

UNITED STATES OF AMERICA  
DEPARTMENT OF HEALTH AND HUMAN SERVICES  
CENTERS FOR DISEASE CONTROL AND PREVENTION

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NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY  
AND HEALTH  
NTS (NEVADA TEST SITE) WORKGROUP

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WEDNESDAY, APRIL 23, 2009

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The workgroup convened in the  
Zurich Room of the Cincinnati Airport  
Marriott, Hebron, Kentucky at 9:30 a.m.,  
Robert Presley, Chairman, presiding.

PRESENT:

ROBERT PRESLEY, Chairman  
GEN ROESSLER, Member  
BRAD CLAWSON, Member  
WANDA MUNN, Member  
PHILLIP SCHOFIELD, Member  
MARK GRIFFON, ex officio

THEODORE M. KATZ, Acting Designated Federal  
Official

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## IDENTIFIED PARTICIPANTS:

JIM NETON, NIOSH ORAU  
MARK ROLFES, NIOSH ORAU  
ROBERT MORRIS, NIOSH ORAU  
JENNIFER HOFF, NIOSH ORAU  
MONICA HARRISON-MAPLES, NIOSH ORAU  
GENE ROLLINS, NIOSH ORAU  
BRYCE RICH, NIOSH ORAU  
KARIN JESSEN, NIOSH ORAU  
BILLY SMITH, NIOSH ORAU  
NANCY ADAMS, Contractor to NIOSH  
JOHN MAURO, SC&A  
LYNN ANSPAUGH, SC&A  
ARJUN MAKHIJANI, SC&A  
BOB BARTON, SC&A  
EMILY HOWELL, HHS  
JASON BROEHM, CDC  
JOHN FUNK, Petitioner

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

9:29 a.m.

MR. KATZ: Good morning,  
everybody. Good morning, everybody on the  
line as well. This is Advisory Board on  
Radiation Worker Health as the NTS Working  
Group and we're getting going here. We're  
going to begin as usual with the roll call,  
starting with board members in the room with  
the Chair. And in roll call please note your  
conflict of interest situation as well. Thank  
you.

CHAIRMAN PRESLEY: This is the NTS  
Working Group. Today is Thursday the 23rd.  
I'm Robert Presley, Chairman for the NTS  
Working Group.

MEMBER ROESSLER: Gen Roessler,  
member of the NTS Working Group. No conflict.

MEMBER SCHOFIELD: Phillip  
Schofield, Board Member. Working Group NTS.  
No conflict.

MEMBER MUNN: Wanda Munn, member

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1 of the Working Group. No conflict.

2 MEMBER CLAWSON: Brad Clawson,  
3 member of the Working Group. No conflict.

4 MEMBER GRIFFON: And Mark Griffon.  
5 I'm not a member of the work group. I'm on  
6 the NIM, conflicted for -- with Bob Presley.

7 CHAIRMAN PRESLEY: Let me say that  
8 I'm not conflicted.

9 MR. KATZ: Thank you, Bob. And on  
10 the line, I just need to check. I assume we  
11 don't have any board members, but if there is  
12 a board member, please let us know.

13 Okay. That's good, because  
14 otherwise we'd be pressing a quorum here.

15 And now in the room, the NIOSH  
16 ORAU Team.

17 DR. NETON: Oh, I'm sorry. Jim  
18 Neton, NIOSH. Not conflicted at NTS.

19 MR. ROLFES: Mark Rolfes, NIOSH  
20 health physicist. No conflict of interest.

21 MR. MORRIS: Robert Morris, Oak  
22 Ridge Team, not conflicted.

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1 MS. HOFF: Jennifer Hoff, ORAU  
2 Team, not conflicted.

3 MS. HARRISON-MAPLES: Monica  
4 Harrison-Maples, ORAU Team, not conflicted.

5 MR. KATZ: And on the line, do we  
6 have any NIOSH ORAU Team?

7 MR. ROLLINS: Gene Rollins, ORAU  
8 Team, not conflicted.

9 MR. RICH: Bryce Rich, ORAU Team.  
10 I have a --

11 MR. KATZ: I'm sorry, Bryce. We  
12 couldn't hear that. Do you have a conflict?

13 MR. RICH: I have a conflict.

14 MR. KATZ: Okay. Thank you.

15 MS. JESSEN: Karin Jessen, ORAU  
16 Team, not conflicted.

17 MR. KATZ: Okay. Is that Karin  
18 Johnson?

19 MS. JESSEN: Jessen.

20 MR. KATZ: Jessen? Thank you.

21 MR. SMITH: Billy Smith, ORAU  
22 Team, conflicted.

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1 MR. KATZ: Thank you, Billy.

2 Okay. And in the room, SC&A,  
3 please?

4 DR. MAURO: John Mauro, SC&A, not  
5 conflicted.

6 DR. ANSPAUGH: Lynn Anspaugh,  
7 SC&A, conflicted.

8 MR. MAKHIJANI: Arjun Makhijani,  
9 SC&A, no conflict.

10 MR. KATZ: And on the line, SC&A,  
11 please?

12 MR. BARTON: Bob Barton, SC&A, no  
13 conflict.

14 MR. KATZ: Okay. And then --

15 CHAIRMAN PRESLEY: I think Emily's  
16 in --

17 MR. KATZ: Right. Right. Now --

18 MS. HOWELL: Emily Howell, HHS.

19 MR. KATZ: Are there other federal  
20 employees, HHS or otherwise? Emily Howell.

21 MS. ADAMS: Nancy Adams, NIOSH  
22 contractor.

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1 Ted, I'm having difficulty  
2 hearing.

3 MR. KATZ: Well, Emily was in the  
4 doorway when she spoke.

5 MS. ADAMS: No, but even other  
6 folks on the line as you were going around the  
7 room.

8 MR. KATZ: This is Nancy Adams.  
9 So you're having a hard time  
10 hearing me?

11 MS. ADAMS: Yes, you're really  
12 faint. I don't know if other folks on the  
13 line --

14 MR. KATZ: Well, I'm right in  
15 front of the mic.

16 MR. BROEHM: This is Jason Broehm,  
17 CDC Washington office. I'm hearing you guys  
18 loudly and clearly.

19 MS. ADAMS: Okay.

20 MR. KATZ: It's your phone, Nancy.

21 MS. ADAMS: I'll hang up and dial  
22 back in and see if I get a better --

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1 MR. KATZ: I'm sorry. I'm  
2 teasing.

3 Okay. And then on the line, so we  
4 have Jason Broehm. Any other federal  
5 employees, HHS or otherwise?

6 Okay. And then now we go -- we  
7 don't have in the room anyone from the public  
8 or petitioners, but on the line do we have  
9 petitioners or anyone else from public who  
10 wants to identify themselves?

11 Okay. And on the line do we have  
12 any staff from Congressional offices who want  
13 to identify themselves?

14 Very good. Then let me just  
15 remind everyone on the line to please mute  
16 your phone except when you're addressing the  
17 Working Group. And if you don't have a mute  
18 button, use star-6. Please disconnect. Don't  
19 use your hold button at any time during the  
20 call.

21 And, Bob, it's all yours.

22 CHAIRMAN PRESLEY: Okay. The

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1 agenda is going to be real simple today. We  
2 are going to start off with Mark Rolfes, CDC,  
3 going over our three items that we had that  
4 were outstanding at the last meeting. And  
5 after we complete that, then we want John to  
6 talk about his white paper.

7 I think we can still talk about  
8 that, is that correct, Emily?

9 MR. KATZ: Yes. Yes.

10 CHAIRMAN PRESLEY: The coworker  
11 model, we can talk about it?

12 MR. KATZ: Absolutely.

13 CHAIRMAN PRESLEY: Okay. I want  
14 to go through that. And then that'll be a  
15 pretty full day for us.

16 MR. KATZ: Let me just note for  
17 people on the phone, we have an SC&A paper,  
18 the coworker model that's currently proposed  
19 by NIOSH OCAS. And that is in the process of  
20 being Privacy Act-cleared, but I don't believe  
21 it's been cleared yet. Is that correct?

22 MS. HOWELL: My part is done.

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1                   MR. KATZ: Okay. But anyway, it  
2 hasn't been cleared and released. So I just  
3 want to let anyone from the public on the line  
4 know that that document's not available yet.  
5 When we have our discussions today, just  
6 everybody please be careful to stay away from  
7 any Privacy Act information when you discuss  
8 the document. Thanks.

9                   CHAIRMAN PRESLEY: Okay. Mark?

10                  MR. ROLFES: Okay. Thank you,  
11 Bob.

12                  Just to make it short, there were  
13 three primary issues that we were looking into  
14 and we were asked by the Advisory Board  
15 Working Group Committee to do additional  
16 research into.

