, yes, I think  
4 we put that to bed.

5 MEMBER ZIEMER: And it wasn't the  
6 fact that it was fluorophotometric data.

7 MR. MAURO: There was no way -- at  
8 that time there was no reliable way to connect  
9 the urine analysis data to -- with inhalation  
10 and the subsequent dose.

11 MEMBER ZIEMER: I thought we had  
12 closed that.

13 MR. MAURO: Right. I'll just jump  
14 to the other item, which was not closed, and  
15 we were given some marching orders, and that  
16 has to do with -- we were asked -- in that  
17 quality assurance investigation that you folks  
18 performed, I guess, and looking at how  
19 faithful was the HIS-20 database, you sampled  
20 from 1950s, '60s, '70s and '80s.

21 I guess you sampled from the  
22 original data, hard copy data, and compared

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1 those hard copies against the data that was  
2 loaded into the HIS-20 database, and you  
3 summarized in some great detail in the  
4 transcript your results, identifying where  
5 there were matches, where there were some  
6 problems, and you had a lot of statistics  
7 describing the quality of the -- or the degree  
8 to which the material was transcribed.

9 SC&A was given a marching order in  
10 light of that, and I will read it: It says,  
11 "A discussion of the types of disparities that  
12 were observed in your work indicated that some  
13 were more significant than others. For  
14 example, in some cases it was simply the  
15 misspelling of a person's name would be  
16 considered to be an error, and it was scored  
17 as such. In other cases, it might have been a  
18 more severe, serious discrepancy."

19 The work group did ask us -- you  
20 may take a look; I have it here -- an action  
21 item was suggested to have SC&A look into this  
22 matter and then hold a separate telephone

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1 conference call related to the nature of the  
2 places where there were some disparities.  
3 That was the marching orders that we were  
4 given.

5 I do not believe we ever held that  
6 conference call.

7 MEMBER GRIFFON: Can I ask a  
8 question about -- I was looking through that  
9 HIS-20 data comparison, and the hard copy that  
10 you judged HIS-20 against were these  
11 analytical datasheets.

12 My question was: Obviously not or  
13 you would have used them, but I guess I will  
14 ask it anyway. Were there any laboratory  
15 logbooks available?

16 MR. ROLFES: I think you had asked  
17 that last time.

18 MEMBER GRIFFON: I think I probably  
19 did, yes.

20 MR. ROLFES: And we did look, and I  
21 don't recall seeing any.

22 MEMBER GRIFFON: So that is the

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1 most primary source you could find.

2 MR. ROLFES: Right.

3 MS. BALDRIDGE: I have a question.

4 Were those entries made by name, by number?

5 MR. ROLFES: What entries? I'm  
6 sorry.

7 MS. BALDRIDGE: Into the database  
8 from the old records, because I was going  
9 through my father's papers from National Lab.  
10 He had probably three different ID numbers  
11 assigned.

12 MR. ROLFES: The HIS-20 data --

13 MS. BALDRIDGE: So, you know, I'm  
14 sure two of them were errors, but still if  
15 some of his records were listed under the  
16 wrong number --

17 MR. ROLFES: The HIS-20 database  
18 has Social Security number. I can open it up  
19 and explain what we have within the database  
20 and then see if I can get a copy of the hard  
21 copy data that we used to compare to HIS-20.

22 I don't know if Gene Potter is on

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1 the line either. He would probably be able to  
2 answer right away. Do we have Gene Potter on  
3 the line? Doesn't sound like it.

4 MEMBER GRIFFON: I think we should  
5 plan this technical follow-up call anyway.

6 MR. MAURO: So I will take that as  
7 an action item. Those calls we didn't do last  
8 time, we will do it now.

9 CHAIR CLAWSON: Okay. Also to be  
10 able to address your concern of how they were  
11 entered in from the hard copy, be it name or  
12 number.

13 MR. ROLFES: What we had, I  
14 believe, were the -- in the early days, this  
15 is the one that I pulled up. The New York  
16 Operations Office, Health and Safety Division,  
17 had done some of the initial bioassays for the  
18 Fernald workers. They would collect urine  
19 samples and analyze them at the Health and  
20 Safety Lab.

21 What we did is compared scanned  
22 images of those -- I'm trying to recall. I

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1 think they were like an industrial hygiene  
2 sheet, like a data sheet with individuals'  
3 names, and I forget all the other parameters  
4 that were on there. But it typically would  
5 get a name and the bioassay results, in  
6 addition to the date of the analysis and the  
7 data collection.

8 I would have to take a look back to  
9 see what specifically is in there. Let's see.

10 The HIS-20 comparison has been out on the O:  
11 Drive since March 10th of 2008 as well.

12 MEMBER ZIEMER: What specifically  
13 is going to be the nature of the technical  
14 call?

15 MR. MAURO: Well, right now my  
16 understanding is that there were certain  
17 disparities in the numbers, where there were  
18 errors --

19 MEMBER ZIEMER: The database versus  
20 the original sheets?

21 MR. MAURO: Yes, the original  
22 sheet. It sounds like there's two aspects to

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1 it. We have the original sheets that were  
2 just handwritten hard copy, and --

3 MEMBER GRIFFON: Not handwritten.  
4 Typewritten.

5 MR. MAURO: Typewritten? I haven't  
6 seen them, but they are hard copy, and they  
7 were transferred into the HIS-20 database.  
8 Now originally there was a concern of how  
9 faithful was that transcription, and there was  
10 a report given on that.

11 There were a number of findings,  
12 and they were complex. It wasn't that it was  
13 a simple -- in the minutes, if you read the  
14 minutes of the last meeting, how they  
15 characterized the different kinds of findings  
16 -- there were all different types, and some  
17 were more important than others.

18 I guess at the time the work group  
19 felt that we would like to hear a little bit  
20 more about the nature of the disparities, the  
21 extent of those disparities, and for SC&A to  
22 look at those disparities and say, okay, we

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1 understand how the work was done -- in other  
2 words, how the sampling was done. They  
3 sampled, basically, and based on that sampling  
4 scheme, which followed a certain mill spec for  
5 doing these kinds of samples, using that mill  
6 spec they were able to make certain judgments  
7 about what number of errors there were. What  
8 is the percent of errors.

9 In other words, out of the  
10 thousands and thousands of numbers that were  
11 transcribed, what percent contained a type one  
12 error, type two error, type three error, type  
13 four error, and of those, which ones were the  
14 more serious.

15 In other words, have SC&A look at  
16 that a bit.

17 MEMBER ZIEMER: This is something  
18 NIOSH has already done.

19 MR. ROLFES: We have already done  
20 that. I can get the executive summary, if you  
21 like.

22 CHAIR CLAWSON: You've already

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1 evaluated the database in the manner  
2 described. So you are just saying let's take  
3 a look at what they did and make sure we are  
4 comfortable with their analysis. Is that what  
5 we are talking about? Sounds like it's  
6 already been done.

7 MR. MORRIS: Brad, if I might offer  
8 a suggestion, I would suggest that the charter  
9 you give to SC&A would be look at the errors  
10 that were identified and see if they might  
11 have an impact on a co-worker study, because  
12 that really is the big picture for why you are  
13 doing it.

14 CHAIR CLAWSON: Well, if you  
15 remember right, when we got into this last  
16 time, the mention came up there were so many  
17 discrepancies. But if I remembered right, it  
18 wasn't broke down, and it's like what Mark --  
19 you know, some of them were just a misspelled  
20 word or so forth like that, and many of them  
21 were into this.

22 This is why we tasked SC&A to look

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1 into that.

2 MR. MORRIS: Because it would be  
3 easy to come to a conclusion that there was a  
4 failure of the dataset for some reason that  
5 didn't impact anything you cared about.

6 MEMBER ZIEMER: Sure.

7 MR. MORRIS: But, you know, if you  
8 are really focused on what do you want the  
9 dataset to do for you, accurately reflect  
10 population doses or accurately reflect the  
11 individual doses or whatever the goal is,  
12 don't get sidetracked by looking for some  
13 trivial error that really is not important.

14 MR. MAURO: It goes to the DQO  
15 argument, which I completely agree with. But  
16 when you are doing your work, figure out what  
17 it is you are doing and why you are doing it.

18 MR. MORRIS: Because we scored it  
19 fairly hard. I mean, if there was a mistake,  
20 it was a mistake. But is it an important  
21 mistake is the next question.

22 MR. ROLFES: I can present the

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1 executive summary. It should only be a  
2 minute.

3 Since data extracted from the HIS-  
4 20 database was used in the uranium bioassay  
5 co-worker study for the feed materials  
6 production at Fernald, verification of the  
7 completeness and accuracy of the data in HIS-  
8 20 was desired.

9 An accepted sampling plan was  
10 developed using a statistical method known as  
11 sampling by attributes. Hard copy records  
12 were acquired independently during data  
13 capture trips by members of OCUS and the ORAU  
14 team. They consist mainly of analytical  
15 datasheets, urine request cards and annual  
16 urinalysis summary reports.

17 For this study, 33 electronic files  
18 scanned from hard copy bioassay results were  
19 examined. There were eight files which were  
20 primarily subcontractor or gross alpha and  
21 beta results. These files were eliminated,  
22 since they would not affect the co-worker

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1 study for feed materials production center  
2 employees.

3 Twenty of the remaining 25 files  
4 met the criteria selected. Five files did not  
5 meet the criteria, but were unlikely to result  
6 in anything that became changes to the co-  
7 worker study, if the data missing from HIS-20  
8 were to be included.

9 Overall, approximately 90 percent  
10 of the data was matched, with only a few files  
11 accounting for the majority of the results  
12 that were not located in HIS-20.

13 MEMBER ZIEMER: I think that is  
14 very helpful, and from my perspective it would  
15 be fine if you had your statisticians look at  
16 that design and see how we agree with that  
17 design, and then look at the conclusions and  
18 see if you agree with those or if, for some  
19 reason, you think that design is completely --  
20 I mean, I can sit here and hear it, and it  
21 sounds good, but I don't now if you had enough  
22 samples or not.

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1                   MEMBER GRIFFON: I have a question  
2 about the part you left out, that it wouldn't  
3 affect the -- you have already excluded some  
4 data, because you said it wouldn't affect the  
5 co-worker model, but we are not only concerned  
6 about the co-worker model. We are looking for  
7 systemic problems within the data, I think,  
8 aren't we?

9                   You excluded -- I missed it -- I'm  
10 sorry -- when Mark was reading this --  
11 excluded gross alpha/beta. Reread that.

12                  MR. ROLFES: I can reread that, but  
13 this was done for the co-worker study to  
14 determine whether the uranium bioassay data  
15 was sufficient to generate a co-worker model.

16                  Yes, these files were eliminated --  
17 let me get back to that. For this study, 33  
18 electronic files scanned from hard copy  
19 bioassay results were examined. There were  
20 eight files which were primarily subcontractor  
21 or gross alpha/beta results. These files were  
22 eliminated, since they would not affect the

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1 co-worker study of Fernald employees.

2 MEMBER GRIFFON: And you were doing  
3 that, because that was your purpose. I got  
4 it, yes.

5 MR. MORRIS: Yes. We wouldn't want  
6 alpha/beta -- gross alpha/beta, because we  
7 were looking at a different set of -- we don't  
8 care.

9 MEMBER GRIFFON: But our objective  
10 is maybe a little farther than that.

11 MR. MORRIS: Could be. I'm not  
12 suggesting that -- you just need to figure out  
13 why you want to do this, because you will find  
14 things like that in here that we scored as  
15 failures that may not be a failure from your  
16 perspective.

17 MR. ROLFES: I can break down those  
18 33 finals. I've got some of the data here as  
19 well. It's a 15 page White Paper, if you are  
20 interested in looking at it in more detail.  
21 But I believe we were asked to select various  
22 decades for the study.

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1                   So what we did -- let's see. For  
2 the 1950s we selected 16 files. For the  
3 1960s, we selected seven files. For the  
4 1970s, we selected five, and for the 1980s we  
5 selected five. So that gave us a total of 33  
6 files which were evaluated.

7                   MR. MAURO: Are these people?

8                   MR. ROLFES: No, these are files,  
9 like they could have 200 pages of different  
10 individuals listed and multiple urine samples  
11 in there.

12                  MEMBER GRIFFON: And was this  
13 selected -- I mean, did you weight that for a  
14 reason or was it just that there are more  
15 reports available?

16                  MR. ROLFES: I think a couple of  
17 years back there was some concern that some of  
18 the individuals in the earlier days might not  
19 have been monitored as frequently or that the  
20 correct people might not have been monitored.

21                  MR. MORRIS: Also, the shift from  
22 the New York Operations Office monitoring to

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1 the on-site monitoring. So those were the key  
2 areas that we started to focus.

3 MR. ROLFES: And also, the Fifties,  
4 we would be relying primarily on uranium  
5 urinalyses to complete those reconstructions.

6 We have additional information. We would  
7 have air sampling data, if necessary, back  
8 then as well, but in the Sixties, that is when  
9 the mobile in vivo unit came to the site. So  
10 we have another piece, essentially a  
11 confirmatory piece of data to use in addition  
12 to the urinalysis results.

13 So we've got two different data  
14 sources that we can use to do a dose  
15 reconstruction. So I think that was -- there  
16 was a gradual change to, you know, do fewer  
17 sampling or fewer files to sample in the more  
18 recent time period.

19 MR. MAURO: Should I move on?

20 CHAIR CLAWSON: If you would. I  
21 was just going through some of the data here  
22 and stuff like that, looking at some of what

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1 they have. But go ahead and go on.

2 MR. MAURO; Well, we have basically  
3 concluded the first major set of findings  
4 related to basically uranium bioassay samples.

5 Now the second finding deals with  
6 the K-65 silos and exposure to radon and  
7 exposure to, I believe, some -- there was some  
8 discussion of radium and radon emanation.

9 We never got to that subject in the  
10 last meeting on March 26th. We skipped over  
11 it.

12 MEMBER GRIFFON: What are you on?

13 MR. MAURO: Oh, I am on Number two.  
14 I am on my big matrix.

15 MEMBER GRIFFON: That's 4.2?

16 MR. MAURO: I'm on 4.2. It's on  
17 page 12.

18 MEMBER ZIEMER: K-65 wastes and  
19 raffinates.

20 MR. MAURO: Right. Now previously  
21 this just had a single page on 4.2-1 and -2.  
22 There are a couple of issues, and we never got

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1 in the last meeting to this, because we went  
2 on to 4-3 which deals with thorium, I believe.

3 So we never really got to 4-2 in the last  
4 meeting because of the overriding concern  
5 regarding reconstruction of doses to workers  
6 exposed to thorium-232, especially during the  
7 years pre-1968 when you were basing --

8 At that time, if you recall, at the  
9 last meeting, it was an important meeting,  
10 because we spent most of our time discussing  
11 the daily weighted exposure data.

12 So I guess I have a question for  
13 the work group at this time. One of the  
14 action items that came out of the last meeting  
15 which was very important was that NIOSH would  
16 look at the download and report on the daily  
17 weighted exposure data for 1955 and 1966 for  
18 all buildings as being a way to demonstrate to  
19 the work group that we have a very complete  
20 daily weighted exposure dataset.

21 If you recall, at the time of the  
22 meeting there was a nice matrix table that was

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1 handed out that had by year, by building, and  
2 there were little dots in each box, and each  
3 dot represented a report, and you have a total  
4 of 160 such reports.

5           It was all agreed that, if you  
6 really have lots of daily weighted exposure  
7 data for everyone of those dots, in theory you  
8 could build a co-worker model for everyone of  
9 those boxes or some -- when you didn't maybe  
10 aggregate, but the point being that you had  
11 such an abundance of daily weighted exposure  
12 that in theory you could build one or more  
13 sets of curves representing different time  
14 periods, different worker type, different  
15 buildings; and once you have that distribution  
16 of daily weighted exposure, you then have the  
17 luxury to select the upper -- for any given  
18 worker, you have the luxury of selecting the  
19 upper 95th percentile, the median, maybe a  
20 lower end value.

21           In other words, from an SEC  
22 perspective, if you have that data the way it

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1 was represented at the last meeting, you were  
2 in a very strong position to say you can  
3 reconstruct doses with sufficient accuracy.

4 MR. MORRIS: The normal reason to  
5 do that would be for thorium, though.

6 MR. MAURO: For thorium-232 only.  
7 See, the big problem previously was you were  
8 going to go to 1050 MAC --

9 MR. MORRIS: That's right.

10 MR. MAURO: -- MAC continuous  
11 exposure. For 2,000 hours per year, people  
12 were always exposed at 1050 MAC to thorium-  
13 232. We had a lot of criticisms of that, and  
14 that goes way back. Then --

15 MR. RICH: John, I am a little  
16 confused. I thought you were discussing  
17 radon.

18 MR. MAURO: No, no, no. I'm sorry.  
19 Let me clarify.

20 What I'm saying is we have -- right  
21 now we have one set of issues dealing with the  
22 K-65 silos and radon, and there's a bunch of

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1 issues there. Then we have -- I'm going to  
2 call that issue number two and all its sub-  
3 issues.

4 Then we have issue number three and  
5 its all sub-issues, which deals with thorium-  
6 232 exposure. All I was trying to explain,  
7 and we sort of got down the road a little far,  
8 was that at the last meeting we elected to  
9 jump over the K-65 silo set of issues and go  
10 to issue number three, 4.3, which deals with  
11 thorium-232 and the daily weighted exposure.

12 At that time, an action item at  
13 that time was given to NIOSH to look into that  
14 data. I just wanted to point this out to the  
15 work group, that we have a choice now. We can  
16 continue and go in sequence and go on to issue  
17 number two, which has to do with the K-65  
18 silos and the radon issues and other matters,  
19 or we can jump over that and go to the  
20 thorium-232 issue, given that it is already  
21 2:30.

22 So I guess we will do whatever you

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1 folks would like to do.

2 MEMBER GRIFFON: I guess it depends  
3 on how much material we have to discuss. I'm  
4 not sure we have -- do we have any new  
5 information on either one of these topics? I  
6 think we are waiting on the thorium.

7 MR. MAURO: Will you mind if I  
8 ask, did you folks have a chance to look at  
9 the 1955 and '66 dataset?

10 MR. ROLFES: No. That was the only  
11 thing that I was aware of that we owed the  
12 working group on Fernald. That was the only  
13 open issue that NIOSH needed to produce  
14 something for the Advisory Board. We still  
15 owe that.

16 MR. MAURO: Okay, then you know  
17 what? Then there is no reason to go there.

18 MR. ROLFES: Right.

19 MR. MAURO: Let's go hit number  
20 two.

21 MEMBER GRIFFON: I agree.

22 CHAIR CLAWSON: But we've got it

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1 documented that that is still -- right?

2 MR. ROLFES; Yes. Yes. I believe  
3 we've got the White Paper written that will  
4 allow us to assign the intakes from the daily  
5 weighted exposure results. We had some  
6 internal comments which we've resolved. They  
7 are in the process of resolving, and then this  
8 second step that we would need to take is to  
9 download that data or populate that data into  
10 our exposure model to determine what the  
11 intakes would be for those plants for those  
12 years of 1955 and 1966.

13 MR. ELLIOTT: Mark, the product  
14 that we owe is a White Paper?

15 MR. ROLFES: Correct.

16 MR. ELLIOTT: And that is in  
17 review, you think?

18 MR. ROLFES: That's correct.

19 MR. ELLIOTT: So it's imminent, I  
20 would say.

21 MR. ROLFES: It is just really  
22 final comments. We have some comments on the

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1 statistics that were used, and I think we have  
2 pretty much resolved the path forward, and it  
3 is just a matter of documenting them in the  
4 final product.

5 MR. NETON: That would have been a  
6 while ago.

7 MR. ROLFES: Yes.

8 MR. NETON: I remember reading it.

9 MEMBER GRIFFON: There is a sub-  
10 folder on the O: Drive that says exposure  
11 studies. Is that where that is going to end  
12 up?

13 MR. ROLFES; Yes.

14 MEMBER GRIFFON: Because it's blank  
15 right now. Okay.

16 MR. ROLFES: Yes, with an empty  
17 folder.

18 MEMBER GRIFFON: That's where it  
19 will be. All right. We'll keep an eye out.

20 MR. ROLFES: It's a placeholder.

21 MR. KATZ: You will send out a  
22 notice. Right?

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1 MR. ROLFES; I sure will.

2 MR. MAURO: We are on 4.2-1. This  
3 has to do -- fundamentally, it has to do with  
4 the K-65 silos, raffinates and radon  
5 exposures, and there are three sub-issues, and  
6 I guess we could take them one at a time, but  
7 in concept. I always like to look at these  
8 things almost like a picture.

9 You know, what you have is workers  
10 that either loaded the silos and, therefore,  
11 were exposed to these raffinates, which had  
12 high levels of radium and thorium in it, and  
13 the question becomes how are you going to  
14 reconstruct the dose, internal doses, to those  
15 workers? That's an important category of  
16 concern.

17 There is also the issue, and very  
18 important issue, that Hans had brought up in  
19 one of his analyses, is the radon emanation  
20 rate from the K-65 silos. The issue has to do  
21 with a specific model that was done by John  
22 Till's organization, I believe, where the way

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1 in which the exhalation rate of radon from the  
2 silos was modeled. It was by a diffusion  
3 model which took into consideration the  
4 breathing rate, so to speak.

5 As the temperature and pressure  
6 changes outdoors, you get a delta P across the  
7 cap, and you get exhalation, and you came up  
8 with a source term for radon. I remember the  
9 number will be about 6,000 curies per year  
10 per silo, or maybe on that order.

11 When we reviewed that -- let's go  
12 down that road. Let's talk radon. There are  
13 other issues, but we might as well go with  
14 that one first. That's the one that is  
15 freshest in my mind.

16 When we reviewed that, we first  
17 said let's see if we can get the same number  
18 you folks got, the 6,000 curies per year  
19 number by running our own diffusion models and  
20 transport, using the diffusion coefficients  
21 and looking at the literature and all that,  
22 basically checking the work done by -- I think

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1 it was Till and Meyer -- or, no, John Till and  
2 Rack who did it, I guess, as part of the dose  
3 reconstruction for Fernald, off-site dose  
4 reconstruction for Fernald.

5 So we had our folks that do that  
6 kind of analysis look at that, and the bottom  
7 line is you have about the same number. The  
8 6,000 looks good.

9 At the same time, Hans was looking  
10 at it from a completely different perspective.

11 We like to try to come at problems from other  
12 directions, and he said, well, let's look at  
13 the inventory of radium-226 and its progeny  
14 based on the sampling that was done inside  
15 those silos, pulled samples, lots of samples.

16 It turns out there was a deficit of  
17 lead-210 and polonium-210. In other words,  
18 the progeny of radon were lower than what we  
19 expected it to be. In other words, if there  
20 was full equilibrium between the radium-226  
21 and all its progeny, you would expect the  
22 inventory or the concentrations in the silos

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1 to be more or less the same. By and large,  
2 the radon, most of it, stayed --

3 MR. NETON: The radon didn't go  
4 anywhere.

5 MR. MAURO: Didn't go anywhere.  
6 You would get equilibrium.

7 MR. NETON: That can happen.

8 MR. MAURO: And we know that can  
9 happen. So Hans went through a set of  
10 calculations. Hans, I'm stealing your  
11 thunder, because it's a good story.

12 MR. NETON: And you can do it.

13 MR. MAURO: Bottom line is Hans  
14 came up with -- based on the deficit, came up  
15 with a number 10 times higher, 60,000 curies  
16 per year being the exhalation rate.

17 MR. NETON: Well, it's nice to say  
18 that. We would like to see the analysis

19 MR. MAURO: Oh, no, no. Hans, was  
20 that written up? Are you on line?

21 MR. BEHLING: No, it is just  
22 basically a back-of-the-envelope calculation,

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1 but it really links the data in Table 5-16,  
2 isotopic composition of K-65 silos 1 and 2,  
3 and there you see the silo 1. The radium-226  
4 activity was 477, and for the lead-210, 202.

5 So you realize you are way out of  
6 equilibrium, and that deficit has to be  
7 accountable by the escape of radon-222.  
8 That's the only explanation you can have,  
9 assuming these numbers have merit.

10 On that basis, I calculated the  
11 loss of about 60-some-thousand curies per year  
12 for silo 1 as an average value. I don't have  
13 the numbers in front of me of the calculation  
14 I did on a back of a scrap piece of paper, but  
15 it is clearly a value that does not jibe with  
16 John Till's numbers.

17 MR. NETON; Hans, is it not  
18 possible that radon decayed in the head space?

19 I mean, you are assuming that, since it is  
20 not there, it all went out the stack, but  
21 you've got a head space there that holds up  
22 the gas. Do you think that --

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1 MR. BEHLING; Well, it is possible,  
2 but for the majority of years there was no cap  
3 on those silos, meaning that the head space  
4 was free to vent into the atmosphere. I don't  
5 remember the year that there was a cap put on  
6 top of the silos, which would make that  
7 argument a moot argument.

8 MR. NETON: Well, the silos I've  
9 seen have always had caps on top of them.  
10 They weren't open structures.

11 MR. BEHLING; If I recall, the caps  
12 were put on very late, maybe Eighty.

13 MR. NETON: Well, we need to look  
14 at it.

15 CHAIR CLAWSON: Excuse us. Did  
16 someone try to say something?

17 MR. BEHLING: Arjun, go ahead.

18 MR. MAKHIJANI: I think Jim and  
19 Hans are talking about two different things.  
20 There is the vent cap over the --

21 MR. NETON: That was inside the  
22 dome itself.

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1                   MR. MAKHIJANI:     Yes, inside the  
2 dome, and what Jim is talking about is the  
3 head space.

4                   MR. NETON:        They weren't open  
5 cylinders, Hans.     They were closed domed  
6 structures.        In fact, that was -- the  
7 bentonite clay cap was added to retard the  
8 migration of radon out of the material itself.

9                   MEMBER GRIFFON:    There had to be a  
10 diffusion -- we need to see -- submit  
11 something.

12                  MR. MAURO:     I think that is a wise  
13 decision.    It sounds like SC&A needs to submit  
14 to the work group the calculations of the  
15 deficit, and then -- and take a look at it and  
16 see if you -- we don't want back-of-the-  
17 envelope.

18                  MR. NETON:        The head space  
19 concentrations were horrendous in those silos.

20                  MR. MAURO:     I think we have that  
21 data, too, because that is what --

22                  MR. NETON:     Right, but that needs

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1 to be considered in the compilation. Yes.

2 MR. MAURO: Yes, and the end  
3 result. Very good. That's a good point. So,  
4 Hans, we are going to put together a White  
5 Paper, and factor in the measurements --  
6 because they had to make those, because the  
7 way John Till did the work is he took samples  
8 from the head space, and then owing to delta P  
9 and diffusion coefficients through the cracks,  
10 he had a breathing rate.

11 Now you are saying that that may be  
12 where the radon is. The deficit is --

13 MR. NETON: There is a huge  
14 equilibrium concentration of radon in the head  
15 space.

16 MR. MAURO: But wouldn't that --  
17 where then --

18 MR. NETON: Oh, drop on top of the  
19 dome, played out on the inside.

20 MR. MAURO: So in other words, the  
21 deficit may be that it is not -- the polonium  
22 and the lead may not be where you think it is.

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1 For example --

2 MR. NETON: Well, the radon is  
3 going to migrate far from its site of origin.

4 It is not going to stay there.

5 MR. MAURO: Right. I remember they  
6 described a sample of it. I think they took  
7 cores that went across and down, and pulled  
8 the sample and got the concentration; because  
9 there was some kind of a -- it wasn't  
10 necessarily uniform, because what they were  
11 trying to do is get an inventory.

12 So we are operating on the premise  
13 that the inventory inside the box, inside the  
14 silo, has a certain number for radium, and a  
15 number for the progeny is much lower than we  
16 thought it would be.

17 MR. NETON; I'm saying it is not  
18 uniformly distributed inside that box.

19 MR. MAURO: Right. But the intent  
20 of the sample --

21 MEMBER GRIFFON: Taking into  
22 account the headspace.

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1                   MR. MAURO:           Taking into  
2 consideration, okay.

3                   MR. NETON:    I don't know if that's  
4 half or not, but I think that is something  
5 that needs to be considered.

6                   CHAIR CLAWSON: Will SC&A write  
7 something up for the work group and NIOSH to  
8 be able to review?

9                   MEMBER GRIFFON: Can I ask? I  
10 think we got to pay attention to speaking one  
11 at a time, but can I ask: In the matrix on  
12 this, Mark, 4.2.1, 4.2-1, whatever, in the  
13 NIOSH response there's a couple of things that  
14 indicate that you were going to provide more  
15 information. I just wanted to follow up on  
16 that.

17                   The first one says provide radon  
18 breath data. Raffinate air data is being  
19 assembled into a spreadsheet. Is this  
20 completed? I guess it comes up in the later -  
21 - or in the earlier action. I don't know.

22                   MR. MAURO: Yes. You just moved on

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1 to the second.

2 MEMBER GRIFFON: Oh, okay, I'm  
3 sorry.

4 MR. MAURO: No, that's okay.

5 MEMBER GRIFFON: Well, then the  
6 last thing, it also talks about more data  
7 being gathered. So we will get that in the  
8 next item, I guess, but I just wanted to make  
9 sure we didn't miss any NIOSH actions.

10 MR. ROLFES: Right. Like I said,  
11 to the best of my knowledge, we have provided  
12 everything that we have been asked and put it  
13 onto the O Drive. The radon breath data are  
14 there on the O Drive under breath radon  
15 bioassay, and I believe there is data here for  
16 1952, 1953 and 1954.

17 Let's see. The raffinate air  
18 monitoring data: There is air monitoring data  
19 in the daily weighted exposure reports as  
20 well. I know some of the thorium air  
21 monitoring data that we had entered into an  
22 Excel spreadsheet did contain some raffinate

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1 air data, but ultimately we have radon breath  
2 data, which would have recorded an  
3 individual's exposures to raffinates.

4 MR. MAURO: And as you know, we did  
5 not discuss this issue at the last meeting,  
6 and SC&A has not taken -- I have in the  
7 records that, yes, the way to deal with one of  
8 the problems, the raffinates, is you could  
9 estimate radium intake based on radon  
10 exhalation.

11 Apparently, you put the material on  
12 the O Drive, and that's where we are right  
13 now.

14 MR. ROLFES: There is also -- in  
15 some claimants' files as well there is radium  
16 excretion data in some.

17 MEMBER GRIFFON: That was the one  
18 point I was looking at, was that after that  
19 statement -- at the very end of that  
20 statement, it says radon breath data is also  
21 radon excretion data, and more data are being  
22 gathered. I didn't understand, like what's

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1 that mean, you know.

2 Everything you've found is posted  
3 there. Right?

4 MR. ROLFES: Right. Right, with  
5 the exception of the daily weighted exposure  
6 studies, which, for example, you know, an  
7 individual could have been exposed to  
8 raffinates in plant 2/3 or something.

9 Those additional reports are  
10 available in the site research database. They  
11 haven't been pooled because there's 160 of  
12 them, and I think that is why we had agreed  
13 just to do those two years, for '55 and '66.  
14 That could sort of take care of two items with  
15 one set of reports.

16 CHAIR CLAWSON: Mark, was there --  
17 on site, was there any radon measurements or  
18 so forth that you know. The reason being is  
19 because in my Mound interviews there is an  
20 individual that came down that was requested  
21 by Fernald to come down and do some radon  
22 measurements.

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1 I think we have discussed this once  
2 before, and we could never find --

3 MR. ROLFES: What they would do  
4 when they would collect an air sample is  
5 typically allow it to decay for, say, three  
6 days or a week to allow the radon to decay.

7 There are documented air samples  
8 for radon concentrations in the early years,  
9 and for example, if an individual was exposed  
10 to radon and inhaled only radon and gave a  
11 radon breath bioassay sample, they would be  
12 exhaling some of that radon that they breathed  
13 in.

14 What we are doing with that radon  
15 bioassay data is assuming that that radon  
16 source also had associated with it the radium  
17 and other radionuclides that the individual  
18 would have inhaled to be excreting that amount  
19 of -- or exhaling that amount of radon.

20 There are data. In the more recent  
21 years, I know that was one of the things that  
22 was pretty commonly done. There was a lot of

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1 research with window panes and CR-39 track  
2 edge detectors to determine what some of the  
3 historical concentrations of radon in some of  
4 the different plants, inside and outside of  
5 the plants were done.

6           The Susan Pinney report that was  
7 produced and just discussed at a public  
8 meeting by a different division of NIOSH or a  
9 different office of NIOSH focused on the  
10 reconstruction from 1952 through 1989 of  
11 historical radon exposures to workers by  
12 plant, by shift. That was also information  
13 that we did consider in the SEC evaluation for  
14 Fernald.

15           MR. NETON: Just to clarify, those  
16 are for outdoor exposures, though, not in the  
17 plants.

18           MS. BALDRIDGE: Could I ask? I  
19 attended that meeting, and I asked Dr.  
20 Horning, who did the research along with Dr.  
21 Pinney, as to whether the CR-39 process of  
22 reading the radium off of the glass panes

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1 differentiated between radon-222 from uranium  
2 and radon-220 from thorium.

3 I was told it did, but none of the  
4 thorium radon was included in the report.  
5 They also brought up the issue of the Q-11  
6 silos near the production area in the center  
7 of the facility.

8 MR. ROLFES: Right. Those Q-11  
9 silos were found to be a contributor as well  
10 to the radon exposures that were incurred on  
11 site, and that was considered in the study as  
12 well.

13 MR. NETON: Well, I can attest to  
14 what was measured, because I placed those  
15 detectors myself on some of the buildings, and  
16 the analysis that was done in England by  
17 Professor Henshaw did indeed differentiate  
18 between the daughters of thorium and the  
19 daughters of radon, radon-222.

20 MEMBER ZIEMER: Based on track  
21 length?

22 MR. NETON: Track length, yes,

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1 because you got a very high energy alpha from  
2 the thorium. It=s like 8.78 MeV, something  
3 like that. So that was the initial question  
4 when they identified the large -- I was  
5 shocked at the number of tracks these  
6 detectors pick up on plant 2/3, I think it  
7 was, on the outside windows.

8 So I actually called him, and I  
9 said could this have been from thorium, and he  
10 said, no. He measured the track lengths, and  
11 they were not long enough to be related to  
12 thorium exposure.

13 The other thing about thoron  
14 daughters is thoron gas has a 55 second half-  
15 life. So in general, it doesn't migrate very  
16 far from the source, as like radon gas has a  
17 3.8 day half-life.

18 MS. BALDRIDGE: How would you -- is  
19 there any data or comparison as far as how  
20 much thorium there was on site as compared to  
21 uranium? Thorium would have been how much of  
22 the --

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1                   MR. MORRIS: I don't recall, but I  
2 could answer that question for you.

3                   MS. BALDRIDGE: She indicated that  
4 the reason it was insignificant was that it  
5 was less than a half of a percent.

6                   MR. MORRIS: That sounds, by mass,  
7 about right to me.

8                   MR. NETON: There were 15,000  
9 containers of thorium at one time on this  
10 plant site.

11                   MS. BALDRIDGE: Even considering it  
12 was a national repository?

13                   MR. NETON: It was in one location  
14 stored in a building.

15                   MR. MORRIS: Building 65. The  
16 thorium campaigns were tiny compared to the  
17 uranium campaigns. I mean, they weren't tiny  
18 by anybody's standards, except by comparison  
19 to uranium, which is, I think, what you just  
20 asked.

21                   MR. NETON: I think we have  
22 measurements for thoron concentrations in

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1 building 64-65.

2 MR. ROLFES: Correct. We do have  
3 that data for Building 64 and 65. That was  
4 the largest repository on site, and let's see.

5 We have data. I don't want to get an  
6 incorrect date, but I know we have data from  
7 back in the large production campaign in 1954-  
8 55 from plant 9.

9 There is some air monitoring data  
10 where they were allowing the thoron to decay  
11 before they determined the long-lived  
12 activity.