17                  The first one was the removal of  
18 dosimetry badges by NCS workers. And we had  
19 done our own analysis at NIOSH to determine  
20 whether there were individuals that could have  
21 removed their dosimeters to avoid, for  
22 example, exceeding a radiation dose limit. We

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1 looked at several cases, pulled access logs,  
2 dosimetry records and worker files to  
3 determine whether this process or practice did  
4 in fact occur. Everything that we were able  
5 to find indicated that this practice was not  
6 widely spread, if it did in fact occur. And  
7 we do have a method for those limited number  
8 of cases to assign missed doses or un-  
9 monitored doses during this un-monitored  
10 period.

11 Further, SC&A also selected  
12 several workers who indicated that they had  
13 removed their dosimeters. And of those  
14 individuals, they did the exact same thing as  
15 NIOSH, I believe, pulled records, looked  
16 through dosimetry files and interview records.

17 MR. MAKHIJANI: I don't know that  
18 that's --

19 MR. ROLFES: They had determined  
20 that nine of ten --

21 MR. MAKHIJANI: I don't know that  
22 that's accurate.

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1 MR. ROLFES: Okay. Well, let me  
2 give my update please first and then I'll let  
3 you give your side.

4 So, nine of ten workers that were  
5 reviewed clearly showed that the practice  
6 probably did not occur while the other  
7 individual, the one out of ten individual,  
8 they found that it was inconclusive.

9 The second thing on the table that  
10 was in discussion was the re-suspension intake  
11 model for NTS. And there is some debate over  
12 how we are assigning ambient internal  
13 exposures to un-monitored workers in forward  
14 areas. And we had initially started off with  
15 an approved site profile and approved method  
16 in our ambient technical basis document. And  
17 SC&A had some comments on how those intakes  
18 were being calculated.

19 So we agreed to do some additional  
20 research, came up with a higher method, a  
21 method that resulted in higher internal doses  
22 due to higher intakes. However, both SC&A and

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1 NIOSH felt that the method was too  
2 conservative. So we were asked to once again  
3 revise the method that was used to calculate  
4 intakes. So we pulled additional air  
5 monitoring records and used largely the air  
6 monitoring records to strengthen our basis for  
7 assigning ambient intakes.

8           There's also currently an approved  
9 method in the Nevada Test Site technical basis  
10 document to assign ambient intakes to un-  
11 monitored workers.

12           This third and probably the  
13 biggest of the three was the bioassay data  
14 that we are using to develop a coworker study  
15 to assign intakes to workers who were working  
16 in controlled areas and may not have been  
17 appropriately monitored.

18           We had proposed a method to bound  
19 internal doses to workers and the method that  
20 we used was by selecting the highest 100  
21 externally exposed individuals. We felt that  
22 they would have higher potentials for internal

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1 exposures. So all 100 of those high  
2 externally-exposed individuals that we pulled  
3 out of our record system, their bioassay data  
4 was evaluated to determine whether the  
5 information contained in their files would be  
6 sufficient for us to complete bounding dose  
7 reconstructions. We felt that it was,  
8 however, we also feel that if we are able to  
9 obtain additional bioassay data from DOE  
10 Nevada that that will strengthen our coworker  
11 model. And at this time we have not been able  
12 to obtain those additional bioassay data due  
13 to funding. So we have had some conference  
14 calls with DOE and we're hopefully going to be  
15 able to get some funding out to Nevada so that  
16 we can obtain some additional data.

17 So anyway, those are the three  
18 things that I believe have been in discussion  
19 and I guess we can open up the specific items  
20 for discussion and work from there. Thank  
21 you.

22 MR. MAKHIJANI: May I just make a

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1 correction?

2 CHAIRMAN PRESLEY: Yes.

3 MR. MAKHIJANI: The ten cases that  
4 SC&A pulled, that report was given to you last  
5 year. They were not of the workers that SC&A  
6 interviewed. There are two separate tracks of  
7 the interview of the badging issue, as you  
8 know.

9 The ten cases were pulled from  
10 among the claimant files and then we compared  
11 the badge readings with the PICs and so on.  
12 And that's the report we're referring to, so  
13 those were not of the workers that were  
14 interviewed. That was for the 6367 period.  
15 The workers that were interviewed were  
16 primarily later workers who had stood up  
17 during a board meeting in Las Vegas and said  
18 they'd taken off their badges because they  
19 were afraid they would be damaged. It was not  
20 an issue of them being afraid they would  
21 exceed the dose limits. And those interviews  
22 were conducted in Las Vegas last year. And

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1 that interview record has been submitted to  
2 you and the Working Group has elected, so far  
3 at least, not to follow up on the actual dose  
4 records and make any comparison with that. So  
5 it's actually very important to have the  
6 record accurate about that. Thank you.

7 DR. MAURO: I'd like to add one  
8 more item in the second area, the area dealing  
9 with environmental, just a minor point of  
10 clarification.

11 There was in fact a process  
12 maturity in terms of -- or on strategy for  
13 dealing with environmental exposures on flats  
14 to workers. And there was one approach that  
15 was under consideration; we call it the dust-  
16 loading approach, where NIOSH was going to  
17 assume that knowing the activity in soil  
18 throughout the site, and there's lots of data  
19 on that. The assumption is going to be made  
20 dust-loading that would be in the air where  
21 workers might be working would be five  
22 milligrams per cubic meter. It contained the

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1 same activity with milligrams as is the soil  
2 under their feet.

3 Our reaction to that was extremely  
4 favorable. That is, that would be a very  
5 conservative bounding approach to presuming  
6 that someone's exposed continually. Certain  
7 people could be exposed to five milligrams per  
8 cubic period for short periods of time, it's  
9 very common, and continually. So quite  
10 frankly, we were at a point in that process  
11 where we were certainly prepared to support that.  
12 But we also agree that that was a very  
13 conservative approach and we would represent  
14 a truly bounding strategy for dealing with  
15 that problem. But that problem was set aside,  
16 that approach was set aside for the approach  
17 that is now on the table based on air sampling  
18 data, collected I believe after 1970. And in  
19 our last meeting, we gave a report. In fact,  
20 Lynn Anspaugh took the lead on presenting our  
21 position and we have very, very serious  
22 problems with that strategy.

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1                   So as of this day we are at an  
2                   impasse on that strategy. I don't know it can  
3                   resolve in any way.

4                   DR. NETON: Well, that's is what  
5                   we talked at this --

6                   DR. MAURO: Right. I just wanted  
7                   to make sure we understood the process and  
8                   where we are.

9                   DR. NETON: Yes. This is  
10                  something that we've been thinking about most  
11                  recently. And there's market data and you  
12                  just -- we've gone through this sort of  
13                  evolutionary process of different models  
14                  trying to bound what we consider ambient  
15                  environmental. I think the disconnect arose  
16                  at the last meeting, and I think I brought it  
17                  up, that there's sort of a difference in my  
18                  mind between ambient environmental, people who  
19                  are sort of not necessarily doing active work,  
20                  disturbing soil and that sort of thing, versus  
21                  those who would be engaged in on-site sort of  
22                  activities. And to that end, it would seem to

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1 me that maybe a hybrid approach of these two  
2 models, one would be this ambient  
3 environmental model where we would apply that,  
4 as I suggested to those who were cafeteria  
5 workers, you know, sort of administrative  
6 workers not actively engaged in heavy labor,  
7 disturbing soils at least. And then possibly  
8 use this dust-loading model for workers who  
9 are working on various jobs about the site.

10 DR. MAURO: Oh, and that aspect of  
11 it, when we last closed, and you're refreshing  
12 my memory, we were discussing alternatives, an  
13 alternative strategy where you wouldn't be  
14 applying the air sampling data to everyone.  
15 You would parse that. But and I'm just  
16 saying, but I thought the way we left it was  
17 you were considering using the Table 7-1  
18 approach.

19 DR. NETON: Approach to everyone,  
20 yes. I think there's a middle ground here,  
21 that's what I'm suggesting, is that rather  
22 than apply these coworker dosimetry models

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1 that we're going to talk about later, which  
2 are for people who are I think engaged in --  
3 people who are monitored have a much higher  
4 potential for exposure.

5 MR. ROLFES: People that performed  
6 re-entries --

7 DR. NETON: Re-entries and sort of  
8 thing. But to apply that seemed to me to be  
9 a little over the top. But to take the dust-  
10 loading models, you're outside and you're  
11 working, you're actively disturbing soil, to  
12 apply this previous model, it was really  
13 originally going to be just a pure  
14 environmental model, and now make it an  
15 outdoor-specific air model for workers.

16 DR. MAURO: So in effect, I mean  
17 you're going to that segment of the Flats,  
18 open area workers. You'd be returning to the  
19 five milligram per cubic meter strategy?

20 DR. NETON: It's a suggestion.  
21 I'm not saying we're going to do that, but I  
22 think it's open for suggestion.

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1 DR. MAURO: My reaction to that is  
2 very favorable.

3 MR. FUNK: Excuse me. Could I  
4 make a comment here?

5 MR. KATZ: Welcome, John. Yes,  
6 absolutely. Go ahead.

7 MR. FUNK: Yes, I was assuming  
8 that we were on a level playing field here,  
9 that we would all have access to information.  
10 It appears that the working board has  
11 information that I don't have. Now I've  
12 talked to John Mauro and he told me that  
13 information would be forthcoming. I have not  
14 received it. So you people are working with  
15 information I haven't even had an opportunity  
16 to look at. I don't --

17 MR. KATZ: John. John, there is.  
18 As I think you maybe joined the call after the  
19 outset of the meeting, but I explained up  
20 front at the meeting there's only one document  
21 and it's not being discussed right now. We're  
22 really discussing documents that are from long

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1 ago, I think, at this point, that you do have,  
2 like Dr. Anspaugh's review of the air sampling  
3 monitoring.

4 But there is one document that you  
5 don't have. SC&A has been working hard along  
6 with its NIOSH counterparts to PA-clear it.  
7 It's on the coworker model, but it hasn't been  
8 completely cleared yet. And again, we always  
9 strive to get these ready and available,  
10 particularly to petitioners and members of the  
11 public with an interest in advance of these  
12 Working Group meetings, but it's not always  
13 feasible to do that. And so you will receive  
14 that document as soon as it's through the PA  
15 clearance process, but as of this moment it  
16 still isn't completely finished, even though  
17 I think a lot of the work has been done. So  
18 I apologize for that, but that's the reality  
19 that lives with us with all of these Working  
20 Group meetings because we can't always  
21 complete these documents far enough in advance  
22 to get that work done.

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1                   Okay. You can continue the  
2 discussion.

3                   DR. MAURO: No, it's good to get  
4 that behind us, because I think now we all  
5 agree on the state of the first two issues.  
6 And that would be the badge-left-behind issue  
7 and the ambient exposure issue. And now we  
8 can focus in on what I consider to be the only  
9 issue that's truly left that needs to be  
10 engaged, and it's a very important issue.  
11 It's almost the underpinning of the  
12 reconstruction of the internal doses as -- and  
13 a great of work was done.

14                   Just by way of introduction before  
15 I turn it over to Arjun, we in effect put out  
16 a report last October on the subject of Table  
17 7-1 of the evaluation report. I presume  
18 everyone around the table knows what I'm  
19 referring to when I say Table 7-1, which is  
20 the 100 workers that were selected by NIOSH to  
21 be the bioassay data which would be used as a  
22 basis to build an internal dosimetry coworker

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1 model for workers at the Nevada Test Site  
2 post-1962. We issued a review of that report  
3 back in October, however, subsequent to that  
4 we got additional information that we felt was  
5 important and we issued a supplement to that  
6 report.

7           And that supplement, by the way,  
8 John, if you can hear me, is the report that  
9 was just referenced. That supplement, let me  
10 read it: It's called, "Addendum to the  
11 October 2008 SC&A Report: Evaluation of  
12 Internal Dosimetry Data Selected by NIOSH for  
13 the Use and the Development of a Coworker  
14 Model for Workers at the Nevada Test Site  
15 Post-1962." It is dated March 2009 on the  
16 cover page. And on the footers it's dated  
17 March 19, 2009. I believe this is going to be  
18 the primary subject of today's meeting.

19           CHAIRMAN PRESLEY: Correct.

20           DR. MAURO: And with that, I'd  
21 like to turn it over to the principal  
22 researchers and authors of that work, which is

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1 Arjun and Lynn. But we did have a great deal  
2 of support from Bob Barton and Nicole Briggs.  
3 And I also was very much involved. So it was  
4 a large team that worked on this particular  
5 report. And it goes to the heart of adequacy.  
6 I'll call them the NIOSH 100 and Table 7-1.

7 But, Arjun, it's all yours.

8 CHAIRMAN PRESLEY: Before we go --

9 MR. FUNK: John, I'd like to make  
10 one comment before you go any further. Them  
11 100 coworkers, I'm pretty fairly certain that  
12 they were all miners and they would not  
13 reflect on what took place in the Flats.

14 DR. MAURO: That's one of the  
15 subjects we'll be talking about. Because by  
16 the way, John, the information that you have  
17 forwarded to the work group, to NIOSH and the  
18 Board, was very much part of the genesis of  
19 how this supplement came about. So we'd like  
20 to thank you for providing the input that you  
21 have provided, because it is material that was  
22 important to us in preparing this addendum.

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1 MR. FUNK: Well, thank you, John.

2 CHAIRMAN PRESLEY: This is Bob  
3 Presley. Before we go on, I want to make a  
4 statement that at this point we're going to be  
5 able to put the removal of badges to bed as an  
6 item, is that correct? Anybody have any more  
7 on that?

8 MR. ROLFES: The NIOSH position is  
9 that this issue is closed.

10 CHAIRMAN PRESLEY: Right. I  
11 wanted to make sure. And then the re-  
12 suspension tables?

13 MR. ROLFES: We did propose, you  
14 know, as Jim had stated, we proposed we'd  
15 consider considering both the mass loading  
16 model and air monitoring data to  
17 reconstruction ambient intakes from monitored  
18 workers and working in forward areas.

19 That's, you know, up ultimately to  
20 the Advisory Board or to SC&A to decide how  
21 the path forward goes.

22 MR. MAKHIJANI: Mr. Presley, just

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1 on the badging question, just for the record  
2 so it's clear, for the workers that we  
3 interviewed mainly from the '80s and '90s, I  
4 think, we did conclude that there was a  
5 pattern of people -- their badges because they  
6 were afraid to damage. And there has been no  
7 further investigation at the election of the  
8 Working Group.

9 DR. MAURO: I'd like to add  
10 something to that, too. We also concluded  
11 based on that, the two pieces of work, the  
12 group of 10 workers that we looked at the  
13 badges plus these interviews, we did not find  
14 evidence, though there was clearly widespread  
15 practice of badges left behind, we do not  
16 believe that the -- the information that we  
17 found did not provide evidence that it could  
18 adversely affect the ability of NIOSH to  
19 perform dose reconstruction and build coworker  
20 models.

21 CHAIRMAN PRESLEY: Thank you very  
22 much, John. Appreciate that.

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1                   MEMBER CLAWSON: I do have one  
2 question though. Mark, you told us that the  
3 information that Mr. Funk has generated to us  
4 has been put in there and that it's been  
5 addressed onto the O: drive.

6                   MR. ROLFES: That's correct.

7                   MEMBER CLAWSON: Where is it? All  
8 I can find is the John Funk letter. I thought  
9 that there was something in there and I've  
10 been trying to find this file for quite a  
11 while now.

12                  MR. ROLFES: Okay. There's a  
13 couple of matrices. They're PDF files. I  
14 believe there's two or three.

15                  MEMBER CLAWSON: I'm not holding  
16 up the meeting for that. If you could find  
17 that for me, I've spent numerous times trying  
18 to find this and I just want to make sure --

19                  MR. ROLFES: There's a lot of  
20 documents out there.

21                  CHAIRMAN PRESLEY: Oh, I've got a  
22 hard copy. That's the only way I can keep up

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1 with it.

2 MEMBER CLAWSON: Yes, I just  
3 wanted to make sure, because there was the job  
4 function letter and there was supposed to be  
5 a NIOSH response to the issues and so forth  
6 and I wanted to make sure that that was -- and  
7 I have been unable to find it. I found the  
8 letter itself, but that's it.

9 MR. ROLFES: I'll look while we're  
10 discussing.

11 MEMBER CLAWSON: Yes.

12 MR. ROLFES: And I'll see if I can  
13 find the location. I'll read it into the  
14 record for you.

15 MEMBER CLAWSON: Well, yes, if  
16 you'd just find that and then I'll find out  
17 where it's at.

18 CHAIRMAN PRESLEY: Okay. And then  
19 on the re-suspension, does anybody got any  
20 questions?

21 DR. ANSPAUGH: Just one comment.  
22 I'm very much in favor of what Dr. Neton

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1 proposed as a hybrid approach. Personally, I  
2 think the documented approach available now is  
3 not adequate for all the reasons that were  
4 given in our report. So unfortunately, we  
5 don't have this hybrid model before us. So I  
6 don't think we can close the issue until we  
7 actually have such a hybrid approach before  
8 us.