13 MEMBER ZIEMER: Well, I might  
14 insert here, just as a reference point, that  
15 the process you describe is always done for  
16 air samples anywhere, as far as I know. That  
17 would not be unique to Fernald. You are going  
18 to get radon and thoron daughters everywhere  
19 in the world virtually.

20 MR. NETON: That's true, but it is  
21 somewhat exacerbated by the Fernald situation.

22 MEMBER ZIEMER: Yes, but to get the

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1 long-lived end product, you always have to let  
2 radon and thoron decay, and you can use that  
3 measurement also to back-calculate the amounts  
4 of those as well.

5 MR. MAURO: What I'm hearing is  
6 that there are two methods that are available  
7 to us to evaluate the doses to workers on site  
8 from radon. One method is apparently a lot of  
9 radon exhaled from this K-65 silos, and based  
10 on that exhalation rate -- and let's say it's  
11 the 6,000 curies per year number, as estimated  
12 by Till. Then from there, if I recall, you  
13 use some atmospheric dispersion assumptions to  
14 estimate what the airborne concentration of  
15 radon would be in the vicinity of these silos,  
16 and that would be the concentrations that  
17 would be experienced by on-site workers.

18 I'm hearing that, independent of  
19 that, you have these other on-site  
20 measurements of actual -- as if you had some  
21 kind of detector.

22 MR. NETON: CR-39 detector like you

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1 tape to the glass, the window glass.

2 MR. MAURO: On the buildings?

3 MR. NETON: Yes.

4 MR. MAURO: And so in effect --

5 MR. NETON: The glass is sort of a  
6 long term integrator of accumulator radon  
7 exposure, because you get the deposition of  
8 the daughters on the pane, and then when the  
9 ones that ejected out were going out embed the  
10 polonium-210 in the glass itself. You put  
11 these CR-39 detectors on the surface. You  
12 measure the alphas coming off that's embedded  
13 in the glass.

14 MR. MAURO: Now is there a way in  
15 which these two independent sets of  
16 measurements that deal with the same subject  
17 can be used to confirm each other?

18 MR. NETON: Well, actually, see,  
19 there was two separate source terms. There  
20 was the K-65 silos themselves, but there was  
21 also a certain amount of ore processed through  
22 the plant itself, and that is where this

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1 analysis comes in, because it was measuring  
2 another source term.

3           There was another -- not to confuse  
4 terms, but a silo near plant 1 and 2-3 that  
5 contained at times the ore that was being run  
6 through the plant in the very early years, and  
7 in fact, at one point I think the -- the  
8 material was in K-65. It was actually stored  
9 on pads in these containers near plant 1, I  
10 think, the plant 1 pad.

11           MR. MAURO:     So then these two  
12 numbers -- I was just look at the way --

13           MR. NETON:     Yes.     The rest is  
14 complementary. I mean one is the radon source  
15 term from the silos. The other one is the  
16 radon more localized due to the storage of the  
17 K-65 type material and processing.

18           MR. MAURO:     On the pad.

19           MR. NETON:     On the pad.

20           MR. MAURO:     Never mind.

21           CHAIR CLAWSON:   So --

22           MR. MAURO:     So I see we have one

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1 item, action item. Tell me if there is  
2 anything else. We need to deliver a report to  
3 you, Hans' calculations showing why, based on  
4 our analysis, that the 6,000 curies per year  
5 might be too low, substantially too low, and  
6 we can certainly take into consideration your  
7 recommendation to look at the head space.

8 MR. NETON: Yes, and I don't know  
9 that -- has the Penny Horning/Horning Penny  
10 study been incorporated into the site profile  
11 yet?

12 MR. ROLFES: We were in the process  
13 of revising the information, but it hasn't  
14 been released or submitted to us. We have  
15 been working on white papers, et cetera.

16 MR. NETON: Right. That is  
17 something that needs -- probably also needs to  
18 be looked at, because that's a separate source  
19 term that is now going to be included in the  
20 site profile.

21 So virtually anyone who ventured on  
22 the site during those years would be assigned

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1 some level of radon intake, based on the  
2 Horning Penny site.

3 MR. MAURO: So let me see if I --

4 MR. NETON: We already do assign  
5 radon intakes or radon exposures, and that is  
6 documented in the site profile. But it is  
7 going to be adjusted based on new data that we  
8 receive.

9 MR. MAURO: So there are two major  
10 sources of on-site exposures to radon. One is  
11 the early days. There will be actual drums.

12 MR. NETON: Belgian Congo ore, too.

13 MR. MAURO: And there was ore, and  
14 that was separate. So right now in the TBD  
15 the exposures to on-site radon -- am I  
16 correct? -- are limited to this 6,000 curie  
17 per year.

18 MR. NETON: I believe that is  
19 correct.

20 MR. MAURO: Are you saying there  
21 are other sources that need to be factored in.

22 MR. NETON: Right.

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1                   MR. MAURO:     And the Susan Pinney  
2 report is going to help with that.   Okay.

3                   MR. NETON:           That is being  
4 incorporated now.           It's actually in  
5 publication.   It just was released in the  
6 Journal of Exposure or something, assessment.  
7     It was, I know, the NIOSH funded study, by  
8 the way.   That's how I know.   I was the  
9 project officer when I was over in the other  
10 division.

11                  MR. MAKHIJANI:     Can I ask a  
12 question about the radon?   In the response  
13 here NIOSH says that you have radium breath  
14 data for the raffinates, and I presume that's  
15 relating from any intakes from the silos, but  
16 silo 3 had a significant disequilibrium  
17 between thorium-230 and radium.

18                  There's a lot more thorium than  
19 radium, because it was the cold raffinate, and  
20 the radium is already gone, if I remember  
21 right.   I don't have the data in front of me.

22                  So how does radon breath data help

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1 with that, because a lot of the silo 3 dust  
2 would not be reflected in radon breath data?

3 MR. ROLFES: Arjun, this is Mark..

4 If you take a look at the concentration of  
5 thorium-230, we are talking, in silo 3, the  
6 concentration is actually less than the  
7 concentration in silos 1 and 2, based on the  
8 actual measurement data.

9 So if we are using radon breath  
10 data to reconstruct intakes of the raffinates,  
11 and we are applying the concentration that is  
12 shown in silo 1 or 2 to that radon breath  
13 data, it is going to overestimate the actual  
14 exposure from thorium-230 that would be  
15 obtained in comparison to the one that we  
16 would get from silo 3.

17 The caution is that there is  
18 virtually no radium. There is very little  
19 radium concentration in silo 3. So the  
20 approach that we have said we were going to  
21 use would be to use the silo 1 or 2 -- I  
22 believe we said the higher of the two -- in

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1 interpreting those radon breath samples.

2 MR. MAKHIJANI: But workers who  
3 handled silo 3 waste would have almost no  
4 radium. So you won't detect any radon breath  
5 in them. So unless you are talking about  
6 workers who handled waste from all three  
7 silos, I agree, and your scenario will be  
8 claimant favorable. But it would not be for  
9 workers who did not handle -- and silo 1 and 2  
10 -- I mean, silo 1 was just for a couple of  
11 years. Silo 2 also, just in the Fifties. But  
12 in the later years you just had silo 3 being  
13 handled, and I can't see how this method can  
14 be applied to those who handled silo 3 waste.

15 MR. ROLFES: I would have to take a  
16 look back in our interview notes, but as I  
17 recall, workers would have worked on both the  
18 hot side and the cold side of plant 2-3. They  
19 wouldn't have worked in only one side and been  
20 solely exposed to radium depleted materials  
21 per se.

22 MR. MAKHIJANI: But the old

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1 concentrates that came to Fernald were radium  
2 depleted. So the whole process that resulted  
3 in the silo 3 waste was radium depleted. The  
4 radium never came to Fernald. I stayed where  
5 the concentrates were made.

6 MR. ROLFES: No. We just said that  
7 211 was processed, and that was radium bearing  
8 material.

9 MR. MAKHIJANI: Well, no, no, I'm  
10 not talking about the Congo ores. I'm talking  
11 about ore concentrates. Jim Neton, correct me  
12 if I am wrong. You undoubtedly know this  
13 better than me. But as I understand it, silo  
14 3 has materials from the ore concentrates, and  
15 the radium -- ore concentrates themselves are  
16 depleted in radium rather than to thorium.

17 MR. NETON: Yes. I think that is  
18 correct.

19 MR. ROLFES: Yes. It is depleted  
20 in radium and uranium as well.

21 MR. NETON: But I think Arjun's  
22 point is that the material arrived at Fernald

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1 depleted in radium. So if one worked only  
2 with silo 3 material, a radon breath analysis  
3 would not be informative of your exposure to  
4 silo 3 material. That's true.

5 MR. MAKHIJANI: That is my point.

6 MR. MAURO: But I understand -- I'm  
7 listening to this now. But you are saying  
8 that silos 1 and 2 contained radium-226 and  
9 thorium-230.

10 MR. ROLFES: Yes. Correct.

11 MR. MAURO: And thorium -- and they  
12 are in equilibrium, I guess, or close to.

13 MR. NETON: The equilibrium is  
14 pretty well established.

15 MR. MAURO: Pretty well. The ratio  
16 is pretty well established. So now we have  
17 radon breath data for people who worked with  
18 silos 1 and 2. Okay. So we could estimate  
19 the radium-226 intake for that person, and you  
20 are going to assume that the equivalent amount  
21 of thorium-230 was taken in also by that  
22 person. Okay. So that's how you deal with

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1 the people who were exposed to radium-236 and  
2 thorium-230 at silos 1 and 2.

3 Now move over to silo 3. We got a  
4 problem. Let's say all it contains is  
5 thorium-230. Now if the concentration of  
6 thorium-230 in silo 3 is less than the  
7 concentration of thorium-230 in 1 and 2, you  
8 would argue that any dose you calculate for  
9 the people from 1 and 2 from thorium-230 would  
10 be bounding for the people from -- that is not  
11 correct?

12 MR. NETON: No, because you've got  
13 a separate source term here. I mean, you are  
14 missing -- there is no --

15 MR. MAURO: You just changed hats,  
16 by the way.

17 MR. NETON: I know.

18 MR. MAURO: I'm just looking for  
19 the right answer.

20 MR. NETON: Believe it or not, I'll  
21 say what I believe is correct.

22 MR. MAURO: No, I'm trying to

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1 figure out the right answer.

2 MR. NETON: No. You have a  
3 separate source term in silo 3. I mean, it's  
4 an independent source term. So the amount of  
5 radium in your body is totally irrelevant to  
6 how much thorium you could have been exposed  
7 to in silo 3.

8 MR. MAURO: But I heard it said,  
9 though, that any estimate for the intake for 1  
10 and 2 for thorium is going to bound.

11 MR. NETON: No, because you could  
12 have been working on -- it's only going to  
13 bound what was given in silo 1 and 2, but silo  
14 three --

15 MR. MAURO: It might have been much  
16 worse.

17 MR. NETON: You could have five  
18 times more thorium-230 in your body, say, for  
19 example, and not show any radium coming out.

20 MR. MAURO: So you're saying that  
21 workers at silo 3 could have taken in more  
22 thorium than workers at silos 1 and 2?

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1                   MR. NETON:     Well, possibly.     I  
2     don't know.

3                   MR. MAURO:    That's what I heard you  
4     say.    I heard you say somehow you had a hook  
5     on the problem, but maybe you don't.

6                   MR. ROLFES:    I would have to take a  
7     look back.    I know we did discuss this, but  
8     based on interviews, we -- Bryce, I don't know  
9     if you might be able to better answer this  
10    than I.

11                  From     my     recollection,     the  
12    individuals who would have been exposed -- it  
13    wasn't a separate defined process where they  
14    would do only ore concentrates at one time and  
15    radium bearing ores at another time.

16                  From what I understood, both types  
17    of ores, ore concentrate and the radium  
18    bearing ore, would have been processed on  
19    different sides of the plant at the same time,  
20    and those same individuals, because of  
21    external exposure concerns with the radium  
22    bearing materials, would have gone over to the

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1 cold side of the plant to work with some of  
2 the ore concentrates.

3 Does that sound familiar to you or  
4 am I incorrect?

5 That was for Bryce Rich. We don't  
6 hear you, Bryce. If you are out there, you  
7 might be muted.

8 MR. NETON: I still think we need  
9 to go back and look at this issue. Silo 3, if  
10 indeed it came in as depleted radium, we need  
11 to look at the process of what transpired from  
12 arrival on site to entombment, so to speak, in  
13 silo 3 and the potential for exposure and  
14 figure out what we are doing with that.

15 I might be missing something, but I  
16 think we need to look a little better at that.

17 CHAIR CLAWSON: Could we take a  
18 break for 10 minutes?

19 MR. KATZ: A 10-minute break.

20 MR. BEHLING: Can I ask a quick  
21 question before we break? This is Hans.

22 MR. KATZ: Yes, Hans.

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1 MR. BEHLING: Am I to assume that  
2 we are going to assess internal exposures for  
3 silo workers on the basis of radon breath  
4 samples?

5 MR. ROLFES: That is correct.

6 MR. BEHLING: As opposed to what  
7 was discussed in the TBD, because I am  
8 looking at the TBD, and I am looking at the  
9 comment that goes as follows: If sample  
10 datasheets from 1953 time period have been  
11 found and provide insight in the operational  
12 exposures -- and that in essence was the  
13 method that was derived -- that was implied  
14 for use in dose reconstruction.

15 Then it goes on: The only bioassay  
16 information related to internal exposures to  
17 radium or the associate contaminants are a few  
18 radon breath samples in 1953 time period.

19 Am I right in assuming that you are  
20 now going to use those radon breath samples in  
21 lieu of air sampling data?

22 MR. ROLFES: Let me make a

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1 correction to the data that we do have. It's  
2 roughly 200 radon breath samples per year from  
3 1952, 1953 and 1954. I believe we have also  
4 provided a sample dose reconstruction using  
5 those radon bioassay results to reconstruct  
6 raffinate exposures.

7 MR. BEHLING: Are those for K-65  
8 workers exclusively or for everybody?

9 MR. ROLFES: I believe there were  
10 individuals that were working with the K-65  
11 materials and also people that were working  
12 with radium bearing ores in plant 2-3.

13 MR. BEHLING: Do we have a  
14 breakdown as to how many people fall in each  
15 of those categories?

16 MR. ROLFES: We didn't break it  
17 down. We just provided all the data that we  
18 had recovered.

19 MR. BEHLING: I'm just questioning  
20 how it is that in the TBD we refer to the  
21 breath analysis as a very few bioassays, and  
22 now we are, obviously, looking at that data

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1 set for dose reconstruction.

2 MR. ROLFES: At the time of the  
3 Technical Basis Documents' writing and  
4 approval back in 2003, we didn't have as much  
5 data as we do now. Following as part of the  
6 SEC process, we went back and recovered  
7 countless additional records, thousands of  
8 additional records, and those additional  
9 records are now being incorporated into our  
10 files and into the Technical Basis Document  
11 as appropriate for dose reconstructions for  
12 Fernald workers.

13 MR. BEHLING: Okay.

14 MR. NETON: Break time?

15 MR. KATZ: Okay. We are breaking.  
16 We will set up about quarter after.

17 (Whereupon, the above-entitled  
18 matter went off the record at 3:00 p.m. and  
19 resumed at 3:17 p.m.)

20 MR. KATZ: This is the Fernald  
21 Working Group, and we are starting back up  
22 again.

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1 CHAIR CLAWSON: Okay. John, we  
2 are going to -- are we finished with this  
3 part?

4 MR. MAURO: Yes. The only other  
5 point is, you know, we jumped to what I call  
6 task 3 dealing with thorium-232 based on the  
7 derived daily weighted exposure.

8 There were a number of issues.  
9 There were maybe seven or eight, maybe more,  
10 issues that were surrounding that. But I  
11 figure -- but the heart of the matter was the  
12 downloading of the data that NIOSH is going to  
13 do. So might as well just leave that on ice.

14 In other words, let's leave the  
15 thorium DWE issues and all satellite issues.  
16 Maybe we'll just move on to -- move on.

17 CHAIR CLAWSON: Then we have some  
18 action items, though. SC&A was going to write  
19 up the radon.

20 MR. MAURO: Oh, yes. Oh, yes,  
21 sure, the ones we just talked about.

22 MEMBER GRIFFON: Yes, we captured

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1 those.

2 MR. MAURO: Oh, yes. I sort of  
3 jumped right over that, saying where do we go  
4 next.

5 CHAIR CLAWSON: Right. I guess one  
6 of the things -- because I've got to  
7 apologize. I got a little bit confused.

8 The Pinney report is in draft form.

9 MR. NETON: No, no. The Pinney  
10 report is complete. We are working on  
11 incorporating it into the site profile.

12 CHAIR CLAWSON: Okay. But could we  
13 get a -- so that when SC&A does this, I'm  
14 wondering if we could get a copy of that sent  
15 out to the work group or so forth.

16 MR. ROLFES: I want to take a look  
17 to see. I've got a draft report. I've got  
18 the Fernald exposure assessment and a letter  
19 with some slides as well.

20 Now, additionally, there is another  
21 manuscript that was submitted to a journal.  
22 So I've got that from her as well. The letter

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1 is on the O: drive under Fernald Pinney Report  
2 from back in -- let's see -- 2006, correct.  
3 Thank you. These are from August, September  
4 and November of 2006. One is from 2004 as  
5 well, which is the date of the -- by someone  
6 else besides myself.

7 CHAIR CLAWSON: And that is the  
8 same stuff that is going to be implemented  
9 into that, because I know we may have a  
10 report, but I want to make sure that we are  
11 reviewing what is going to be used for the  
12 dose reconstruction.

13 MR. ROLFES: Sure. That hasn't  
14 been documented yet in a report that is  
15 releasable for a website. The Pinney report  
16 CADA is in the NIOSH site research database.  
17 However, we haven't incorporated that fully  
18 into the site profile yet. So as soon as that  
19 is done, we can make that available.

20 CHAIR CLAWSON: To SC&A and the  
21 working group?

22 MR. ROLFES: We can also submit the

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1 manuscripts, if you would like, that have the  
2 raw data and the discussion of the data if you  
3 would like that.