9 DR. NETON: Well, it's not  
10 necessarily a hybrid model. It would be a use  
11 of two individual models depending upon the  
12 category of workers whose dose was being  
13 reconstructed.

14 DR. MAURO: In principle,  
15 recognizing that the actual methodology, what  
16 data sets they would use in terms of the area  
17 activity on surfaces, you know, and who you  
18 would assign what mix of airborne dust-  
19 loading. There's lots of fine structure to  
20 ultimately implement a coworker model along  
21 those lines, but this is an area that I'm very  
22 familiar with. And in principle, since we did

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1 discuss this at length earlier, the concept  
2 and the approach, when it was being  
3 considered, I feel as if it was thoroughly  
4 vetted and the fundamental methodology that  
5 was outlined at that time was found to be  
6 favorably by SC&A. I am just operating on the  
7 assumption that that fundamental approach is  
8 basically the type of approach you're  
9 entertaining right now.

10 DR. NETON: It would be exactly  
11 that approach.

12 DR. MAURO: And so I feel  
13 confident we can say with a degree of  
14 confidence that certainly we would like a  
15 review from this issue. I think we have that  
16 -- you know, the work group would like to  
17 review it. The work group would like to  
18 review it and we certainly are available to  
19 review it, but based on the experience we've  
20 had in the past, I'm optimistic that that will  
21 work out favorably.

22 CHAIRMAN PRESLEY: And, Jim, if

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1 it's acceptable with the Working Group, I  
2 would like to ask you to come up with a white  
3 paper, so to speak, or some kind of a -- and  
4 I know you all have a tremendous amount to do  
5 before we get to this meeting in Amarillo, but  
6 if you could come up with some type of a  
7 statement to the effect that this is the way  
8 that we're going to do business. Or if you  
9 come up with some reason that we can't do  
10 business this way, if you would let us know  
11 and then we can go back and discuss it some  
12 more.

13 MR. ROLFES: We do have Gene  
14 Rollins on the line and he's been very heavily  
15 involved in these calculations in developing  
16 this methodology.

17 Gene, is there anything you might  
18 have to add and does what we are discussing  
19 sound feasible to you and reasonable?

20 MR. ROLLINS: Yes, the model was  
21 under development and I brought the specifics  
22 to a meeting. And we discussed it and John

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1 Mauro had some concerns that there was too  
2 much conservatism in it because I had put  
3 conservatism in every step of the calculation.  
4 And at that time, as I remember, I was given  
5 permission by Bob Presley to ask John Mauro to  
6 help me become more reasonable in some of  
7 these assumptions for the mass loading model.

8 CHAIRMAN PRESLEY: That's correct.

9 MR. ROLLINS: And that information  
10 was never forthcoming. That would be very  
11 helpful.

12 DR. MAURO: Gene, the information  
13 I can provide is I have quite a bit of  
14 literature and data on dust loadings from a  
15 wide variety of sources and different  
16 activities.

17 MR. ROLLINS: Well, that was only  
18 one of about four, as I remember --

19 MR. FUNK: Four or five.

20 MR. ROLLINS: -- significant  
21 conservatisms that were in my original  
22 calculations.

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1 MR. FUNK: Correct.

2 DR. NETON: Well, I think those  
3 conservatisms might be okay given the  
4 population to which we're applying this model.  
5 That's what I'm suggesting. My recollection  
6 was that was the major issue that Dr. Anspaugh  
7 had, was applying this model to these work  
8 areas that were like essentially controlled  
9 areas outside, but they weren't adequately  
10 bounding for work activities. So, I think  
11 we're okay here.

12 DR. MAURO: I mean, if there's  
13 anything that I could do to provide you with  
14 information that I committed that I would  
15 provide, I will be glad to. I don't know what  
16 that is.

17 DR. NETON: Yes, let's let NIOSH,  
18 you know, get together, discuss this and we'll  
19 put out our --

20 DR. MAURO: Yes.

21 DR. NETON: -- a more refined  
22 approach here.

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1 MR. FUNK: But the actual  
2 development of the model is complete. I just  
3 have to write it up. It could be done pretty  
4 quickly.

5 DR. NETON: Exactly. So I think  
6 we're okay with that.

7 CHAIRMAN PRESLEY: If you'll give  
8 me a copy of that, then we will get that  
9 distributed, Ted and I.

10 DR. NETON: In my mind, the major,  
11 the remaining issue then is to whom this model  
12 -- you know, how you triage the model. That's  
13 a judgment call that's made very often in this  
14 program as to who is the more -- who is an  
15 active worker versus who's an administrative  
16 worker, that sort of thing.

17 MR. FUNK: There's one more point  
18 here that I'd like to bring up, if I could.  
19 The supporting documents to the site profile,  
20 such as the test by name and date, they still  
21 have not identified the shaft tests that were  
22 shafts, drilled shafts and they still have not

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1 identified those shafts that were mine shafts,  
2 which require the services of two entirely  
3 different operations, two different  
4 procedures. And there was a couple other  
5 supporting documents that haven't been --

6 MR. KATZ: John? John? John, can  
7 you -- I understand you have these issues.  
8 There not germane to what's being discussed at  
9 this moment though. If you could hold onto  
10 those until we get to issues of shafts and so  
11 on, that would be great.

12 MR. FUNK: Well, can I have my  
13 time to make my presentation?

14 MR. KATZ: Well, John, as I had  
15 discussed with you, you're welcome to when  
16 we're discussing matters that you have input,  
17 just as we do with other petitioners, you're  
18 welcome to provide your input at those points.  
19 But if you would just wait until we're  
20 addressing the issue that you have a concern  
21 about, that would be great.

22 MR. FUNK: I would believe that

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1 this model though with its test by name and by  
2 date, if you don't identify, if you haven't  
3 properly identified what type of shafts they  
4 were. You're not --

5 MR. KATZ: John. John. John.  
6 John, the model that's being discussed at the  
7 moment is a sort of that ambient model being  
8 applied to workers. It's not germane to the  
9 population that you're concerned about right  
10 now.

11 I just had a question as to -- do  
12 you think that this work in developing this  
13 model to the extent that it can be presented  
14 can be done in time for the Amarillo update  
15 that's going to be on NTS or --

16 DR. NETON: I'm not sure.

17 MR. KATZ: Okay. I just --

18 DR. NETON: Probably not.

19 CHAIRMAN PRESLEY: What we can do  
20 -- Jim, that's right.

21 MR. KATZ: There's not much time.

22 CHAIRMAN PRESLEY: There's not a

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1 whole to of time. It would be nice if they  
2 could do that and make this part of the  
3 update. Yes, if you can't, I would understand  
4 it and then we'll go on down the road at a  
5 later date. But if you can, it would be nice  
6 to have a presentation, some short  
7 presentation when we do this update to the  
8 Board on where NTS stands on this coworker  
9 model. I mean, not coworker model but the --

10 DR. NETON: So you're suggesting a  
11 presentation on our proposed approach?

12 CHAIRMAN PRESLEY: Yes, sir.

13 DR. NETON: To the full board?

14 CHAIRMAN PRESLEY: Yes, sir.

15 DR. NETON: Yes, we can certainly  
16 do that. I mean, I think I can do that  
17 whether we're 100 percent complete or not.

18 CHAIRMAN PRESLEY: Is that all  
19 right with the working group?

20 MEMBER CLAWSON: Yes, that's fine.

21 DR. NETON: And we'll do our best  
22 to try to get something out, but even if we

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1 could distribute it to the working group, I  
2 sense there's not sufficient time for the  
3 working group to meet.

4 CHAIRMAN PRESLEY: Right. The  
5 chairman's going to be on the road.

6 DR. NETON: Yes, I'll be happy to  
7 provide a --

8 CHAIRMAN PRESLEY: Thank you, sir.  
9 Okay. John, who do you want to  
10 kick off the coworker model discussion.

11 DR. MAURO: This is Arjun. Arjun  
12 is the principle author with Lynn and I'd like  
13 him to --

14 MR. MAKHIJANI: Yes, and as you  
15 know, John -- Bob Barton, are you on the  
16 phone?

17 MR. BARTON: Yes, I am, Arjun.

18 MR. MAKHIJANI: Okay. So, Bob  
19 really did a lot of the -- almost all of the  
20 data compilation, together with our team at  
21 SC&A. So, Bob, you know, please feel free to  
22 add things as I go along or at the end. I'm

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1 going to try to keep it very brief so we can  
2 actually have a discussion.

3 Just to remind you, we did present  
4 this paper in October. I'll just summarize  
5 the main conclusions from that paper because  
6 this is a supplement to the earlier one. In  
7 that earlier paper, we found that monitoring  
8 frequency for internal dose was not correlated  
9 with external dose and there were  
10 inconsistencies, many inconsistencies in the  
11 bioassay results for gamma emitters and for  
12 plutonium, and there were very substantial  
13 questions about the quality of the data, if I  
14 remember correctly, until 1987, especially for  
15 gamma emitters and plutonium.

16 To the extent that the data can be  
17 considered reliable, radsafe personnel had the  
18 highest exposure potential for some  
19 radionuclides, but this is not demonstrated  
20 for all radionuclides. Although really when  
21 we did the supplemental report and did  
22 comparisons, we found it very difficult to

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1 actually establish who has the highest  
2 exposure potential because other groups of  
3 workers have practically no data for many  
4 types of bioassay.

5           And that NIOSH statement that all  
6 100 individuals identified as having  
7 significant external whole body photon  
8 exposures were monitored by bioassay during  
9 their employment. This is from the NIOSH  
10 evaluation report, that this statement was not  
11 correct for all 100 workers and all relevant  
12 categories of radionuclide. So that was from  
13 our analysis earlier on.

14           We did a supplemental analysis and  
15 Mr. Funk would be interested to know, as John  
16 Mauro pointed out, that there were concerns  
17 raised whether this group in Table 7-1 of the  
18 evaluation report was representative and  
19 especially of the workers in the Flats, rather  
20 than being predominantly representative of  
21 tunnel workers. And so there was a fair  
22 amount of investigation of the whole question

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1 that was reopened at the time and I'll just go  
2 over our main findings.

3 We looked again at this question  
4 of external dose and were a little surprised  
5 to find that for the 75 workers with the  
6 highest cumulative external dose, more than  
7 half of that external dose had actually been  
8 incurred or received in the pre-1963 period,  
9 which is not relevant to the SEC period. So  
10 there can be no question of correlation of  
11 that, at least so far as we could see, with  
12 the internal dose received in the underground  
13 testing period starting in 1963. So the basis  
14 for compilation of that Table 7-1 is very much  
15 in question.

16 We also found that cumulative  
17 external exposure potential was not correlated  
18 with the highest values of bioassay data and  
19 the various bioassay categories. And just to  
20 remind what those were, those were plutonium,  
21 gamma, gross fission products and tritium.

22 DR. MAURO: And iodine.

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1 MR. MAKHIJANI: And iodine. Thank  
2 you. Five categories. And within iodine  
3 actually there are sometimes subcategories.

4 And taken together, these findings  
5 from the earlier report and especially from  
6 this analysis, one of our principal  
7 conclusions is that NIOSH's selection criteria  
8 for cumulative external dose being indicative  
9 of the highest internal dose is not  
10 appropriate for the construction of an  
11 internal exposure model, a coworker model. So  
12 Table 7-1, we don't believe is an appropriate  
13 basis for a coworker model. And there's  
14 further evidence to that effect in the  
15 supplemental analysis.

16 As regard to the question of the  
17 representativeness of the workers, whether  
18 they were in the tunnels or the Flats, we did  
19 an analysis of that; and, Lynn, please amplify  
20 if you think it necessary, we did conclude  
21 that the tunnel workers were over-represented  
22 or the Flats workers were under-represented so

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1 far as we could see. Now the --

2 (Off-mic comment.)

3 MR. MAKHIJANI: I'm sorry?

4 MR. ROLFES: I'm sorry. I was  
5 talking to Jim.

6 MR. MAKHIJANI: Yes, no problem.  
7 You can certainly amplify there some.

8 MR. ROLFES: Yes, that's true.  
9 Actually the majority of the radiation  
10 exposures did in fact occur in the tunnels  
11 rather than in the Flats.

12 MR. MAKHIJANI: Yes, that wasn't a  
13 question as to where the majority of the  
14 exposures occurred. I mean, the specific  
15 thing that is being asserted here in the  
16 conclusion was were the workers representative  
17 of the whole group of workers. And the  
18 question of who was most exposed is an  
19 interesting problem actually that arises out  
20 of this analysis.

21 DR. NETON: Over-represented.

22 MR. ROLFES: Right, we didn't

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1 select --

2 MR. MAKHIJANI: The tunnel workers  
3 were over-represented.

4 MR. ROLFES: We didn't select the  
5 workers based on their job categories or their  
6 work location. We selected them based on  
7 highest external doses recorded, which would  
8 be indicative of the high internal potentials.

9 MR. MAKHIJANI: And that's right.  
10 And we have found that that criterion was  
11 inappropriate for several reasons. And so  
12 there are a number of layers at which the  
13 structure in Table 7-1, the selection of those  
14 100 workers seems inappropriate for a coworker  
15 model.

16 Anyway, the idea that the tunnel  
17 workers were over-represented as compared to  
18 other workers was verified, and you agree to  
19 that, so whatever the reasons for that might  
20 be.

21 MR. ROLFES: Because that's where  
22 the highest radiation exposures are.

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1 MR. MAKHIJANI: In examining who  
2 was monitored, we looked one more time at the  
3 Table 7-1 and radiation safety personnel were  
4 by far the dominant group that received  
5 bioassays and NIOSH has said its evaluation  
6 report that this is among the group with the  
7 highest exposure potential and therefore these  
8 can be a satisfactory basis. But we found  
9 that other groups of workers really had almost  
10 no data in most periods, and most likes of  
11 data. There are some exceptions and that's  
12 fine grain. It can be found in the report and  
13 I can go over it, if you would like.

14 CHAIRMAN PRESLEY: Arjun, do you  
15 recall what workers at this point had no  
16 exposure data?

17 MR. MAKHIJANI: Yes, most other  
18 groups of workers -- let me pull up the table,  
19 Mr. Presley. That was actually in our last  
20 report.

21 MR. BARTON: Arjun, I can find --  
22 just to make a note here --

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1 MR. MAKHIJANI: Yes. Yes, go  
2 ahead, Bob.

3 MR. BARTON: As far as what we've  
4 investigated, specific categories, in addition  
5 to rad safety, miners often had a semi-decent  
6 amount of bioassay. And then security  
7 personnel as well, particularly I believe in  
8 the later period, but I'm not completely  
9 certain on that.

10 MR. MAKHIJANI: Miners had  
11 bioassay data for tritium mainly. And  
12 security personnel had monitoring data for the  
13 1980s. So as I was saying, there are some  
14 fine grain structure and some exceptions, but  
15 if you look at plutonium, for example, the  
16 non-health physics or radsafe categories or  
17 workers had very, very little monitoring data.  
18 Laborers, for instance, had very little  
19 monitoring data. Craft workers had little  
20 monitoring data.

21 DR. MAURO: Arjun, does Table 1 in  
22 our report, page 21 -- is that one of the

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1 places where there might be an indication of  
2 -- I see a table; I'm looking at it. This is  
3 Table 1 on page 21. It sort of captures --

4 MR. MAKHIJANI: Yes.

5 DR. MAURO: -- at least some of  
6 this information. It's called "Summary of  
7 Work Locations and Bioassay Data of 100  
8 Employees From Table 7-1." And I see a column  
9 saying whether or not there's any bioassay  
10 data.

11 MR. MAKHIJANI: Yes. That's  
12 right. Plutonium bioassay data.

13 DR. MAURO: This is only  
14 plutonium, right.

15 MR. MAKHIJANI: So you can see  
16 that most workers had no plutonium bioassay  
17 data.

18 MEMBER ROESSLER: That actually  
19 starts on page 19.

20 DR. MAURO: Okay. Thank you.

21 MR. ROLFES: Yes, the most likely  
22 element or isotope that you're going to be

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1 exposed to at the Nevada Test Site would be a  
2 fission product though. So it would make  
3 sense that there's much more fission product  
4 data than there are plutonium bioassay data.

5 MR. MAKHIJANI: There's very  
6 little fission product data, too. I can go to  
7 our last report and actually give you the  
8 detail on that, but you have to bear with me  
9 because I have the --

10 MR. ROLFES: Miners obviously have  
11 a lot of tritium bioassay data because they  
12 were working in confined areas underground.  
13 And that's where the potential for tritium  
14 exposure existed.

15 MR. MAKHIJANI: Right. So far as  
16 fission product and gamma analysis is  
17 concerned, here is the summary of plutonium.  
18 We have all of these summaries in the last  
19 report, so I can actually tell them to you.