4 MR. MAURO: Okay. Let me  
5 understand. Do I have an action item here?

6 CHAIR CLAWSON: Well, yes, you've  
7 got an action item.

8 MR. MAURO: In other words, the  
9 action item isn't the Susan Pinney report. It  
10 is some other report that is coming out or you  
11 will be providing?

12 MR. ROLFES: It would ultimately be  
13 our site profile.

14 MR. MAURO: Site profile? Okay.  
15 So we sit tight until we see that or do we  
16 start work and take a look at Susan Pinney?

17 CHAIR CLAWSON: Like I said, the  
18 Susan Pinney report, if I remember what I  
19 breezed through it, it explained quite a bit.

20 But what I want to make sure is what we are -  
21 - the portion of it that is going to be used  
22 for our dose reconstruction.

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1 MR. ROLFES: Sure.

2 CHAIR CLAWSON: So sit tight.

3 CHAIR CLAWSON: Sit tight. Yes,  
4 sit tight. What about the silo 3 that we  
5 discussed in there where it was storing  
6 depleted --

7 MEMBER GRIFFON: I have that as a  
8 NIOSH action, that NIOSH is going to evaluate  
9 the ability to reconstruct raffinates,  
10 specifically for silo 3.

11 MR. MAURO: No action.

12 CHAIR CLAWSON: Okay. I asked Jim  
13 off to the side there. There was a Jenkins  
14 report, and I was just going to see if he  
15 could find it out, because it gave a little  
16 bit of information on the radon issue.  
17 Jenkins was out of Mound. I was just going to  
18 see. If he could find it, I would appreciate  
19 it. I just talked to Jim about that. So --

20 MR. MORRIS: What is Mr. Jenkins'  
21 first name?

22 CHAIR CLAWSON: Phil Jenkins. And

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1 this came just merely by accident, because in  
2 a Mound interview we were talking about radon  
3 at Mound, and he started going on to some  
4 information about Fernald and talked about a  
5 report that he had done down there on that.  
6 So --

7 MR. MORRIS: What time frame do you  
8 think that is in, Brad?

9 CHAIR CLAWSON: Probably in the  
10 early eighties is kind of what I got  
11 information from. And if we can't, I just may  
12 -- he just expressed that he had been asked to  
13 come down there and do some measurements  
14 inside of the plants and so forth like that,  
15 that were a little bit different. We are just  
16 going to see if we could find something on  
17 that.

18 MEMBER ZIEMER: Phil still lives  
19 in this area. He lives in Dayton, and he is  
20 listed in the Health Physics Society  
21 directory, if you end up needing to contact  
22 him. I'm not sure what kind of report it was.

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1 Is it an agency report?

2 CHAIR CLAWSON: It was actually in  
3 cooperation with Fernald. He was asked to  
4 come down and do some evaluations.

5 MEMBER ZIEMER: It isn't a "Jenkins  
6 Report" is what I'm asking.

7 CHAIR CLAWSON: No, we are not for  
8 sure, and that is what I was asking Jim to  
9 kind of look into, because it was kind of an  
10 environmental report that he was a part of  
11 that had some information in it.

12 MR. NETON: It sounds like, when I  
13 was talking to Brad, that he might have been  
14 actually measuring the radon in the head  
15 space, just kind of a very specialized thing.

16 MR. MORRIS: I know that Grand  
17 Junction -- GJPO radon staff measured the head  
18 space radon in the mid-Nineties.

19 MR. NETON: I don't know what -- we  
20 could do a search.

21 CHAIR CLAWSON: If we can just do  
22 that, I would appreciate that, and then go

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1 from there.

2 Is there anything that we have  
3 missed, because there is a lot of different  
4 things going on. Anything that you can think  
5 of?

6 MR. MAURO: I just want some  
7 clarification, that we do not have an action  
8 item on the Pinney report or on silo 3. We  
9 are just sitting tight until --

10 CHAIR CLAWSON: Correct, until  
11 NIOSH -- that is in NIOSH's court. Okay.

12 MR. MAURO: Okay. I am going to  
13 move on to --

14 MEMBER GRIFFON: Now were -- I was  
15 going to ask: 4.2-2 and -3, they sort of  
16 overlap the discussion we've had already, but  
17 I don't know if you --

18 MR. MAURO: 4.4 -- yes. We are  
19 about to do 4.4.

20 MEMBER GRIFFON: No, 4.2-2.

21 MR. MAURO: Oh, let me see if we  
22 missed that, 4.2-2.

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1           MEMBER GRIFFON: It is related to  
2 raffinate exposures in plant 2 and 3.

3           MR. MAURO: Yes. I was assuming  
4 that the same issues -- it was the radon.  
5 There was the issue of -- I think your  
6 position was radon breath, and the question  
7 was do you have enough -- that was put to you  
8 -- enough data to be able to reconstruct the  
9 radium intake and the associated thorium  
10 intake based on radon breath data.

11           That would apply to not only -- to  
12 a lot of places where you had, I guess,  
13 raffinates. It had to do, I think, with the  
14 silos or with the opening. There were several  
15 places where you had that.

16           MEMBER GRIFFON: Let me just  
17 understand. Up here I said that there is data  
18 available, and there is a spreadsheet that has  
19 been assembled. Did I get that correct?  
20 Raffinate air data is available in spreadsheet  
21 form, or did I jump the gun on that?

22           MR. ROLFES: No, that was -- I

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1 don't know if that was some sort of --

2 MEMBER GRIFFON: Okay, but there is  
3 radon breath data.

4 MR. ROLFES: I'm trying to think of  
5 an appropriate word, but I think it might have  
6 been from an earlier approach that we were  
7 going to use and like an artifact thing.

8 MEMBER GRIFFON: But radon breath  
9 data is -- I put radon breath data is  
10 available on the O: drive. Now is the  
11 approach -- I mean, how you are going to use  
12 that or where you are going to use that, is  
13 that outlined in that?

14 MR. ROLFES: The radon breath data  
15 is on the O: drive.

16 MEMBER GRIFFON: The data is there,  
17 but is the approach?

18 MR. ROLFES: The interpretation of  
19 radon breath data is documented in OTIB 25.

20 MEMBER GRIFFON: OTIB 25.

21 MR. MAURO: And we reviewed that  
22 and found it positive.

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1                   MEMBER GRIFFON:       And you have  
2 looked at that already?

3                   MR. MAURO:    Looked at that.  We've  
4 reviewed it.

5                   MEMBER GRIFFON:   You looked at it  
6 specifically for --

7                   MR. MAURO:    We looked at it solely  
8 from the point of view of the protocol for  
9 taking radon breath samples and converting  
10 that to whole body --

11                   MEMBER GRIFFON:   So I think SC&A  
12 needs to follow up on that for Fernald.

13                   MR. MAURO:    Okay.  Now that becomes  
14 a new action item now that I did not have.

15                   MR. NETON:     Well, TIB, though, is  
16 not specific to Fernald.

17                   MR. MAURO:    No, it's not.

18                   MR. NETON:     It's a generic radon--

19                   MR. MAURO:    Correct.  That's why I  
20 asked the question.  It sounds like there is  
21 something that you would like us to look into  
22 related to the radon breath data as it applies

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1 to Fernald. I'm not sure what that is.

2 MR. NETON: Well, I guess I want to  
3 understand -- you know, if there is no action  
4 left for NIOSH on that, you know, through the  
5 radon breath data -- In other words, if the  
6 data is there and, based on TIB 25, I should  
7 know how it is going to be applied. Is that  
8 accurate or not?

9 MR. ROLFES: TIB 25 would allow you  
10 to determine an individual's body burden of  
11 radium. Knowing that known body burden, you  
12 can calculate an intake of radium-226, and  
13 from that intake you can --

14 MR. NETON: It is a simple  
15 conversion.

16 MEMBER GRIFFON: But what I'm  
17 asking is what is this -- I mean, radon breath  
18 data -- is it individual data?

19 MR. ROLFES: Yes.

20 MEMBER GRIFFON: Or do you need a  
21 co-worker model for some of these others, like  
22 plant 2-3. I'm reading these findings that

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1 says the data is inadequate.

2 MR. MORRIS: I'm reporting that  
3 there may have been, for 1953, maybe 50 or 60  
4 individual results.

5 MR. ROLFES: Roughly 200 per year,  
6 I think, for '53, '54 and '52.

7 MR. MORRIS: No claim on being  
8 right on those numbers. But we then figured  
9 out -- we fitted it to a distribution and  
10 calculated percentile values that could have  
11 been used then into that TIB 25.

12 MEMBER GRIFFON: So you have sort  
13 of annual co-worker models?

14 MR. MORRIS: Yes, for three years.

15 MEMBER GRIFFON: And they would  
16 apply to what areas?

17 MR. MORRIS: The raffinates area,  
18 plant 2-3.

19 MEMBER GRIFFON: Anybody that was  
20 in those buildings or whatever?

21 MR. MORRIS: Yes.

22 MEMBER GRIFFON: Okay. But I think

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1 you have to review that.

2 MR. MAURO: Did you want us to take  
3 a look at that?

4 MEMBER GRIFFON: Yes.

5 MR. MAURO: Okay.

6 MS. BALDRIDGE: I would like to  
7 make a correction here. If you are trying to  
8 find her report, her name is spelt P-i-n-n-e-y  
9 on here.

10 MEMBER GRIFFON: P-i-n-n-e-y, yes,  
11 I have that in my note. So the radon breath  
12 data also has the -- it's not just the raw  
13 data.

14 MR. MORRIS: No. It was pretty  
15 simple, actually.

16 MEMBER GRIFFON: Pretty simple,  
17 but, yes, there is an approach of a model.

18 MR. MAURO: So the action item is  
19 really -- there is a set of radon breath data,  
20 and with that data there are certain worker  
21 groups at certain time periods that you feel  
22 you can reconstruct the doses -- the

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1 raffinates that contain radium.

2 MR. MORRIS: That's right. That  
3 was all focused on plant 2 and 3 and the  
4 silos.

5 MR. MAURO: And the silos, and  
6 that's the main areas where they could have  
7 had those type of exposures.

8 MR. MORRIS: Right.

9 MR. MAURO: And your question is  
10 check that to see how -- I guess, data  
11 adequacy. It's not the question of the  
12 conversion of radon breath data.

13 MEMBER GRIFFON: For data accuracy  
14 for reconstructing those populations we just  
15 discussed.

16 MR. MAURO: Got it. Okay. I  
17 missed that one. I'm glad you brought it up.  
18 I didn't have that.

19 Issue number four -- five issues;  
20 we are in the home stretch. Number four:  
21 This has to do -- this was discussed at length  
22 at the last meeting, and it has to do with

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1 chest counts where you are trying to estimate  
2 the thorium-232 intake rate based on chest  
3 count.

4 The nature of the discussion that  
5 went forward was you are looking at specific  
6 photons, I think, from one of the progeny of  
7 thorium-232, and from that count you could  
8 estimate the body burden.

9 Now one of the assumptions -- one  
10 of the questions that Hans raised during the  
11 meeting was how you convert those counts to an  
12 intake rate of thorium-232 and associated  
13 doses very much depends on what assumptions  
14 you make regarding the equilibrium between the  
15 radium-232 and its progeny, because that is  
16 what you are looking at, progeny being, I  
17 guess, the radium-228 and then there is  
18 thorium-228.

19 MR. NETON: It's the radium-228.

20 MR. MAURO: Yes, that's what you  
21 are counting.

22 MR. NETON: 220 has got 911 KED.

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1                   MR. MAURO:    Okay, and that's the  
2 one you are counting, but when you have  
3 separated -- I'm thinking about it like this.  
4       Someone just separated in your rate the  
5 thorium from your original ore, and when you  
6 do that, you've got thorium-232 and thorium-  
7 228.   Okay?   And the thorium-228 has 1.9-year  
8 half-life.

9                   Now that is going to start to  
10 decay.   So that's going to start to go away,  
11 and the radium-228 is going to start to come  
12 in.   So it's complex daughters growing in, but  
13 the point being Hans pointed out that,  
14 depending on what assumption you make  
15 regarding the degree of equilibrium between  
16 thorium-232 and its progeny when you make the  
17 chest count, will affect the estimate you are  
18 going to come up with per dose.

19                   The outcome of this is that, well,  
20 push comes to shove, you assume it is full  
21 equilibrium, which is your worst case  
22 condition, as opposed to the assumptions that,

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1 I think, were made, which were not quite some  
2 other stage of equilibrium.

3 As a result, if was at full  
4 equilibrium as opposed to partial equilibrium,  
5 you could underestimate the dose by a factor  
6 of 2.4.

7 It was generally agreed now and  
8 there were also some issues regarding the way  
9 in which the counting was done. It was a  
10 thick crystal versus a thin crystal type of  
11 detector, which was potentially problematic in  
12 your MBAs.

13 In other words, we have a thick  
14 crystal. You might have to count for a longer  
15 period of time, which is --

16 MEMBER ZIEMER: I thought we  
17 eliminated that as an issue.

18 MR. MAURO: That's where I'm  
19 headed. I'm bringing everybody back, that  
20 there was one action item. In other words,  
21 I'm trying to bring everybody up to date.

22 So all of those issues went by the

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1 wayside as an SEC issue. One, push comes to  
2 shove, you make the appropriate corrections  
3 for MBA. Push comes to shove, you make the  
4 appropriate corrections for degree of  
5 equilibrium, so you could place a plausible  
6 upper bound.

7 So everyone agreeing, that's what  
8 it said in the transcript. Not an SEC issue.

9 But there was one item that was left somewhat  
10 open. I'll read it.

11 A review of the transcript -- this  
12 is my notes here -- a review of the transcript  
13 seems to indicate that NIOSH was asked to  
14 follow up and make a clear determination that  
15 the workers that we were chest counting and  
16 are being used to develop a co-worker model  
17 for post-1968 thorium-232 exposures are the  
18 workers that experienced the higher thorium-  
19 232 exposures.

20 So it is not a measure of the -- a  
21 question of the methodology. It is, when you  
22 do have your data and you do come up with your

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1 array of intakes or exposures and you use that  
2 for your co-worker model, what level of  
3 assurance is there that you've captured the  
4 high end of the distribution?

5 That's my understanding of the  
6 question. That's how we left things at the  
7 end of the last work group meeting.

8 MR. MORRIS: What we do know is  
9 that there really were no elevated counts of -  
10 - you know, it's not like you had lots of  
11 exposures that were detectable here. So we do  
12 know from memoranda that were contemporary  
13 with beginning rollout of the mobile in vivo  
14 lab into Fernald that they identified  
15 specifically thorium workers.

16 Then we have found in the dataset  
17 of those first and second year of lung  
18 counting that the thorium workers that were  
19 identified really did get counted, you know,  
20 some minor exceptions of people who were no  
21 longer working there et cetera.

22 So if the question is focused on,

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1 of those 50 or 70 people, were those the  
2 highest 50 or 70 people, I don't think we can  
3 ever answer that question, because the data --  
4 the detection limits were not good enough for  
5 us to actually say there was a big pod of  
6 elevated workers -- elevated lung counts that  
7 are associated with those workers.

8 MR. MAURO: So, if I understand  
9 what you are saying, it is that the workers  
10 that were counted, you feel, there is a high  
11 level of assurance that you caught the higher  
12 ones. In other words, there is some level of  
13 assurance that, because all the workers that  
14 were handling and working with this material  
15 that might have been exposed were chest  
16 counted, and were part of --

17 MR. MORRIS: That's right. We know  
18 from some memoranda that were contemporary  
19 that they actually identified a set of workers  
20 to be early counted in the lung counting.

21 MR. MAURO: Okay, and it is  
22 unlikely that there could have been a group of

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1 workers that could have gotten substantially  
2 higher exposures that were missed?

3 MR. MORRIS: No reason to believe  
4 that, I don't think.

5 MR. ROLFES: Keep in mind that 1968  
6 was the first time anyone from Fernald ever  
7 had a chest count. There were people that  
8 were historically working with thorium that  
9 were sent off-site as early as 1960 time  
10 period that went to the University of  
11 Rochester and provided some thoron breath  
12 analyses that were looked at to determine how  
13 much thorium was in the individual.

14 They were also given a chest count  
15 at the University of Rochester. There were  
16 other trips to Y-12 for a select number of  
17 individuals, as well as a trip to Wright-  
18 Paterson Air force Base, and this is all prior  
19 to 1968. They range from 1960 through 1965  
20 when some of the individuals who had been  
21 working with thorium were sent off-site to see  
22 how much thorium remained within their body.

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1           So we do have that data. When the  
2 individuals began receiving whole body counts  
3 at Fernald, the documentation of their in vivo  
4 count data -- we found, looking through the  
5 data, that a lot of the records had notations  
6 in the top right hand corner.

7           What I did, I pulled all those  
8 notations. You can't see it from here, but it  
9 says "former thorium worker, former thorium  
10 worker, former thorium worker, former thorium  
11 worker." Somewhere in here there is one that  
12 says "current worker, current thorium worker."

13          But I have put a list of all the thorium  
14 workers based on the in vivo datasheets onto  
15 the O: drive. That was placed out there in  
16 October. It was October 16th of 2007, so  
17 roughly a year ago.

18           Additionally, there is -- I've got  
19 some other data here that I am referring to,  
20 also from October of last year. It is a  
21 report of the trip to the University of  
22 Rochester, New York, on November 30, 1962,

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1 with some individuals' names.

2 It says, "These individuals were  
3 sent" -- there's two individuals -- both of  
4 whom had been exposed to thorium in our plant  
5 non-thorium operations. They were sent to the  
6 University of Rochester for breath, thoron and  
7 total body radioactivity measurements.

8 In short, it says the conclusions  
9 and recommendations -- that is some  
10 meaningless background for the trip. This  
11 information -- I don't need to go through all  
12 of it, unless you would like for me to. This  
13 is on the O: drive as well.

14 Furthermore, we did find, as Bob  
15 alluded to, a list of individuals, and I  
16 haven't been able to locate it right here in  
17 my box of records, but there was a list,  
18 roughly a one or two-page list. Do you happen  
19 to have it, Bob?