20 DR. NETON: For my edification  
21 because I'm probably not as up to speed on  
22 this as you guys all are, could I get sort of

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1 an overview of the classes of worker we're  
2 talking about here? Are we talking about  
3 tunnels workers or are we talking about flats  
4 workers?

5 MR. MAKHIJANI: We didn't  
6 originally categorize them that way and none  
7 of the sampling is actually according to  
8 tunnel or flats workers.

9 DR. NETON: Right.

10 MR. MAKHIJANI: That was a  
11 separate investigation that was done, Jim, as  
12 a result of Mr. Funk's concerns about  
13 representativeness of the area in which  
14 workers worked and where most of the tests  
15 were. Maybe Lynn wants to amplify on that a  
16 little bit.

17 DR. ANSPAUGH: Well, I think the  
18 result of the analysis shows that of the more  
19 than 700 tests conducted at Nevada Test Site  
20 post-1962, 89 percent of them took place on  
21 the Flats. And if you look at the releases,  
22 the releases to the atmosphere also 89 percent

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1 of the releases took place on the Flats.

2 DR, NETON: We're talking about  
3 venting of these tests, right?

4 CHAIRMAN PRESLEY: Yes, but 89  
5 percent of the venting, how many vented?

6 MR. MAKHIJANI: Well, there were  
7 more than 200 vents.

8 DR. ANSPAUGH: There was 300-and-  
9 something. It was --

10 MR. MAKHIJANI: It's in the  
11 report.

12 DR. ANSPAUGH: It was a very  
13 large --

14 DR. NETON: I don't want to get  
15 too far into this. I just wanted to get a  
16 characterization in my mind what population --

17 MR. MAKHIJANI: Yes, we can tell  
18 you how many vented.

19 DR. NETON: Because we had just  
20 talked about this sort of dust-loading model  
21 to estimate dose and re-suspension of  
22 materials from work activity. But now I'm

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1 hearing this other source term which is the  
2 venting possibly that needs to be added back  
3 into that exposure scenario.

4 DR. MAURO: In concept, it's clear  
5 that the 100 workers --

6 MR. MAKHIJANI: The number of  
7 events is 329 and it is in Figure 2 on page  
8 11.

9 CHAIRMAN PRESLEY: Now, as I read  
10 this, when you say venting, is that somewhere  
11 where the airplane got a little bit of a sniff  
12 as it rolled across after the test, or is this  
13 something that was taken at ground level  
14 immediately after the shot? Or is there a  
15 report that says how many actual ventings took  
16 place that would have endangered the public?

17 MR. ROLFES: When the ventings  
18 occurred, were there workers in that place  
19 where the venting occurred, and we know there  
20 were not workers at the subsidence craters.

21 DR. ANSPAUGH: Well, in some cases  
22 there were workers at the subsidence craters.

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1 In fact, sometimes workers were standing on  
2 top of it when it did subside.

3 But, Mr. Presley, the answer to  
4 your question is all of the above. The list  
5 which is given in the appendix is taken from  
6 a DOE report authored by Shoengold and DeMar,  
7 and one other person, which includes anything  
8 ranging from a controlled release up to a  
9 massive uncontrolled release, which would have  
10 been detected off-site even beyond the range  
11 of the country. So it includes everything.  
12 And captured in the appendix are the amount of  
13 material that vented. Sometimes it's a trace.  
14 Sometimes it's about 10 million curies. So,  
15 everything.

16 CHAIRMAN PRESLEY: But I want  
17 everybody to understand that this goes from a  
18 microcurie up to 10 million curies. And the  
19 amount of 10 million curies ventings were  
20 very, very low. Is that correct?

21 MR. MAKHIJANI: The large  
22 ventings, Mr. Presley, were between '63 and

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1 the Baneberry venting in December 1970, with  
2 the exception of Mighty Oak in '86.

3 CHAIRMAN PRESLEY: Right.

4 MR. MAKHIJANI: And after 1971,  
5 with one exception -- well, Lynn should --

6 MR. ROLFES: Let me interject,  
7 please. When you're discussing a venting,  
8 typically that is not any actinides. It's  
9 typically radioiodines, other gaseous fission  
10 products such as xenon, rubidium, things like  
11 that that are volatile. Those are the things  
12 that are able to permeate through the ground  
13 and up through the cracks after a test is  
14 done. The actonizer typically either burned  
15 in the detonation or remained in the cavity.  
16 The gaseous materials are typically able to  
17 vent, but they are typically contained. When  
18 they are able to vent though, those typically  
19 do not present an internal exposure hazard for  
20 workers that are in the test site area. Those  
21 gaseous radionuclides are more likely to  
22 present an external dose hazard to people, and

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1 they do quickly decay as well.

2           The people that would have  
3 potentially been exposed in those areas would  
4 have significant recorded external doses on  
5 their dosimetry. And that would be an  
6 indicator to us to say, well, they should have  
7 some bioassay data. They should have been  
8 monitored for internal exposures. If they've  
9 got a significant external dose, then those  
10 people should have been monitored. That would  
11 trigger us to look whether there are bioassay  
12 data. If there's not, then those would be the  
13 people that need to have a bioassay coworker  
14 -- excuse me, a coworker intake model applied  
15 to them. So, thank you.

16           DR. MAURO: I'd like to add on --

17           MR. FUNK: I'd like to point an  
18 error on this the point about post-1992 and  
19 pre-1992, if I could?

20           Post-1992 the test site, before  
21 the closed it up, had very little clean up  
22 except for the tower, picking up the metal and

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1 then other objects around there. Since 1994,  
2 the whole entire Flats has been plowed and  
3 windrowed under. If there was no potential  
4 for a health hazard there, why did they spend  
5 all of them millions and millions of dollars  
6 going out there plowing the entire test site  
7 underground? And I believe there could be  
8 some confusion here of reports of exposure  
9 possibilities pre-1992 and post-1992. So I  
10 think that we should look further into this to  
11 find out where these figures we're working  
12 with, where they come from and what time  
13 period they came from. Thank you.

14 DR. MAURO: I did want to add one  
15 more item that's related to what John just  
16 indicated and Mark. The point you're making  
17 regarding ventings and noble gases and  
18 iodines, that's what comes out. We also have  
19 a section a report that points out though that  
20 there were historical safe tests where there  
21 were areas where there was plutonium. And  
22 it's those very same areas where the tests,

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1 the shaft tests or the bore hole tests took  
2 place. So though the actual venting of a test  
3 might be as you described to a large extent,  
4 we can't forget about the fact that the ground  
5 under which that test took place very often  
6 had considerable plutonium and perhaps other  
7 radionuclides.

8 MR. ROLFES: Yes, that's very  
9 true. There are some isolated portions of the  
10 test site where there were some plutonium  
11 experiments conducted. And there were people  
12 that were involved in conducting reentries  
13 into those areas. Those people participated  
14 in a bioassay program to look specifically for  
15 plutonium. Some of them as well also had some  
16 significant external doses.

17 MR. FUNK: You're wrong about the  
18 flats worker. There was no bioassay --

19 MR. KATZ: John, please. John,  
20 please. Please, please, at least let a  
21 speaker speak.

22 MR. MAKHIJANI: Bob and Lynn, Bob

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1 Barton and Lynn actually conducted quite a bit  
2 of investigation into this very question as to  
3 whether we could find significant plutonium  
4 data for workers who worked, who were  
5 identified as working in those areas.

6 Lynn, maybe you can go into that.

7 And Bob Barton who actually  
8 compiled the data could also explain our  
9 findings.

10 DR. ANSPAUGH: Well, there are  
11 several areas at Nevada Test Site that has  
12 significant plutonium contamination and this  
13 is indicated in our report. It was Area 5  
14 where they did so called hydrodynamic tests.  
15 And also Area 9, which there was four non-  
16 nuclear explosions, three of which at least  
17 scattered plutonium to the extent that the  
18 name of the location became known as Plutonium  
19 Valley. I'm sorry, that was Area 11. And  
20 then Area 9 there were a lot of tests that  
21 were done before the 1962 period, but which  
22 caused substantial amounts of airborne

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1 plutonium, as mentioned in NIOSH in your  
2 report as having the highest plutonium levels  
3 around, and that was in Area 9.

4 In our looking through the data on  
5 plutonium bioassays, it appeared to be that  
6 there was very little attention paid to the  
7 people who were working in those areas,  
8 although it's very difficult on the basis of  
9 the data we have to know exactly where  
10 somebody was at any particular day.

11 There were also, as I mentioned in  
12 this report and otherwise, there were  
13 plutonium experiments done in 1963 that were  
14 to the northwest of the site. Three of those  
15 tests had material detected off site and I  
16 think if material is detected off site, it  
17 probably also got throughout the test site.

18 Now another one of the issues that  
19 you mentioned was about how all the seeps were  
20 just little trivial amounts of radioiodine or  
21 noble gases. You know, in some cases that's  
22 absolutely true. There's no doubt about that.

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1                   MR. ROLFES: There are exceptions  
2 to everything.

3                   DR. ANSPAUGH: In other cases  
4 there were massive events. In Baneberry, as  
5 an example, the manager was so upset about the  
6 result of that test he shut down the test site  
7 for about six months. And he set up a much  
8 more rigorous method of controlling these  
9 massive events, and I think that was largely  
10 successful after 1970. That was really the  
11 last major event that occurred at the Nevada  
12 Test Site.

13                   So you have all kinds of different  
14 situations. You have people exposed to big  
15 events. And also I think the assumption that  
16 you have in a high external dose you have a  
17 high internal dose, is not true in a broad  
18 sense. For example, if you look at your Table  
19 7-1 people, as near as I can tell the highest  
20 dose in there is 593 rem dose to the thyroid.  
21 This person did not have an unusually high  
22 external dose.

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1 Another example that happened --

2 MR. ROLFES: But they did have  
3 external dose.

4 DR. ANSPAUGH: He did, yes.

5 MR. ROLFES: Yes.

6 DR. ANSPAUGH: But not unusually  
7 high.

8 MR. ROLFES: Well, the majority of  
9 the badge --

10 DR. ANSPAUGH: Well, let me  
11 finish.

12 MR. ROLFES: Okay. Go ahead.

13 DR. ANSPAUGH: And another event  
14 was the Merlin event, which was on the Flats  
15 in a person that had a fairly high dose to the  
16 thyroid. As I recall, it was maybe 20 rem and  
17 they had essentially an insignificant external  
18 dose. So I don't think that association is  
19 necessarily true. And certainly if you're out  
20 in the middle of a plutonium field, you're not  
21 going to have any external dose, but you could  
22 be kicking up dust that you inhale to get an

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1 internal dose.

2 MR. ROLFES: Right.

3 DR. ANSPAUGH: So there's lots of  
4 exceptions to it.

5 MR. ROLFES: Yes, there are  
6 exceptions.

7 DR. ANSPAUGH: I think there are  
8 lots of exceptions.

9 DR. ROLFES: Sure. Well, I think  
10 for the kicking up dust, our think our mass  
11 loading re-suspension model will account for  
12 that appropriately.

13 For an individual that has  
14 internal dose, there are some exceptions, yes.  
15 There are some examples where people in the  
16 Plains that were doing sampling for the  
17 Plowshare experiments received some  
18 significant internal doses and significant  
19 external doses as well. We acknowledge that  
20 there are exceptions. We're not saying that  
21 there's never internal exposures. But what  
22 we're trying to do, we know that the majority

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1 of the NTS work site, the majority of the  
2 individuals that work there did not receive  
3 any significant external doses. When we see  
4 an individual that did in fact receive an  
5 external dose, that triggers us. We know that  
6 that person could have had an internal  
7 exposure potential because they participated  
8 in a reentry, because they worked in a  
9 radiologically-controlled area.

10 MR. MAKHIJANI: A large part of  
11 this report actually goes to the investigation  
12 of that question.

13 DR. NETON: I'd like to speak a  
14 little bit about that.

15 MR. MAKHIJANI: Yes. And, for  
16 instance, the Areas 5, 9 and 11 that Lynn was  
17 talking about were specifically looked at.  
18 And pretty much the conclusion was the same as  
19 for other plutonium bioassays. Only the  
20 radsafe type of personnel have any real  
21 monitoring for plutonium. No other group of  
22 workers who had entered 5, 9 and 11 -- I think

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1 there's only one sample from the Table 7-1 set  
2 for any other worker and he was in one of  
3 those areas for less than a week, at least so  
4 far as we could determine from the records.

5 DR. NETON: Okay.

6 MR. MAKHIJANI: So even in the  
7 high plutonium areas, only the radsafe type of  
8 personnel have this data.

9 And just to answer your earlier  
10 question about the exposure would be not to  
11 plutonium but to gross fission products,  
12 that's actually in our earlier report. If you  
13 look at the plutonium results, the numbers of  
14 bioassay and the gross fission product results  
15 in terms of bioassay, they're actually quite  
16 comparable. So Table 6 on page 30 of the  
17 October report shows that for laborers,  
18 welders, environment, there were almost no  
19 samples. Just two among the whole group for  
20 laborers from 1963 to 1967, and eight for  
21 miners, and none in the 1967 period.

22 If you look at --

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1 MR. ROLFES: They were --

2 MR. MAKHIJANI: -- those are --

3 MR. ROLFES: -- radioactively-  
4 controlled areas.

5 MR. MAKHIJANI: Now these are the  
6 NIOSH people with the high exposure potential,  
7 so presumably we're only looking at people  
8 with high exposure potential and defined in  
9 the evaluation report. Now if you look at the  
10 distribution of gross fission product samples,  
11 which is on page 42 of the report, throughout  
12 the period laborers had zero gross fission  
13 product bioassay. Welders had zero, wiremen  
14 had one, and miners had 14. And so you can  
15 see this sampling. And then you have to  
16 analyze the periods. You know, you have to  
17 look at when there were ventings, when there  
18 was higher exposure potential. And the data  
19 are pretty sparse.

20 The bottom line on a lot of this  
21 stuff is the basis to compare radsafe workers  
22 for whom there are data to other groups of

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1 workers and establish that radsafe workers  
2 were among the people with the highest  
3 exposure potential does not appear to exist.

4 MR. ROLFES: Well, workers weren't  
5 selected to participate in the bioassay  
6 program based upon their job title. It was  
7 based upon their job duties and work  
8 locations. That's the important thing that we  
9 have to remember.

10 DR. ANSPAUGH: I would take  
11 exception to that. I think the security  
12 people, for example, were deliberately picked  
13 to be monitored in the 1980s --

14 MR. ROLFES: Correct.

15 DR. ANSPAUGH: -- with the belief  
16 that they were canaries and would represent an  
17 early warning system. And in the early days,  
18 going back to '61 and '60, I think the miners  
19 were typically a focus of intensive monitoring  
20 because they had high exposure to tritium.

21 MR. ROLFES: Right.

22 DR. ANSPAUGH: But what happened

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1 in '60 and '61, '62 is not necessarily a good  
2 model for what went on in post-1962.

3 MR. ROLFES: Okay. Yes, that's  
4 true. The guards did in fact participate in  
5 a routine bioassay program in the 1980s. And  
6 they would be indicative of individuals that  
7 were roving across the site. Their data would  
8 be useful to NIOSH as well for reconstructing  
9 internal exposures. The guards were typically  
10 controlling access to areas where there were  
11 radiologically-contaminated materials, soils  
12 where work was being done. I don't dispute  
13 that in any manner.

14 MR. FUNK: True, there was no  
15 guards on the four shot events. The guards  
16 left immediately after the shot was over.  
17 There was no guards there after that.

18 DR. ANSPAUGH: I think the fact is  
19 the guards had almost no external dose and  
20 almost no internal dose. And so in that  
21 sense, they weren't very good canaries.

22 MR. ROLFES: Well, I don't know

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1 whether there's positive or non-positive  
2 bioassay data. You know, it's still bioassay  
3 data, whether we have a positive result or a  
4 non-positive. A non-positive result is  
5 equally as valuable to NIOSH as a positive.

6 MR. MAKHIJANI: It's only valuable  
7 in a coworker model if the group of workers is  
8 representative of those at the highest  
9 exposure potential. And what Mr. Presley or  
10 Dr. Anspaugh are saying is with the security  
11 guards in the '80s, that doesn't appear to be  
12 the case. And actually you wouldn't expect  
13 them to be the middle of the work in the  
14 radiological areas if they were simply  
15 guarding entry.

16 DR. NETON: Well, for the moment  
17 they're not in our model.

18 MR. MAKHIJANI: Yes. Right. So  
19 but then, you know, it's kind of either they  
20 are in the model or not in the model, but you  
21 hear both things. They're going to be used in  
22 the model or they're not going to be used in

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1 the model.

2 MEMBER SCHOFIELD: Any time you're  
3 working in a area with loose contamination and  
4 you start walking around that area, you start  
5 moving equipment in that area, you can wind up  
6 very little or almost no external, but you can  
7 pick up one heck of a big dose in a hurry  
8 internally. And if you're not being monitored  
9 for that, there is no way they're going to  
10 know that.