20 MR. MORRIS: No, I didn't pull that  
21 one up. What I've got is a memo to all NLO  
22 employees from Heatherton. "The following is

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1 information for the purpose of providing  
2 employees with an explanation of some aspects  
3 of the NLO in vivo monitoring program" about  
4 the body counting. And it tells who is going  
5 to get counted and why, and the thorium  
6 workers are in that.

7 MR. BEHLING: This is Hans Behling.

8 I just want to make a comment, because I  
9 think this addresses the finding in 4.4-3 in  
10 my report, and the reason why I rate that as  
11 an issue, because in a given memo that was  
12 issued in '68, I believe, in a Health  
13 Protection Appraisal report, the following  
14 statement appears, and I will read it for you.

15 "Recent in vivo monitoring of NLO  
16 employees utilizing the IDRML indicated eight  
17 employees occurring sustaining 70 to 100  
18 percent over permissible lung burden of  
19 uranium. A serious question has been raised  
20 regarding the validity of the job, suggesting  
21 that the lung exposure for these employees in  
22 vivo indicated a level that probably was not

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1 expected," meaning that the use of air  
2 sampling data was used to identify candidates  
3 for high exposures which, it turns out, would  
4 not have suggested that these individuals  
5 should have had lung burdens ranging from 70  
6 to 80 percent permissible levels.

7 So I think that was the reason why  
8 I questioned the whole issue of whether or not  
9 the people who were maximally -- potentially  
10 maximally exposed were, in fact, the people  
11 who were actually counted.

12 I think it goes to John's question.

13 MR. MORRIS: Well, John, more  
14 specifically in response to what Hans just  
15 said, in this Heatherton memo each employee's  
16 potential for inhaling uranium or thorium  
17 determines if and how often they will be  
18 counted.

19 For example, a water plant worker's  
20 potential for exposure is practically nil, and  
21 they are not included in the routine in vivo  
22 counting program. Chemical operators who work

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1 daily with uranium or thorium have the  
2 greatest chance of accidentally inhaling these  
3 materials, and are counted at least once each  
4 year.

5 Workers with only a slight  
6 possibility for such exposure, such as  
7 mechanical employees, are monitored about  
8 every other year. Of course, any employee,  
9 regardless of classification, would be counted  
10 if air dust data or milling results indicated  
11 elevated exposure levels. If an employee was  
12 involved in an incident which might have  
13 caused significant exposure to airborne  
14 uranium or thorium, they would also be  
15 counted.

16 MR. MAURO: I think I hear where we  
17 are on this. That is, our concern was that  
18 the air sampling data alone was not  
19 necessarily a good enough indicator of who  
20 might be having been exposed.

21 Your retort is that, well, that  
22 wasn't the only criteria used to determine who

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1 was going to be chest counted, and you listed  
2 a number of criteria just now which go above  
3 and beyond just air sampling.

4 I guess, you know, that's your  
5 response, and I don't know if that is  
6 satisfactory to the work group, whether or not  
7 that is your criteria. In other words, there  
8 was a full array of criteria, job  
9 descriptions, urine analysis, and air  
10 sampling, all of which triggered -- and  
11 incidents -- which would trigger when a chest  
12 count would be taken.

13 MR. MORRIS: Right.

14 MR. MAURO: So you are saying,  
15 given those criteria, it is unlikely that  
16 there were any or very many people who could  
17 have experienced a high level of thorium  
18 exposure and were missed by the chest count  
19 program. That's what I --

20 MR. MORRIS: Right.

21 CHAIR CLAWSON: I guess I am just  
22 kind of coming from the question. That sounds

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1 great on paper, but was it really done?

2 MR. MORRIS: We looked at that,  
3 Brad, and in fact, the thorium workers were  
4 brought in in the first year when things were  
5 available to use the counter. They actually  
6 did get counted in greater numbers.

7 We found the memo identifying  
8 thorium workers, and we then went back into  
9 the first year of data, and they were counted,  
10 to a large degree. Most of them were counted  
11 in that first year when the mobile lab was  
12 available.

13 MEMBER GRIFFON: When you say  
14 thorium workers, that's different than what  
15 you just described in those criteria. They  
16 were talking about chemical --

17 MR. MORRIS: But there was a prior  
18 population of, you know, people that had  
19 worked thorium chemical processes in prior  
20 years. They identified them early on and  
21 said, when the lab becomes available, let's  
22 count these guys.

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1                   MR. ROLFES:       The main thorium  
2                   campaign at Fernald in the early days was in  
3                   Plant 9, 1954-1955, and they produced roughly  
4                   30 percent of the thorium that Fernald ever  
5                   produced. It was that population of workers  
6                   that they focused on when they brought the  
7                   mobile in vivo unit to the site.

8                   There was a memorandum actually  
9                   shortly thereafter, shortly after the in vivo  
10                  unit came, saying that these were the  
11                  individuals who would have had the potential  
12                  for exposure to thorium. They were working in  
13                  Plant 9, and they were largely unmonitored  
14                  during those years.

15                  They were concerned about the  
16                  amount of thorium potentially building up or  
17                  that had built up in their bodies, and they  
18                  wanted to prioritize those individuals for a  
19                  whole body count or for a mobile in vivo  
20                  count.

21                  MR. MORRIS:    And then when you do  
22                  see the logbook from the in vivo counting

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1 laboratory data, there will be a notation on  
2 the page that says "Thorium worker."  
3 Oftentimes, that exactly matched that list.

4 MR. ROLFES: That document -- I  
5 scanned those lists -- that listing of in vivo  
6 count datasheets for the individuals who had  
7 that notation on their open safety in vivo  
8 count datasheet and put it onto the O: drive.  
9 It's titled "List of Thorium and Former  
10 Thorium Workers at FMPC."

11 MEMBER GRIFFON: And then what is  
12 the approach for other workers that were in  
13 Plant 9 during that time period? I'm just  
14 guessing that there were maintenance people in  
15 and out of there or others. These are  
16 probably the routine chem op thorium workers,  
17 but is the approach to use --

18 MR. MORRIS: That is where the DWE  
19 reports come in. Right.

20 MEMBER GRIFFON: That is covered in  
21 that part.

22 MR. MAURO: Well, the DWE reports -

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1 - that was for the pre-'68.

2 MR. MORRIS: Yes.

3 MR. MAURO: But now it is all from  
4 post-'68.

5 MR. MORRIS: I misunderstood the  
6 question. I'm sorry.

7 MR. MAURO: What I thought I heard,  
8 it was post-'68, you got yourself a collection  
9 of workers that you believe may have been  
10 exposed to thorium, and you have identified  
11 them as potential thorium workers. You do a  
12 chest count. You have a dataset of those  
13 workers.

14 Now you are in a position where you  
15 can do dose reconstruction for those workers.

16 MR. MORRIS: Right.

17 MR. MAURO: But there are a lot of  
18 other workers that might have been working in  
19 that area or near the area that were not  
20 checked. Now do you assume that they might  
21 have gotten exposed?

22 MR. MORRIS: There is a good answer

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1 for this. We developed a co-worker model off  
2 of that data, that in vivo dataset, and that  
3 you will find on the O: drive.

4 MR. ROLFES: It is on the O: drive,  
5 and that is titled "The Fernald Thorium In  
6 Vivo Co-Worker Study Final Draft.."

7 MR. MAURO: Okay. That's post-'68.  
8 Okay.

9 MR. ROLFES: They are on March 12,  
10 2008.

11 CHAIR CLAWSON: That would be an  
12 action item.

13 MR. MAURO: Got it.

14 MR. GRIFFON: I guess, again,  
15 that's the same age-old problem, but how do  
16 you determine if someone was -- if someone  
17 gets that dose assigned.

18 MR. ROLFES: In the worst case  
19 scenario, you would assume that they were a  
20 thorium worker, and by --

21 MEMBER ZIEMER: Based on building?

22 MR. ROLFES: We certainly could do

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1 that, if an individual said that they worked,  
2 for example, in Plant 9 and were not monitored  
3 -- well, let's keep it in the -- let's say in  
4 the more recent years there were some thorium  
5 campaigns in the pilot plant.

6 If an individual said that they  
7 worked with thorium in the pilot plant and  
8 never had a whole body count, we can say,  
9 okay, what job category? If they were in a  
10 high potential exposure job category such as a  
11 chemical operator, we could apply, you know,  
12 the 84th or the 95th percentile or whatever as  
13 well.

14 You can also consider an  
15 individual's external dose, the penetrating  
16 dose. Usually, those individuals have a  
17 little bit higher peak dose than standard  
18 uranium workers as well.

19 MEMBER GRIFFON: That is assuming  
20 the individual didn't -- I mean, we have a lot  
21 of cases that you don't have the individual to  
22 talk to. So --

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1 MR. ROLFES: Right.

2 MEMBER GRIFFON: Then do you have -  
3 - I don't know if you have a detailed  
4 employment card for this site or you would  
5 know if they went in and out of those areas,  
6 or how do you -- when you are saying worst  
7 case, I'm saying best estimate, you know.

8 MR. ROLFES: Well, let's keep in  
9 mind -- because we are -- best estimates that  
10 we actually do, that's a very, very small  
11 population of our total claims that we can do  
12 dose reconstructions for, maybe one percent of  
13 that.

14 For Fernald, specifically, I really  
15 don't know of any best estimates that we've  
16 ever done for Fernald. I don't know if we  
17 have completed one, and usually we make  
18 claimant-favorable assumptions in a best  
19 estimate that are still giving the benefit of  
20 the doubt to the claimants.

21 MEMBER GRIFFON: Well, if you are  
22 going to make worst case for everybody, that

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1 makes this go away, this discussion.

2 MR. ROLFES: I think, as Jim had  
3 mentioned earlier --

4 MEMBER GRIFFON: If you are only  
5 going to do it for prostate cancers, that's a  
6 different thing.

7 MR. ROLFES: Right. For example,  
8 for a lung cancer, if we were to use even a  
9 small partial dose reconstruction, a small  
10 intake for one year, for example, at the 50th  
11 percentile could result in greater than 50  
12 percent. But in the dose reconstruction  
13 process, before we would even really consider  
14 thorium exposures, we would take a look at the  
15 bioassay data that we do have for the  
16 individual.

17 For example, we would start the  
18 dose reconstruction for lung cancer by looking  
19 at essentially all the data that we have, and  
20 then start with the bioassay data that we do  
21 have, and complete an internal assessment  
22 using that uranium bioassay data.

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1           If it was not over 50 percent, then  
2 we would have to consider some of the other  
3 radionuclides to which the individual was  
4 potentially exposed, and the next one on the  
5 line would likely be the thorium issue.

6           So we could apply a 50th percentile  
7 based on the data that we do have. We would  
8 have to examine the facts of the case in order  
9 to make an informed decision.

10           MR. MAURO: And that is all written  
11 up in the co-worker model. In other words, is  
12 that all written up?

13           MR. ROLFES: The thorium intake  
14 model is presented in the Fernald Thorium  
15 Intake Model here.

16           MR. MAURO: The rationale for who  
17 you assigned what percentile to is described  
18 in the co-worker model?

19           MR. ROLFES: Let me open it and  
20 take a look.

21           MR. MORRIS: It's been a long time  
22 since they wrote that.

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1 MR. MAURO: I realize you didn't  
2 memorize all 300 procedures.

3 MR. ROLFES: This is from January  
4 8, 2008, the date that we have on it. Let's  
5 see.

6 MEMBER ZIEMER: That's awfully  
7 recent. It should be right there.

8 MR. ROLFES: Sorry. Sorry. Let's  
9 see, it's the thorium in vivo co-worker study  
10 for Fernald, and it's 19 pages. We go through  
11 a little bit of the decay of thorium, the  
12 selection, statistical description of the  
13 data.

14 MR. NETON: I guess it probably  
15 doesn't say.

16 MR. ROLFES: It might just call out  
17 what the specific intakes are based on the  
18 matrix.

19 MR. MAURO: Once you decide who you  
20 want to give it to. That's the big ticket  
21 item.

22 MR. NETON: Well, that's the TIB

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1 that I just talked about earlier that refers  
2 to what job categories are given what level of  
3 exposure based on administrative, clerical --

4 MR. MAURO: That's an overarching  
5 philosophy.

6 MS. BALDRIDGE: Can I ask a  
7 question here? When you are talking about  
8 clerical or any of those people that were  
9 considered working in offices, where did the  
10 draftsman, the draftsman or an engineer  
11 fall into, what category?

12 MR. NETON: It depends on where  
13 they worked. I mean, what they did. A  
14 draftsman who worked only in the non-process  
15 area would fall in the ambient exposure  
16 category.

17 MS. BALDRIDGE: How do you know  
18 they worked in a non-exposure area?

19 MR. NETON: If you don't, then they  
20 would be given the benefit of the doubt and  
21 could receive up to the 50th percentile of the  
22 worker exposed.

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1 MS. BALDRIDGE: Especially based on  
2 the Fernald documents that state design  
3 problems, you know --

4 MR. NETON: Well, when it is not  
5 known --

6 MS. BALDRIDGE: -- maybe breaking  
7 down, where engineers had to go in and try to  
8 solve design problems to make a safer  
9 environment, they were at risk by the very  
10 exposure that --

11 MR. NETON: Well, when it is not  
12 known to any certainty, they would be given  
13 the 50th percentile of the co-worker's doses,  
14 but for uranium exposures, typically, most  
15 people have at least one bioassay sample a  
16 year, because for many years it was part of  
17 the annual physical, for uranium.

18 Now when you get in the other  
19 scenario, the thorium and radon, it's a little  
20 different issue, but when there is a benefit  
21 to conducting that procedure, that the 50th  
22 percentile would be the exposure.

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1           Then for those who were really  
2 hands-on workers working with material,  
3 grinding, lathing and processing, then those  
4 would be given a higher level exposure than  
5 that.

6           MS. BALDRIDGE: You know, as I look  
7 at the lists that I've seen in some of the  
8 documentation already, it was like inspectors  
9 were at the bottom of the list. They were  
10 expected to have the least exposure when some  
11 of the processes involved taking chemical  
12 samples, core specimens of slugs. They were  
13 working on the machines to do some of this  
14 stuff. To put them not off, just counting how  
15 many cartons were leaving or how many boxes  
16 were leaving, and there's other examples.

17           When you list it as a category and  
18 then you are talking about assigning --

19           MR. ROLFES: Those are guidelines,  
20 not absolutes, for those procedures. They are  
21 a starting point, but you have to look at the  
22 entire file and look at the individual and the

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1 interviews and the bioassay samples that were  
2 taken and the work areas that were frequented  
3 based on the job categories.

4 There's a lot that goes into this  
5 other than just that starting point.

6 CHAIR CLAWSON: Okay. Go on.

7 MR. MAURO: We are almost through  
8 the fourth out of five.

9 The last part of the chest count  
10 issue and thorium issue has to do with -- I'll  
11 read the statement, the improper correlation  
12 of the chest count at the MIVRML, whatever  
13 that stands for -- I assume that's the chest  
14 count, thorium lung count -- with the air  
15 sampling data.

16 Now the issue goes toward -- it  
17 sounds like you've got data from chest counts,  
18 and you also have data from the derived daily  
19 weighted exposure together, which raises an  
20 interesting situation.

21 You've got two separate sources,  
22 two different approaches post-1968. Now when

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1 you discussed at the last time, and we asked,  
2 well, which one are you going to use, the  
3 answer was, well, when we have the chest count  
4 data, we use that, which, of course, is in  
5 accord with the overall hierarchy of data.

6 What came to mind, though, was what  
7 happens -- well, you are in a unique situation  
8 now. You could actually validate your derived  
9 -- the daily weighted exposure. In other  
10 words, you are going to be using the daily  
11 weighted exposure pre-'68 as your method for  
12 reconstructing internal doses of thorium,  
13 which -- and, you know, you are going to  
14 demonstrate to us how you do it and all the  
15 data, and that is something in the future you  
16 can put on the O: drive.

17 Something we didn't talk about was,  
18 when you -- post-'68 apparently you need them  
19 both, and one way to confirm that you could  
20 trust the daily weighted exposure is to show  
21 that it works well post-'68.

22 MR. MORRIS: One thing you could

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1 say about that is we already know that the  
2 daily weighted exposures were significantly  
3 overestimates of the true exposure.

4 CHAIR CLAWSON: Compared with the  
5 lung data.

6 MR. MAURO: Is that right?

7 MR. MORRIS: We already know that,  
8 because we already know that --

9 MR. MAURO: That's important.

10 MR. MORRIS: -- there was never a  
11 counting for respiratory protection daily  
12 weighted exposure measurements, and we know  
13 that people did wear respirators. So just  
14 that fact alone would skew it.

15 MR. MAURO: That's where I'm  
16 heading with this. You see, the day is going  
17 to come when we are going to be looking real  
18 hard at the DWE data, and that is going to be  
19 a critical factor in terms of the SEC related  
20 issues. Can you reconstruct now?

21 MR. NETON: There is also very good  
22 evidence -- I think it has been published --

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1 that the air concentration data doesn't match  
2 very well, because it is not particle size  
3 selective either. I mean, when you do an air  
4 sample, you suck in everything from boulders  
5 down to ultra-fine aerosols.

6           Somebody actually did a study at  
7 Fernald where they looked at -- you know,  
8 cascade of macro studies, and you  
9 significantly overestimate exposures using the  
10 entire air sample.

11           MR. MAURO: If that can be part of  
12 the package in terms of not only do you  
13 demonstrate that here is all the data we have  
14 -- in other words, here is all the data we  
15 have pre-'68. In other words, when you do the  
16 1955, 1966 sample for every building and you  
17 show you have an abundance of data with which  
18 to construct -- do dose reconstruction and  
19 construct a co-worker model for thorium  
20 intake, you also could demonstrate that, and  
21 we know that when we do it this way, it is  
22 claimant favorable, because it usually always

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1 results in overestimate.

2 The reason we can say that is for  
3 the reasons you just gave.

4 MR. NETON: Right.

5 MR. MAURO: That would -- I just  
6 messed up. I just went too far.

7 MEMBER GRIFFON: It's getting late  
8 in the day, and I can't reach you to kick you.

9 MR. MAURO: I'm sorry.

10 MEMBER GRIFFON: There's other  
11 factors. I don't disagree with what Jim said.

12 The other factor that I looked at when we  
13 first discussed that study was do you have  
14 daily weighted averages, and in some cases for  
15 some job titles I saw, it was like a value of  
16 five in 4,000, and it was averaged to about  
17 2,000, and that's the value that you are  
18 plotting.

19 So there's some -- I want to see  
20 what is happening with this data.

21 MR. NETON: I think you will be  
22 happy with that, because I reviewed that

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1 dataset, and it would go into the higher end.

2 We're not taking averages.

3 MEMBER GRIFFON: Okay. Anyway,  
4 until we see this --

5 MR. MAURO: I got carried away.

6 MR. NETON: A guy may have only  
7 worked that job -- you don't know how many  
8 days the guy worked that job, too. I mean,  
9 that's for a guy full time working that job  
10 one day a week, two days a week, five days?

11 MEMBER GRIFFON: But I also don't  
12 know how often that -- was that one day for  
13 the year, the sampling of it? I don't know.

14 MR. MORRIS: For highly exposed  
15 jobs, they sampled, you know, a few times  
16 during the year. That was the typical --

17 MEMBER GRIFFON; I haven't looked  
18 at it. So you know more than I do, but I am  
19 just saying let's wait until we see it.

20 MR. MORRIS: In fact, if you ever  
21 took an industrial hygiene class and the  
22 theory of how you do industrial hygiene

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1 sampling was presented to you, this is how  
2 they did it. They really did it that way, and  
3 you would find that there was a journal of who  
4 did what, how many minutes they spent on that,  
5 how many minutes they spent on this, how long  
6 they were at work.

7 MEMBER GRIFFON: No, I don't  
8 disagree with it for that individual. It's a  
9 pretty good assessment.

10 MR. MORRIS: It's not for the  
11 individual. It's for the work, the work task.

12 MEMBER GRIFFON: Anyway, there is  
13 some interpretation there, because I know I  
14 have done some of these, and they are not  
15 invasive, and they are also -- you know, when  
16 you are looking over the shoulder of these  
17 people doing this, you are not sure you are  
18 getting it the way all of the work is always  
19 done, as they tell you later, well, we did it  
20 that way when everybody was watching us.

21 MR. KATZ: Arjun, you had wanted to  
22 speak.

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1 MR. MAKHIJANI: Yes. Sorry, I  
2 can't hear everybody. So I don't know when  
3 exactly to speak. Thank you, Ted.

4 I have a question about the in vivo  
5 counter, the specific measurements you get out  
6 of it. I think you were measuring titanium  
7 and lead-212. But that lead-212, is a product  
8 of control rods, and so I am wondering how you  
9 actually reflect that lead-212 back into  
10 thoron-232 when you don't know how much thoron  
11 has actually escaped.

12 In different circumstances, the re-  
13 drumming may be a different situation than in  
14 processing.

15 MR. NETON; I think, Arjun, this  
16 is something that we need to go back and look  
17 at. I don't remember the algorithm that was  
18 exactly used, but I think it was a combination  
19 of actinium and a lead-212 somehow, and I have  
20 forgotten exactly how that was derived and  
21 what they did with it. But you're right.  
22 Thoron gas does escape from the body to some

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1 degree, although albeit not a lot, because  
2 it's got a 55-second half-life.

3 MR. MAKHIJANI: Yes, but the thing  
4 that concerns me is the significant weight of  
5 that 212 -- radiological or gamma, and the  
6 emission characteristics and, you know, I  
7 don't know all the radiochemistry on the top  
8 of my head.

9 MR. NETON: Well, but there have  
10 been papers published on this issue, like how  
11 representative lead-212 as a measurement of  
12 thorium in the lung.

13 MR. MAKHIJANI: I am just thinking  
14 that the thing that needs to be clarified in  
15 this process is at what point does it affect  
16 your measurement and your attribution.

17 MR. BEHLING: Can I interject here?

18 MR. MAKHIJANI: A lot of negative  
19 measurement and a lot of measurements that  
20 seem to be below some level of detection or  
21 very low, a negative number, and that kind of  
22 concerns me.

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1                   MR. BEHLING:           Arjun, can I  
2 interject, because you raised that question  
3 with me earlier. Whenever you -- obviously,  
4 the in vivo measurement chest counting tried  
5 to test both the activity associated with  
6 actinium-228 as well as with lead-212, and if  
7 you have -- you always have a pretty good  
8 understanding of what the thorium-228 is,  
9 because it is very closely always in  
10 equilibrium with lead-212, because the  
11 intervening daughters are very short-lived.

12                   If you start out with a pure sample  
13 of purified thorium at time zero, you can  
14 reasonably assure yourself that the thorium-  
15 232 and 228 are in equilibrium. However, you  
16 won't know that, because the actinium-228 is  
17 actually going to be zero, because it is a  
18 very short-lived daughter of radium-228, which  
19 has been chemically removed.

20                   So at times zero the only real  
21 measurement you have -- if you know for a fact  
22 you are dealing with a very, very fresh sample

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1 and the only measurement you are going to get  
2 out of that is lead-212, because you can  
3 reasonably conclude that within days of  
4 thorium extraction that the lead-212 is once  
5 again in equilibrium with the thorium-228.

6           What you don't know is if thorium-  
7 228 is in equilibrium with thorium-232. So  
8 this is one of the handicaps. And of course,  
9 as time goes by, you will, obviously, have an  
10 in-growth of radium-228, which is the first  
11 daughter decay product of thorium-232, but you  
12 will not have a full equilibrium of the  
13 radionuclides you are trying to measure, 228,  
14 for about 30 years.

15           So there is always this disconnect  
16 between thorium -- the lead-212 and actinium-  
17 228, because they have very different  
18 relationships to their parent, which is what  
19 you are trying to measure.

20           At the worst condition, is  
21 approximately three or four years after  
22 extraction where you bottom out in terms of

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1 understanding what the relationships are, and  
2 you could be off by as much as 2.3 or 2.4, and  
3 I think John mentioned that number, in  
4 underestimating your actual body burden.  
5 That's the worst it can ever happen.

6 MR. NETON: But, Hans, I think that  
7 is what that algorithm attempted to do, was --  
8 you know, if you start seeing actinium-228,  
9 you know that you are dealing with an aged  
10 sample.

11 MR. BEHLING: Yes, exactly.

12 MR. NETON: And then you can  
13 correct for that, and you are right. The  
14 worst case without any correction for actinium  
15 ingrowth would be, you know, 2.3 or 2.4 or  
16 something like that. This is an issue we've  
17 just -- we talked about earlier, I think.

18 MR. BEHLING: Yes, we did.

19 MR. MAKHIJANI: The point I was  
20 trying to make was somewhat different.

21 MR. NETON: Yes, I know. You are  
22 talking about the escape of thoron gas from

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1 the body, but I think that that is -- well, I  
2 could point to some papers that have  
3 investigated this, and we can shore that up a  
4 little bit.

5 MR. MAKHIJANI: I am just wondering  
6 how that would take into account, because  
7 there are a lot of different thorium  
8 processes, and people's thoron must be very  
9 different in different circumstances.

10 MR. NETON: Correct.

11 MR. MAKHIJANI: In your sample,  
12 they say, you know, five or ten years old. It  
13 may not have a lot of -- you know, five years  
14 old, you now have a lot of actinium, and you  
15 may not have much lead-212. So I just am  
16 wondering as to -- well, I think we need to  
17 verify --

18 MR. NETON; Yes. We can work on  
19 that.

20 MR. MAKHIJANI: Great. Thank you.

21 MR. MAURO: This is just a matter  
22 of housekeeping. We actually had an issue

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1 number 4.4-5. It is the last of the 4.4  
2 series. That had to do with OTIB-0002.

3 At the time of our review of the  
4 site profile and the evaluation report, I  
5 believe that -- this was not discussed at the  
6 last meeting. It was discussed at the October  
7 24, 2007, meeting, and it had to do with under  
8 what circumstances is OTIB-0002 at play.

9 I think that the events have  
10 overcome us, and that is no longer an issue.  
11 I don't think OTIB-0002 is used in any  
12 respect. This is just bounding analysis.

13 I think at one time this default  
14 intake that is embedded in OTIB-0002 was a way  
15 that you would bound -- place an upper bound  
16 on some internal exposures that may not have  
17 been bounded for some of the exposure  
18 experience at Fernald. That was some of our  
19 concerns. But I don't think that has anymore  
20 play.

21 In other words, I don't think you  
22 are using OTIB-0002 for any of the dose

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1 reconstruction at Fernald any longer, and I  
2 just wanted to confirm that, and we could then  
3 close this particular item out.

4 MR. NETON: Mark is more familiar  
5 with the day to day dose reconstruction, but I  
6 don't think we would use 0002.

7 MR. ROLFES: You know, there may  
8 have been some revisions. You know, if we  
9 issued a program evaluation report for Fernald  
10 and we had basically reviewed the dose  
11 reconstruction -- I couldn't really answer  
12 directly.

13 I don't recall off the top of my  
14 head. We could find out.

15 MR. NETON: We could take that as  
16 an action item and verify.

17 MR. MAURO: That was your last  
18 action item. In fact, at the end of the  
19 meeting a year ago, it said: NIOSH response:  
20 A formal PER is performed for previously  
21 denied claims -- if you denied a claim based  
22 on this 0002. This would be done after the

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1 site profile revisions have occurred.

2 So apparently, as I understand it,  
3 this comes right out of the matrix after we  
4 had a meeting a year ago.

5 MR. NETON: We need to look at  
6 that, because I am not aware -- I'm sorry.

7 MS. BALDRIDGE: I think that  
8 applies to my father's claim, because I was  
9 challenging the use of OTIB-0002, which is  
10 time sensitive, and the revision -- or the  
11 original OTIB-0002 had a time restrictive  
12 application that you had to have been hired in  
13 1969 or later.

14 OTIB-0002 was applied to my father,  
15 who retired in 1964. The use of that also did  
16 not dose him for the uranium hexafluoride, and  
17 did not take into account the thorium that we  
18 later discovered in Plant 6.

19 So my question to Mark at the time  
20 was: If this document is time restrictive,  
21 how do you justify using it to do a dose  
22 reconstruction for someone who doesn't fall

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1 under the limitation parameters of the  
2 document, and he told me sometimes it is  
3 necessary to do dose reconstruction.

4 I thought, well, I thought the law  
5 had the stipulation that if NIOSH didn't have  
6 the data, the information that they needed,  
7 then it was to be referred to the Department  
8 of Labor who would, in fact, then tell you to  
9 go ahead and apply for an individual SEC based  
10 on the fact that there was no documentation.

11 MR. ROLFES: I think the concern  
12 was that, because the TIB 2 at the time had a  
13 restriction in there that limited its usage to  
14 1970 forward -- I think we've revised that to  
15 say that that can be used for earlier time  
16 periods with specific justification for a  
17 claim.

18 MS. BALDRIDGE: It was revised, but  
19 the document that was used for my father's  
20 dose reconstruction was not the revision. It  
21 was the original that still contained the time  
22 restriction.

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1 MR. ROLFES: I don't want to speak  
2 about your claim, but --

3 MS. BALDRIDGE: Since OTIB-0002  
4 came up, that's why.

5 MR. ROLFES: Okay. As we  
6 indicated, though, it has been revised to  
7 basically explain that it can be used with  
8 specific justification on a case by case  
9 basis. I believe that is documented in there.  
10 Is that correct, Jim?

11 MR. NETON: I don't remember now.  
12 I can't recall, but I'm concerned about the  
13 PER that was talked about, because I don't  
14 recall us doing a PER for 0002.

15 MR. ROLFES: What I was going to  
16 explain is that, if we had a dose  
17 reconstruction that was completed using TIB 2  
18 and we had a program evaluation report that  
19 was issued, we wouldn't change the  
20 methodology. We would likely use TIB 2 once  
21 again, if we had to reevaluate the claim. But  
22 I'm not sure of that.

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1                   MR. MAURO:     Maybe I can help a  
2 little bit. It was my understanding that TIB  
3 2 was used for denials. In other words, it  
4 was, across the board --

5                   MR. NETON: Overestimate.

6                   MR. MAURO:     -- overestimate, just  
7 to put the value, internal dose, now. And  
8 then subsequent to that, we did some reviews  
9 of TIB 2 in the default set of radionuclides  
10 and intakes embedded in it, and it was our  
11 finding that, when it comes to Fernald, that  
12 may not be bounding..

13                  MR. NETON: Yes, and I think what  
14 would happen was, if we did a review of a  
15 case, and it came back through, it would not  
16 be TIB 2, because that was written at a time  
17 probably when the site profile for Fernald had  
18 not been completed or something of that  
19 nature; because if there is a site profile and  
20 there are prescribed approaches to doing dose  
21 reconstructions, we would always default to  
22 the site profile. But early on, when we were

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1 doing dose reconstructions, we believed that  
2 you could deny cases using the TIB 2, because  
3 it was bounding. Apparently SC&A had some  
4 issues with some of the --

5 MR. MAURO: Some concerns, right.

6 MR. NETON: -- some of the  
7 approaches that we used. But I'm not sure  
8 where we are at with that, other than the fact  
9 that I don't think TIB 2 would be used  
10 currently.

11 MEMBER GRIFFON: I guess, if NIOSH  
12 ended up agreeing with SC&A that it is not  
13 bounding for Fernald, that TIB 2 is not then a  
14 PER, that would be done.

15 MR. NETON: Yes, that would be the  
16 case, but see, I don't know that we --

17 MEMBER GRIFFON: But I don't think  
18 we are that point.

19 MR. MAURO: We have just left it  
20 off, the same place we left it off a year ago.

21 MR. NETON: Have we responded to  
22 the TIB 2 review yet or is that still in the

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1 Procedures Group process? I guess that is the  
2 question. I don't know where we are with the  
3 review of TIB 2.

4 MR. MAURO: I don't know.

5 MR. NETON: We would have to look  
6 at that. And you're right. If the Procedures  
7 Review Group made a determination, we agree  
8 that TIB 2 is inappropriate for certain cases  
9 at Fernald, then a PER would be issued. We  
10 would go back and, more than likely, it would  
11 be not -- all those cases --

12 MEMBER GRIFFON: I don't think the  
13 Procedures Review Work Group would look at  
14 specific sites. Wouldn't that be deferred to  
15 this group to see if Fernald --

16 MR. NETON; Yes, but where did the  
17 analysis of TIB 2 against Fernald cases come  
18 from?

19 MEMBER GRIFFON: I think it came up  
20 here, didn't it?

21 MR. MAURO: Yes, we have this as a  
22 finding. We can go back; we could find the

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1 history of it.

2 MEMBER GRIFFON: And I think this  
3 is something that we got to say, you know,  
4 does NIOSH agree with SC&A's finding or no.

5 MR. MAURO: And we have not  
6 responded to that, apparently.

7 MR. ROLFES: I am trying to think  
8 about some of the claims process. You know,  
9 for example, if we have an individual who has  
10 bioassay data, and that individual's bioassay  
11 data are largely unremarkable, has no greater  
12 than the detection limit results, TIB 2 would  
13 be a bounding approach, and that approach  
14 would typically be used for a non-metabolic  
15 organ -- for cancer of a non-metabolic organ,  
16 for prostate cancer.

17 MR. NETON: I am not sure about the  
18 nuclide mix. I think we need to go back and  
19 revisit it.

20 MR. MAURO: Well, fission products.  
21 Reactor mix, you name it.

22 MR. NETON: I thought it was

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1 uranium.

2 MR. MAURO: There were two mixes.  
3 There are two mixes, yes.

4 MR. NETON: But I am not certain  
5 whether it incorporated some of the issues  
6 that we are talking about today, like the  
7 thorium and then the radon and that sort of  
8 thing. We need to go back and read it. Sorry  
9 for our response.

10 MR. MAURO: We are on the last  
11 finding, 5, dealing with external dosimetry.  
12 Let me see where we are on this. Give me a  
13 second. I didn't think we would get this far.

14 In fact, from the --

15 MR. MAKHIJANI: John, did you deal  
16 with the Parker Report?

17 MR. MAURO: Oh, yes, thank you.  
18 Thank you. There are a number of findings on  
19 what I call the external dosimetry, 4.5-1  
20 through 4.5-5.

21 The first one has to do with  
22 quality assurance. Namely, we had a finding

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1 that questioned the program -- the quality  
2 assurance of the program, the training of the  
3 workers in terms of NIOSH being in a position  
4 to put out quality data related to externa  
5 dosimetry.

6 The response at the time by NIOSH  
7 was, well, Herb Parker put a report out that  
8 demonstrates that the quality data is okay.  
9 Hans, in fact, you may want to take it from  
10 here. Hans faxed me last night the Parker  
11 report, and I have it here with me.

12 I have to say that it doesn't seem  
13 to be fully responsive to our concerns. Hans,  
14 maybe you want to just summarize, because I  
15 read it last night quickly. Would you mind  
16 just summarizing why there is some residual  
17 concern?

18 MR. BEHLING: I guess the most  
19 important issue here is that the Parker report  
20 is dated 1945.

21 MR. MAURO: Yes.

22 MR. BEHLING: And it really has

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1 three sets of dosimeters that were being  
2 evaluated for three different laboratories.  
3 To some extent, they really assessed the  
4 method by which these dosimeters were  
5 irradiated against a known exposure dose and  
6 then, obviously, processed and assessed for  
7 how was the response compared to the known  
8 exposure.

9 While there were differences, they  
10 seemed feasible. I just don't know how the  
11 Parker report really addresses the issues that  
12 were raised in Section -- in finding 4.5-1  
13 which talks about the fact that there were no  
14 standard operating procedures. The individual  
15 who processed these dosimeters was a person  
16 who had no really formal training or  
17 qualification.

18 There were issues associated with  
19 the handling of dosimeters and even  
20 maintaining dosimeters. In some instances,  
21 they were left in cars which were overheating  
22 in summer months and so forth.

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1           Basically, what I was raising is  
2 the question that we don't have really quality  
3 assurance data that says this is the protocols  
4 that were used.

5           In today's world, we would have  
6 qualifications regarding the persons doing the  
7 work, the methods used to process the doses,  
8 the films, in terms of developing the film,  
9 the use of control badges which my write-up  
10 says they didn't use control badges to assure  
11 that each time when the batch, film badges,  
12 were issued and then returned that they were  
13 essentially done correctly.

14           It was just basically things that,  
15 I guess, in a 1980 assessment were identified  
16 as efficiencies, and that is where I raised  
17 it, and again in light of the Parker report, I  
18 don't see anything here that I consider  
19 relevant in addressing those issues.

20           MR. ROLFES: All right. I am  
21 searching for some information. I know we  
22 have addressed this previously, but I will

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1 have to take a minute to see what we provided  
2 in response to this.

3 MR. BEHLING: And let me -- while  
4 you are looking, Mark, let me just make a  
5 couple of comments.

6 Oftentimes the justification saying  
7 things are okay just based on the use of a  
8 specific film dosimeter, that they have used a  
9 Dupont 508 film, etcetera, but that is really  
10 not necessary. The only criterion for judging  
11 the performance of a dosimeter in many  
12 instances, if you are talking about a film  
13 dosimeter program that was handled in-house,  
14 the real critical issues that have to be  
15 addressed is what were the doses for radiation  
16 exposures in developing a dose response curve?

17 Was that properly done? Were there specific  
18 procedures in place regarding how the film was  
19 developed; that is, the chemical methods for  
20 developing the time, the solutions, the  
21 temperature of the solutions, etcetera,  
22 etcetera.

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1           Those are other critical variables  
2 that go above and beyond the type of film that  
3 was used in that timeframe.

4           MR. NETON: And I would say that we  
5 must have some information on this. This is  
6 Jim. I have not looked at this in much  
7 detail, but I know that they had calibration  
8 curves of all those films going way back, but  
9 we will have to look -- rely on Mark.

10          MR. ROLFES: Yes, I will have to  
11 take a look back.

12          MR. NETON: I agree with you, it is  
13 more than just what dosimeter was used. But I  
14 know -- I recall -- I think those data still  
15 are there. I mean the actual pieces, the  
16 calibrations, film and the stuff, were still  
17 available a long, long time ago.

18          MR. BEHLING: Yes. If you look at  
19 the finding 4.5-1 in my report, these  
20 quotations come out of an assessment fact  
21 sheet that was dated September 11, 1981. So  
22 as late as '81, obviously, they were still

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1 suffering from certain deficiencies regarding  
2 personal film dosimetry programs.

3 MR. NETON: I need to go back and  
4 refresh my memory of what was said there,  
5 because I remember these comments now. These  
6 are actually site profile comments, I think,  
7 from a long time ago.

8 MR. MAURO: They may be carried  
9 over.

10 MR. NETON: I think that is  
11 reasonable.

12 MR. MAURO: Right.

13 MR. NETON: I'm just stretching to  
14 try to remember. We spent so much time on  
15 internal that I've forgotten what we've done  
16 in the external area to address those issues.  
17 We may have to get back to you on this.

18 MR. ROLFES: The only thing I am  
19 seeing that jumps out at me immediately is the  
20 FMPC external dosimetry program quality  
21 assurance manual that was placed onto the O:  
22 drive August of 2007, and let's see, it was

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1 during the Westinghouse Materials company  
2 years, roughly 41 pages. There is some  
3 description of the luminescent dosimeters that  
4 were issued at Fernald.

5 MR. NETON: That is later.

6 MR. ROLFES: Right. Right. I do  
7 see the Herb Parker analysis that is out here.

8 MEMBER ZIEMER: The Parker analysis  
9 probably precedes any commercial film badge  
10 work. They had to be doing in-house stuff or  
11 using Oak Ridge's system or something.

12 What you would be looking for, I  
13 guess, would just be some -- I mean, there  
14 were no national intercomparisons or anything,  
15 as far as I know. So you would be looking for  
16 what standards did they use to calibrate and  
17 the variables that Hans mentioned, which can  
18 affect the darkening of the film, and then the  
19 development process.

20 As far as qualified people,  
21 probably all the lines probably were returning  
22 people as they were. Forty-five would have

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1       been just as the war ended, and in the first  
2       couple of years of that.

3               MR. NETON:     Fernald didn't start  
4       until '52.  I think the Parker report was kind  
5       of going to what Hans said, that eliminate the  
6       dosimetry stuff.

7               MEMBER ZIEMER:  Yes, yes.  Okay.

8               MR. NETON:     But the actual  
9       processing -- and you're right.  In the 1950s  
10      there were no standard operating procedures  
11      like we would consider today that are  
12      controlled and reviewed and that sort of  
13      thing.  But I recall us pulling out at one  
14      point descriptions of what was done, and we  
15      need to piece that back together again, I  
16      think.

17              MR. ROLFES:  I am looking through  
18      what I've got.  I'm not seeing anything.  We  
19      will take a look back and see what else we  
20      have received from our data captures that  
21      we've done since the SEC evaluation and make  
22      those available to the Advisory Board Working

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1 Group as well.

2 MR. MAURO: If I may move on, issue  
3 number 5-2 has to do with something we have  
4 not discussed since a year ago. We did not  
5 discuss this matter in the March 2008 meeting.

6 It has to do with doses to extremities.

7 Now basically, we have some tables  
8 here on how was that monitored. Now let me  
9 preface this. Hans pointed this out to me  
10 last night.

11 I don't know if there's too many  
12 people that are claimants that have cancer of  
13 the hands or fingers. So maybe this is not --  
14 I don't know the degree to which it would be  
15 considered an important SEC issue. But the  
16 data we do have -- and I will hand this out,  
17 not PA cleared -- is basically a summary of  
18 the number of individuals that had extremity  
19 monitoring as a function of the year.

20 As can be seen, it was not until  
21 the 1980s when there are -- that people really  
22 started to have extremity monitoring. The

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1 early years are very limited.

2 The importance of this, you know, I  
3 will leave it into the hands of the work  
4 group. The reality is that's the data as best  
5 we can capture it, and it definitely shows  
6 that the number of -- the amount of extremity  
7 monitoring was extremely limited in the early  
8 years.

9 MR. BEHLING: And then let me also  
10 add to that, in looking at this data that you  
11 probably don't have access to, but I have  
12 given it to John and he may show it to you on  
13 a personal level, because it does contain  
14 names of individuals. So we are not  
15 privileged to hand it out. But the doses in  
16 the early years, beginning in the very early  
17 years, for those people who were monitored was  
18 quite substantial.

19 We have doses, yearly doses, up to  
20 33 rads, as well as high as even 55 in one  
21 case, 63 in one case, to extremities. So the  
22 doses were very, very high, and the number of

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1 personnel who were monitored for extremity  
2 exposures in the early years was very, very  
3 marginal.

4           You can see the rise, the dramatic  
5 rise, in numbers from the handout that John  
6 gave you. So the question that was raised in  
7 my finding is that -- and I back that up by a  
8 couple of in-house memoranda that talked about  
9 the need for further monitoring among people  
10 who were currently not monitored, and that was  
11 the genesis of the finding, that according to  
12 some of the interoffice memos that were cited  
13 in my report, there were substantial extremity  
14 doses among a handful of people who were  
15 monitored, but it was also a matter of fact  
16 that there were other people who had finger  
17 exposures or likely finger exposures who were  
18 not monitored.

19           I think this table demonstrates the  
20 limited number of personnel monitored during  
21 the early years when, in fact, the exposures  
22 to extremities were substantial.

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1                   MR. NETON: I agree with you,  
2 Hans. It seems like it would be very  
3 straightforward to develop some sort of a  
4 ratio of shallow dose to extremity dose, you  
5 know, the beta dose. There's ratios that can  
6 be developed based on the monitoring data we  
7 have.

8                   MR. BEHLING: In fact, that ratio  
9 is given in my write-up. In fact, they made  
10 comments regarding that ratio of external  
11 whole body. Obviously, your chest badge will  
12 pick up also a skin dose and, of course, that  
13 can be compared to perhaps the wrist badge  
14 that was worn by those individuals.

15                   So you can, obviously, draw some  
16 correlation.

17                   MR. NETON: Yes, you can draw a  
18 correlation, and then you would only assign  
19 that dose to people that -- you know, if you  
20 had a substantial shallow dose to the chest  
21 badge, then you could apply the ratio to the  
22 extremity dose.

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1           So I think this is what John might  
2           call a tractable problem.

3           MR. BEHLING:   And I would recommend  
4           using the chest badge beta dose and use that  
5           as a way of correlating the potential exposure  
6           for extremity dose.

7           MR. NETON:     I agree with you.  
8           Well, that is assuming we can get through this  
9           QA issue that we were just talking about 10  
10          minutes ago, though.

11          MR. MAURO:    The next item I have  
12          here -- and I am going to B- again, I've got  
13          to punt to Hans. It has to do -- and I'm not  
14          sure if this is -- it has to do with  
15          unmonitored shallow and deep dose resulting  
16          from skin/clothing contamination.

17          This subject was discussed a year  
18          ago, the 10/24/07 meeting, and the work group  
19          basically asked NIOSH to examine whether -- in  
20          other words, how to deal with the fact that  
21          there might be clothing contamination, and, as  
22          a result of that contamination there is a beta

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1 dose associated with that, and that that may  
2 need to be taken into consideration. That is  
3 the fact that people are wearing contaminated  
4 clothing.

5 Then the work group, based on that  
6 concern, which is described in our report --  
7 and Hans, if you would like to describe it  
8 further, but that there may be some need to --  
9 the work group said NIOSH will examine whether  
10 an adjustment is necessary.

11 MR. BEHLING: If I can just make a  
12 comment again. If you do have those who have  
13 access to the original review of the SEC  
14 petition report that I wrote, finding 4.5-3  
15 pretty much gives you a background against  
16 which this issue was raised.

17 That is, apparently as of even 1985  
18 the Fernald facility did not really monitor  
19 people for skin contamination, clothing  
20 contamination, by having portal monitors, as  
21 you would in today's world.

22 So people may have been

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1 significantly contaminated, going home with  
2 that contamination, with the exception of some  
3 people who were, I guess, expected to shower  
4 at the end of the shift. Others were,  
5 obviously, not.

6 So the issue of skin contamination  
7 is a significant potential for large doses,  
8 given what we already talked about, that  
9 involves extremity skin exposures. But in  
10 addition to those doses, you may have had skin  
11 contamination that would have continued to  
12 expose an individual for, obviously, longer  
13 periods of time other than the dosimeters that  
14 you wear would indicate.

15 That is, if you are not one of  
16 these people who thoroughly scrubs your scalp  
17 every day by washing your hair or necessarily  
18 taking a bath every day, you may have long  
19 time skin exposures associated with  
20 contamination, skin contamination, and/or  
21 clothing contamination, clothing worn for days  
22 on end, possibly.

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1           It is just an issue that I raised  
2 here, and I'm not sure I know how to go about  
3 coming up with an answer. But you may have  
4 looked into it, and you may have some  
5 comments.

6           MR. ROLFES: Hans, this is Mark  
7 Rolfes, and I think we addressed this and a  
8 couple of the previous issues in our previous  
9 working group meetings.

10           To the best of my recollection, we  
11 came into this meeting with one action item,  
12 to provide our thorium intake model to the  
13 Advisory Board working group.

14           I would like to take a look back at  
15 the transcripts or if someone else would like  
16 to take a look back at the transcripts to see  
17 what we said back then.

18           I have been looking through the  
19 data that we have provided on the O: Drive,  
20 and there is a procedures folder, an FMPC  
21 Procedures Folder, reference ID 33975.  
22 Looking through the table of contents, there

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1 is a procedure for writing procedures for the  
2 industrial hygiene and radiation department.

3 I don't need to go through the  
4 entire list in detail, but I want to point out  
5 some of the important things that I see  
6 looking through the table of contents.

7 There is some information on the  
8 special operating procedures -- standard  
9 operating procedure for the issuance of  
10 equipment and material pass, SOP for  
11 conducting ground contamination surveys or  
12 issuance of notice of contamination source,  
13 guides for radiation monitoring, film badges,  
14 dosimeters, and pocket chambers, SOP for  
15 investigation of possible radiation exposures,  
16 SOP for the use of the radiation monitoring  
17 record, procedures for the safe use and  
18 control of radioactive sources.

19 Like I said, I don't want to go  
20 through all of these, but there's roughly 113  
21 pages of industrial hygiene and radiation  
22 department SOPs and procedures that I think

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1 will address some of the concerns that we  
2 have.

3 MR. BEHLING: When was that  
4 procedure dated?

5 MR. ROLFES: Let me get up to the  
6 top page here. There are several revisions of  
7 this document. There is Revision 1.3, 1.12,  
8 1.13, 2.5, 2.16. Let's see. It looks like  
9 there's, well, several major revisions. I'll  
10 see what the date on this one is.

11 I have a letter dated June 25, 1965  
12 for the all industrial hygiene and radiation  
13 department members: AThe attached procedure  
14 manual Number 10 is being sent to you for your  
15 use. As changes are made or additional  
16 procedures formulated, this material will be  
17 given to you for placement in your manual.  
18 Information contained in the manual is not  
19 cleared for publication. The manual is to  
20 remain the property of National Lead Company  
21 of Ohio and is to be surrendered upon  
22 termination or transfer.@

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1           So this one was from 1965. Let me  
2 see if I can find a version number on here.  
3 Many of the pieces of data that we are  
4 discussing now, I believe, will be addressed  
5 or at least suspect they are discussed in this  
6 manual, without reading the entire manual.

7           I think maybe that might be a good  
8 place for us to start with reviewing, as well  
9 as the other procedures that are within this  
10 folder, to see if the data that I thought we  
11 had addressed previously is actually addressed  
12 in this folder.

13           MR. MAURO: Okay.

14           MR. MORRIS; I found another  
15 informative item on this SRDB that you might  
16 want to take a look at. It is reference ID  
17 3173, Personnel Monitoring Film Badges. In it  
18 you will find a record of just, like, one  
19 week's worth of data. Maybe it's a month's  
20 worth, I'm not sure, and it has contact data  
21 measurements, calibration films contact data  
22 exposures for different time frames, similarly

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1 for gamma exposures, and I think the year on  
2 this is 1952. So for what that's worth.

3 MR. NETON: This is interesting.  
4 I'm looking at these finding that John just  
5 excerpted, and 4.5.1 which talks about the  
6 quality assurance says this is not an SEC  
7 issue.

8 MR. MAURO: Well, that is --

9 MR. NETON: Well, but when you say  
10 you put QA procedures for '53 to '85 on the O:  
11 Drive, and then we made a reference to the  
12 Parker report -- so I don't see where you guys  
13 actually looked at any of these other  
14 procedures.

15 MR. MAURO: No, we didn't, no. The  
16 only one we looked at is the Parker report.

17 MR. NETON: So your analysis is  
18 incomplete of the data on the O: Drive.

19 MR. MAURO: May very well be true.

20 MR. ROLFES: Another folder here or  
21 another procedure manual that I've placed onto  
22 the O: Drive -- let's see. This was submitted

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1 as part of the NOO Fernald litigation.

2 We've got the National Lead of Ohio  
3 procedure manual, industrial hygiene and  
4 radiation department, health and safety  
5 division, copy number 3. There are 712 pages  
6 of procedures. That was dated -- I think it  
7 has expanded upon the one that I just  
8 referenced, but I don't have the date right  
9 here in front of me.

10 MEMBER GRIFFON: I just put that  
11 down as a dual action, and SC&A should review  
12 the procedures that are there. NIOSH might  
13 want to relook at them and, if you have  
14 anything to add --

15 MR. NETON: Yes, I agree. It also  
16 says here NASA ran the program in the very  
17 beginning, and these procedures were based on  
18 the -- so there's a lot of work.

19 MR. MAURO: Yes, there is no doubt  
20 that in the notes there was reference to -- in  
21 a year-ago meeting, reference was made to a  
22 lot of material. We did not review all that

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1 material.

2 MR. NETON: Okay.

3 MR. MAURO: I am going to move on  
4 to the next to the last item under 4.5. That  
5 has to do with neutron doses. Now it turns  
6 out that one of the questions we raised was  
7 the neutron to photon ratio, and you folks had  
8 indicated in your procedure that you are using  
9 a ratio of .23. That is, if you know the  
10 photon, this is your neutron. Use a  
11 multiplier of .23.

12 We had looked at that by doing some  
13 calculations, and we assumed different kinds  
14 of geometries and arrays of, for example, UF<sup>4</sup>.  
15 That might be in drums or in piles, and we  
16 came up with a higher number, but we made a  
17 mistake.

18 We made certain assumptions  
19 regarding what might be there. That was so  
20 large that it would have been a criticality  
21 issue. So we made a mistake, and we redid the  
22 numbers and checked it again, and we concur

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1 that your neutron to photon ratio of .23 is  
2 claimant favorable, and as far as we are  
3 concerned, we no longer have an issue on that  
4 matter.

5 We did not discuss this at the last  
6 meeting. I'm glad that we were able to get to  
7 it at this meeting.

8 MR. BEHLING: Can I also make a  
9 comment here? In addition, I reviewed a  
10 position paper on neutron monitoring ascent,  
11 it's called. It is dated 1/17/2001, and it,  
12 by and large, looks backward in time, and it  
13 says empirically, neutron dose rates and  
14 photon dose rates and, in fact, that was  
15 approved by Hennifeld, Sue Hennifeld.

16 So I looked at that, and rather  
17 than looking at theoretical calculations that  
18 are the basis for the 0.23 neutron-photon  
19 ratio, I looked at these data.

20 It turns out that if you look at  
21 the empirical data in that particular report,  
22 the 0.23 is very claimant favorable. So

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1 again, I will only reiterate what John just  
2 said. We agree that .23 is a claimant  
3 favorable dose ratio for neutron-photons, and  
4 I think we could drop the issue.

5 MR. NETON: Good.

6 MR. ROLFES: In looking through the  
7 data on the O: Drive once again, in the  
8 procedures folder there is a procedure on the  
9 policies in place at Fernald for the  
10 requirements of showering, which would speak  
11 to the personnel contamination issue.

12 MR. MAURO: Last item? The last  
13 item that we had not had an opportunity to get  
14 to at the last meeting in March 2008 had to do  
15 with unmonitored female workers.

16 Now I guess my understanding is --  
17 this is bioassay -- apparently, the issue had  
18 to do with the fact that female workers were  
19 not bioassayed. Now as I understand it, your  
20 co-worker model basically is going to assign  
21 everyone some intake, no matter what worker  
22 they were, and you are going to use your

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1 protocol, as you had indicated.

2           So my understanding is if, in fact,  
3 that is correct, that female workers were not  
4 bioassayed during certain time periods, as I  
5 understand this issue, the resolution -- and  
6 we didn't discuss this, but I guess I'm  
7 intuiting it -- is that you are using a model  
8 now that is going to assign intake to  
9 everybody, and it would follow your procedure.

10           So now in effect, my understanding  
11 is that, if a person, including women who  
12 worked there, were not bioassayed, you would  
13 make certain assumptions regarding their  
14 intake that was compatible with their job  
15 descriptions and where they were, etcetera,  
16 and assign an intake.

17           If that is the case, I guess  
18 unless anyone else has more to say about it,  
19 it seems to be a reasonable approach, given  
20 that we resolve all these other matters.

21           MR. NETON: I would certainly agree  
22 with that. I think up to a certain point

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1 women were prohibited from working in the  
2 process area at Fernald, and that is probably  
3 a good reason why they weren't monitored.

4 MR. MAURO: Well, how this issue  
5 came up, and I think Hans can confirm it, is  
6 that we actually found that three women were,  
7 for some reason, sampled at one point in time,  
8 and not expecting to find anything, they found  
9 something.

10 So it meant that there was enough  
11 residual contamination throughout the plant  
12 that, even if a person had a job description  
13 that would seem to be they really didn't have  
14 potential for internal exposure, had internal  
15 exposure.

16 MR. NETON: Do you know what urine  
17 levels they had?

18 MR. MAURO: No, but I'm sure we can  
19 track that down.

20 MS. BALDRIDGE: It's in the SEC.

21 MR. MAURO: Okay, there you go.

22 MR. ROLFES: There is a document,

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1 that report that indicates that those women  
2 had positive urine samples essentially, and I  
3 think we had a discussion about the process --  
4 excuse me, the bottles for urine sample  
5 collection could have been stored in a process  
6 area. There could have been contamination in  
7 the bottles.

8 I think we resolved this at the  
9 last meeting that we discussed this in saying  
10 that we would take a look at that data and use  
11 the data as if it were valid results. I don't  
12 recall any other further discussion of it.

13 MR. NETON: But I agree with John's  
14 original statement that we would evaluate each  
15 case, female or male, based on the merits of  
16 their job description and assign them what we  
17 would believe the appropriate co-worker model,  
18 appropriate value from that worker model.

19 MR. ROLFES: Right.

20 MR. MAURO: Of course, that -- I  
21 mean, we are going to be looking the co-worker  
22 model. Okay.

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1                   MR. NETON:   Nonetheless, you would  
2                   use the co-worker model for females, as  
3                   appropriate.

4                   MR. BEHLING:       This is Hans.  
5                   Regarding those individuals that John made  
6                   reference to, they were identified in Finding  
7                   4.1-3, and they were, I think -- three or four  
8                   of them were female.

9                   Was it your understanding that the  
10                  high levels that were observed among those  
11                  individuals were really due to cross-  
12                  contamination as an explanation for the  
13                  unexpected finding?

14                  MR. ROLFES:   That certainly is one  
15                  possibility.

16                  MR. NETON:    It wouldn't be the  
17                  first time that happened. The reason I asked  
18                  is it was a major issue with the EPA visitors  
19                  at one point that showed up positive samples  
20                  based on an analysis, and it turned out to be  
21                  false positive as well.

22                  MR. BEHLING:   I am looking at the

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1 actual - You can see or read for yourself in  
2 Attachment 4.1-3. It is our report, page 29,  
3 is the actual reproduction of the document in  
4 which the individuals were cited, and it  
5 states: The following urinary uranium results  
6 were investigated, first because there were no  
7 apparent reasons for the high uranium results,  
8 and the investigation failed to show why these  
9 urine samples were high in uranium, meaning  
10 that, obviously, you must have looked at it  
11 and perhaps speculated the potential for  
12 contamination, but obviously, that was not  
13 cited as the reason.

14 MR. MORRIS: Well, that was a  
15 discussion in one of the interviews that's  
16 available for you of the interview of the  
17 health and safety manager, and I recall him  
18 talking about that one in specific. So I'll  
19 just refer you to that.

20 MR. BEHLING: Okay.

21 MR. NETON: There's a number of  
22 reasons for high uranium values. We had

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1 people show up with high values that were  
2 actually drinking this mineral water that came  
3 from a source that just had naturally high  
4 contents of uranium, and there's a number of  
5 reasons. Doesn't mean it's not real, but I'm  
6 just saying there are plausible explanations  
7 for high uranium values other than an exposure  
8 in the plant.

9 MR. BEHLING: I don't doubt that,  
10 Jim, but the fact that they were three of the  
11 four were women is a little bit more difficult  
12 to assume that this was due to cross-  
13 contamination or something like that.

14 MR. ROLFES: I think the concern is  
15 that you've said that doses to female workers  
16 were not monitored during two operating  
17 periods, but it seems to indicate that these  
18 three women's results were, in fact,  
19 documented; and I do recall looking at the  
20 HIS-20 database to see if those high results  
21 were incorporated into the HIS-20 database,  
22 and they were, in fact, included in HIS-20.

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1                   MR. BEHLING;    Well, it may very  
2 well, Mark, be due to the fact that their  
3 analysis was linked to a yearly annual, which  
4 really was something that doesn't necessarily  
5 tie in a radiation worker, but perhaps the  
6 unexpected results were part of -- I'm not  
7 sure, but it could have been part of an annual  
8 physical where anyone was potentially subject  
9 to this evaluation without regard to their  
10 potential for exposure.

11                   MR. NETON:    That could be true, and  
12 then that just, I think, speaks to the quality  
13 of the program in a way.    I mean, they are  
14 monitoring people that had almost no  
15 potential, and they do find positives  
16 periodically.  They follow them up.

17                   MR. MORRIS:    Help me, if I'm wrong  
18 here, but wasn't this whole monitoring  
19 question of females addressed at external when  
20 you made the original comment?

21                   MR. BEHLING:    To a certain extent,  
22 because we were talking about the laundry

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1 personnel.

2 CHAIR CLAWSON: They were -- I  
3 thought that, if I remember right, the person  
4 became contaminated, but the problem was they  
5 came up with an internal dose for uranium.  
6 They submitted their sample and came up  
7 positive.

8 MR. MORRIS: But we do know for a  
9 fact that women were not monitored for  
10 external dose for some period of time. In  
11 fact, they were excluded from operating areas  
12 for several years. So that is a fact of  
13 history, not --

14 MEMBER ZIEMER: For some reason,  
15 these women were sampled. So there must have  
16 been a reason for sampling.

17 MR. MORRIS: Well, we do know that  
18 there were times when, although that was the  
19 rule, that they always made exceptions as  
20 necessary, like if somebody needed to come see  
21 something, they would bring them in. But I  
22 don't think that the workers that routinely

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1 reported for work in a foundry or a process  
2 area were women at some time during the  
3 history of the plant.

4 MEMBER PRESLEY: One of the things  
5 that backs that up: At Y-12 we had men  
6 working in the laundry, but there were two  
7 women that worked in the laundry. They  
8 repaired the clothes after they were washed.  
9 They were both seamstresses, and there were  
10 two that worked down there.

11 MR. ROLFES: For some reason, I  
12 think as Bob had alluded to, I think this  
13 started off as an external dosimetry issue.

14 MR. MAURO: It did. It did.

15 MR. ROLFES: And we had said, you  
16 know, these are the three different ways. The  
17 current approach that we would use to  
18 reconstruct an unmonitored female worker would  
19 be to assign 500 millirems per year, which  
20 would be bounding even for some of the  
21 monitored process workers.

22 There were other alternatives for

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1 external dose. I thought that this was a  
2 concern about whether unusual results like this  
3 would have been included in HIS-20. For some  
4 reason, that is what rang a bell in my mind.

5 I'd have to look. I don't have a  
6 copy of my old matrix, unfortunately. I only  
7 have this updated one that you put together.

8 MR. MAURO: No. What you are  
9 looking at right now is from the old matrix.  
10 In other words, there is no new material that  
11 I added to this, because we did not discuss  
12 this issue at the last meeting. So all you  
13 are really looking at is the old matrix.

14 MR. ROLFES: Okay. So it is  
15 everything --

16 MR. MAURO: This is roughly the old  
17 matrix, and we didn't visit this the last time  
18 out.

19 MR. ROLFES: I think there were  
20 more details about how we would assign an  
21 unmonitored dose. That's why it didn't ring a  
22 bell with me.

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1                   MR. MAURO:     As I mentioned, I  
2     grabbed two, what I believe to be, the most  
3     recent matrices we had available as my  
4     starting point.

5                   MR. ROLFES:    Let me take a look to  
6     see I have a copy of Earl's matrix. I'm not  
7     seeing it.

8                   MEMBER GRIFFON:     Draft     NIOSH  
9     response, the second -- the big paragraph  
10    there, draft NIOSH response.

11                  MR. ROLFES:     Okay.    Yes.    So we  
12    did. I'm sorry. It's getting late. I just  
13    assumed I missed it when we took the notes.

14                  MR. MAURO:     It's here.

15                  MEMBER GRIFFON:    I don't think we  
16    have anything more to do with that, other than  
17    the co-worker model should cover it.

18                  MR. ROLFES:     Right. I think we had  
19    committed that, if we had an unusually high  
20    result that, if we didn't have an  
21    investigation report which explained it, we  
22    would assume that it was a real result and use

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1 that in dose reconstruction. That would be  
2 the claimant favorable thing to do.

3 MEMBER GRIFFON: I think the other  
4 issue that sort of came up in our discussion  
5 was this question of why -- these people with  
6 significant exposure: Why weren't they in a  
7 routine program or something like that? But I  
8 think we are covering that with our first item  
9 that we discussed all morning, the co-worker  
10 model. Did they get the highest exposed  
11 people?

12 If that's fine, then this is fine.

13 CHAIR CLAWSON: Okay.

14 MEMBER GRIFFON: John asked me to  
15 look at this last -- there's these last items,  
16 and I don't want to just forget about them,  
17 but I think several of them have been  
18 addressed with NIOSH responses. So just to go  
19 through them.

20 I know that, number one, you've  
21 posted transcripts, I believe, on the O:  
22 Drive. Correct, Mark? Pretty sure I've seen

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1 those.

2 MR. ROLFES: Right.

3 MEMBER GRIFFON: And then there's  
4 also a couple of references noted there.

5 The Tiger Team reports: Now they  
6 have been posted, right? I believe there a  
7 reference they have been posted.

8 MR. ROLFES: That's correct.

9 MEMBER GRIFFON: I'm not sure that  
10 SC&A has looked at these. Just to be  
11 complete, I think we've asked you look at  
12 those. You should look at those with an eye  
13 toward does it have any impact on the dose  
14 reconstruction aspects.

15 There was a previous item that said  
16 SC&A will review the posted reports.

17 Item 3 is -- Mark, can you help me  
18 with this one, these other groups that did --

19 MR. ROLFES: Yes. It says NIOSH  
20 will follow up on whether other groups or  
21 agencies did any off-site monitoring at  
22 Fernald.

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1 I think our response was that the  
2 following agencies are known to have  
3 participated in environmental monitoring  
4 programs at Fernald. We put the Ohio  
5 Environmental Protection Agency, the Centers  
6 for Disease Control, Agency for Toxic  
7 Substances and Disease Registry, and the Ohio  
8 Department of Health.

9 MEMBER GRIFFON: I'm not sure  
10 exactly when this question arose, but I guess,  
11 in addition -- yes, what relevance. That is  
12 my question is what relevance? Are there  
13 reports that would be pertinent, that they  
14 published that would be pertinent?

15 MR. MORRIS: Now I just recall that  
16 Brad asked -- Ian talked to us about that and  
17 tell us who may have had other sources of  
18 data, and that was just what we came up with.

19 CHAIR CLAWSON: With off-site  
20 monitoring. Do you know what this French &  
21 Bell report might come into, or Phillips  
22 report may have come into it.

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1                   MEMBER GRIFFON:    Right.    So that  
2                   might be the one pertinent lead worth  
3                   following up on.

4                   CHAIR CLAWSON:    Because in reading  
5                   through a lot of that, there were some other  
6                   off-site monitoring and so forth like that,  
7                   and we were just -- what was coming from the  
8                   plant?

9                   MEMBER GRIFFON:    It seems to me,  
10                  the only follow-up on that one would be that  
11                  second drive.

12                  CHAIR CLAWSON:    And I think that  
13                  you've put -- that Mark has put some  
14                  environmental ones on there.    I know that I  
15                  read some environmental reports and so forth  
16                  like that that they had put in to it.

17                  MR.    ROLFES:            There is an  
18                  environment safety and health progress  
19                  assessment of Fernald, and I think that was --  
20                  let's see, and then also the environment --  
21                  there were other environmental surveys that  
22                  were conducted by Fernald personnel as well.

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1 Off-site monitoring was also done.

2 MEMBER GRIFFON: You know what I  
3 want to do with this, just so we don't miss  
4 anything. I think we should ask SC&A to  
5 review what you have posted on other agency  
6 reports for relevance, and report back to us,  
7 and don't go any further.

8 If they are completely  
9 environmental and you don't feel they are  
10 relevant to occupational dose reconstruction,  
11 then you can tell us that. Just review for  
12 relevance, I guess, is what I would say.

13 MR. MAURO: Got it.

14 MEMBER GRIFFON: And then the  
15 fourth one is committee formed to reconstruct  
16 thorium operational history. I do remember  
17 discussing this. Basically, I think you've  
18 concluded that you have a reasonable thorium  
19 operational history and, from the raw data  
20 that you have looked at and, I think, covered,  
21 and there is no need to go any further into  
22 this other report. Right?

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1 MR. MORRIS: I think you are right.  
2 We've done a pretty nice historical timeline  
3 on thorium, got it presented pretty well, and  
4 I think it actually correlates pretty well  
5 with the research we have done in the last few  
6 months at Savannah River for the evaluation  
7 report there; because the thorium from Fernald  
8 actually was a feed stock to Savannah River.

9 So we have actually gotten -- been  
10 able to line those two up, and they make sense  
11 together.

12 MEMBER GRIFFON: I don't think  
13 there is any further action there, unless --  
14 and we will see this thorium operational  
15 timeline sort of laid out when we look at the  
16 --

17 MR. MORRIS: It's on the O: Drive  
18 now.

19 MEMBER GRIFFON: It's on the O:  
20 Drive, but also when we are going to look at  
21 closer, I guess, is with the valuated averages  
22 and how they work together. Right?

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1 MR. MORRIS: Sure, yes. And it  
2 will be in the revision when we redo Chapter 2  
3 of the site profile.

4 MEMBER GRIFFON: Then unless  
5 anybody stops me, Item 5, follow-up on doses  
6 assigned in the beginning years of '83 to '85.

7 CHAIR CLAWSON: This has to do with  
8 the skin dose correction.

9 MEMBER GRIFFON: Yes. And the last  
10 thing I see is interviews are continuing to  
11 discover if additional corrections were  
12 applied. So I don't know where this stands,  
13 really.

14 MEMBER ZIEMER: Is that a NIOSH  
15 comment in red?

16 MEMBER GRIFFON: I am not sure.

17 MR. NETON: I think that's a NIOSH  
18 comment.

19 MR. MAURO: That would have been  
20 something that had been added after the  
21 October 2007 meeting as additional information  
22 that was -- that's usually how that works.

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1                   MEMBER ZIEMER: Well, you put it in  
2 right here, John.

3                   MR. MAURO: No, no. It was in red.

4                   MEMBER ZIEMER: So it was in red.  
5 Okay, I see.

6                   MEMBER GRIFFON: I don't know if I  
7 put it or, Mark, if you put it in, because we  
8 have been sending these back and forth.

9                   MR. ROLFES: To the best of my  
10 recollection, it was our statement that --  
11 well, you know, I don't know.

12                   MR. NETON: There was one issue  
13 when they initiated the -- they switched to  
14 the thermal luminescent dosimeter, that there  
15 was an incorrect algorithm. They fit like a  
16 fourth order polynomial to a few data points,  
17 and, unbeknownst -- before computers were  
18 really readily available, it put an extra loop  
19 in there that really wasn't justified, based  
20 on degrees of freedom of the data, and they  
21 went back and re-analyzed the calibration  
22 curve, and redid the data. Walt just actually

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1 redid that analysis.

2 MEMBER GRIFFON: That last  
3 statement is what is making it an open action  
4 item.

5 MR. NETON; Yes. I don't know why.

6 CHAIR CLAWSON: But I think you are  
7 right or I'm remembering right, because I  
8 think it that additional interviews came from  
9 people questioning when they did that, when  
10 they changed that.

11 MR. NETON: Right.

12 CHAIR CLAWSON: There were some  
13 issues there with it.

14 MR. NETON; I think it was fairly  
15 well documented through internal memos what  
16 transpired there. At least that's my  
17 recollection.

18 MEMBER GRIFFON: Okay.

19 MR. KATZ: Okay.

20 MR. ROLFES: The interviews that we  
21 have alluded to, I believe, were conducted in  
22 August 2007, plus we've got a couple of

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1 interviews from November of 2007. So this was  
2 likely alluding to a couple of interviews that  
3 we put onto the O: Drive back in 2007.

4 MEMBER ZIEMER: We need to close  
5 that out then. Make sure that it=s -- well,  
6 they need to make sure.

7 MEMBER GRIFFON: All right. That's  
8 it.

9 CHAIR CLAWSON: That sounds good to  
10 me.

11 MR. KATZ: Folks on the phone, if  
12 there are any still left, we are adjourning.  
13 Thank you for participating.

14 (Whereupon, the above-entitled  
15 matter concluded at 5:01 p.m.)  
16  
17  
18  
19  
20  
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