11 DR. NETON: Well, I think that we  
12 proposed earlier to cover re-suspension of the  
13 material on site by taking the highest area of  
14 a contamination and developing some sort of a  
15 dust-loading of five milligrams per cubic  
16 meter, something of that nature.

17 DR. MAURO: I think that strategy  
18 goes a long way toward those workers who were  
19 not gaining access to controlled access areas.

20 DR. NETON: Correct. Exactly.

21 DR. MAURO: So I would agree that  
22 lots of problems have been resolved with the

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1 approach you described. But what we're really  
2 talking about is known. We're areas where  
3 there was controlled access, which is a  
4 completely different exposure setting and  
5 scenario.

6 DR. NETON: Exactly.

7 DR. MAURO: And one of the things  
8 that I think really is the rock that you built  
9 your house on was selecting those 100 workers  
10 that had the highest cumulative gamma  
11 exposure. And the premise being, well, those  
12 are the ones. I don't want to lose site of  
13 that.

14 DR. NETON: Right.

15 DR. MAURO: And now I would like  
16 to ask, and I won't take the time, but I'd  
17 like you to go to page 44 on our report, you  
18 know, the supplemental report. Because we  
19 looked at that very carefully and listened.  
20 Was there any merit, any reason to believe  
21 that they; and that is, the 100 workers,  
22 whether there's any relationship between

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1 cumulative gamma exposure and the results of  
2 the bioassay tests. And we looked at it for  
3 all the different radionuclides.

4 On page 44, if you have it in  
5 front of you --

6 DR. NETON: Yes, I see that.

7 DR. MAURO: It's a plot. On the Y  
8 axis is the maximum urine concentration  
9 observed for plutonium versus the cumulative  
10 gamma dose. It's a scatter graph. No  
11 relationship.

12 DR. NETON: Right. And let's talk  
13 about that a little bit.

14 DR. MAURO: Sure.

15 DR. NETON: I think first that we  
16 never indicated there was a direct linear  
17 correlation with gamma exposure and exposure  
18 to internal. I mean, we've never said that.  
19 We said that measuring external exposure is  
20 indicative of work in radiological areas. To  
21 have external exposure on your badge, you  
22 certainly had to be working in some kind of an

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1 area where there was a source term. Okay? So  
2 that in and of itself was sort of our litmus  
3 test. The fact that there was a scattered  
4 gram here to me demonstrates that you've  
5 proven that there's very little really about  
6 the detection limit of the bioassay  
7 measurements. Many of these samples are at  
8 the detection limit or very close to the  
9 detection limit, so a priori, I think this is  
10 sort of a --

11 DR. MAURO: Misleading?

12 DR. NETON: -- misleading  
13 exercise. I mean, I think you could have done  
14 a much better job --

15 DR. MAURO: This happens with  
16 iodine. This happens with -- we've got places  
17 where --

18 DR. NETON: But what I'm saying  
19 though, it's most of the exposures at the  
20 Nevada Test Site were very low and not very  
21 large. So when you have a lot of data near  
22 the detection, when you have quite a bit of

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1 dispersion about the detection limit as well  
2 as the biokenetic variability of the model  
3 which includes the GSBN 3, so you're --

4 DR. MAURO: Well, you're looking  
5 at five orders of magnitude. For five rem  
6 exposure, cumulative exposure, the  
7 concentrations are maximum.

8 DR. NETON: But remember --

9 DR. MAURO: These are maximum  
10 concentrations. Don't spread five orders of  
11 magnitude.

12 DR. NETON: We never said that  
13 there's a direct linear relationship between  
14 internal exposure to plutonium and gamma  
15 exposure. We never said that. We said that  
16 people who have gamma exposure worked in  
17 radiological areas where there were source  
18 terms. So they are more likely to have been  
19 exposed versus someone who had zero measured  
20 exposure externally.

21 MR. MAKHIJANI: There is quite a  
22 bit more than that. I'm just trying to find

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1 the evaluation report.

2 DR. NETON: Well, whatever we  
3 said, I'm saying it now, and what I'm saying  
4 now I think is okay. I mean, I think this  
5 linear correlation thing is sort of a red  
6 herring. I mean, it's just --

7 MR. MAKHIJANI: Well, this comes  
8 directly from what you said in the evaluation  
9 report, that cumulative external exposure is  
10 indicative of internal exposure. It wasn't  
11 that external exposure is indicative of any  
12 exposure potential. And so --

13 DR. NETON: Well maybe that's a  
14 misinterpretation --

15 MR. MAKHIJANI: You chose the  
16 highest external exposure cumulative in  
17 order --

18 DR. NETON: -- those who were  
19 exposed to make sure we had some rad --

20 MR. MAKHIJANI: I'll find the --

21 DR. NETON: I think you're  
22 misinterpreting cumulative rad exposure, that

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1 terminology.

2 DR. MAURO: But nonetheless, my  
3 point is though that those 100 -- there is no  
4 evidence that those 100 people represent the  
5 right group of people to build a coworker  
6 model on. In fact, the evidence seems to be  
7 overwhelming that the real place where people  
8 got internal exposures were at the Flats, and  
9 were different because of the incidents that  
10 we just described and --

11 MR. ROLFES: It's very unlikely.

12 DR. MAURO: And the exposures were  
13 included, as you correctly pointed out,  
14 venting of iodines, some sure were fission  
15 products, but also plutonium and other full  
16 out radionuclides for one group that was  
17 present.

18 Now, so we walk away from this and  
19 grabbed the wrong group of people. And I  
20 don't know how you go about finding the right  
21 group of people to group a coworker model on,  
22 and I don't know you can.

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1 MR. MAKHIJANI: Well, just for the  
2 record, just let me read what's on page 35 of  
3 the evaluation report.

4 It says, "The nature of potential  
5 exposure scenarios at NTS makes it most likely  
6 that significant internal exposure would be  
7 associated with significant external  
8 exposure."

9 That's the reason you see all  
10 those charts, because that's what you said in  
11 the evaluation report and it wasn't borne out  
12 by actually trying to make this association.

13 DR. NETON: I think you've lost me  
14 on that interpretation.

15 MR. ROLFES: We did not say there  
16 was a direct correlation of the --

17 DR. NETON: We're saying those --

18 MR. MAKHIJANI: If there is no  
19 correlation, this statement cannot be  
20 sustained.

21 DR. NETON: There is no --

22 MR. MAKHIJANI: And all --

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1 DR. NETON: Don't you believe that  
2 people who have radiological exposure are more  
3 -- or radiological workers who were exposed to  
4 a source term?

5 MR. MAKHIJANI: Well, then  
6 that's --

7 DR. NETON: In this section of the  
8 re-suspension of materials from -- this is the  
9 ground where there's plutonium-type materials.

10 DR. ANSPAUGH: Well, we have  
11 several cases where we have high thyroid doses  
12 with very little external.

13 DR. NETON: But there are external  
14 doses.

15 MR. ROLFES: That's very true.  
16 Then let me clarify that.

17 DR. ANSPAUGH: But let me just say  
18 one other comment, please. There's a serious  
19 problem here in the sense that we don't know  
20 what your coworker model is. You've only  
21 given a list of people in Table 7-1, that is  
22 one. And you haven't said how you're going to

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1 develop a coworker model. That is a serious  
2 issue I think that clouds all of this.

3 DR. NETON: I will grant you that.  
4 Because then you could do some testing against  
5 the distribution itself. I'll grant you that.

6 DR. ANSPAUGH: So all of these  
7 things are surrogates for actually looking at  
8 your coworker model. Table 7-1 is really all  
9 we have.

10 MR. ROLFES: And we've agreed that  
11 we need to pursue additional bioassay. Maybe  
12 that's the bottom line. So this --

13 MR. MAKHIJANI: And moreover, if  
14 you look at the table, what we did in this  
15 report, just to kind of round out the finding  
16 of the report, is we compared whether -- just  
17 leaving aside the whole external/internal  
18 question, we compared whether the internal  
19 dose as indicated by bioassay results in Table  
20 7-1 was indicative of the highest exposure  
21 potential in those categories, for instance.  
22 And radSAFE was the category for which we have

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1 the most exposure data and we found that the  
2 20 that were selected at random for the SC&A  
3 examination presented in the last report of  
4 the 120 with six job categories, that the 20  
5 radsafe worker category workers had much  
6 higher plutonium bioassay results than the  
7 NIOSH 100. So the NIOSH 100, by any  
8 criterion, is not the right set.

9 DR. MAURO: Go to page 40. Go to  
10 page 40. This is in my mind the single figure  
11 that we compare that really was very  
12 convincing to me. You folks have it in front  
13 of you. It's a graph. And what we're looking  
14 at is the distribution of the concentration of  
15 plutonium in urine. The blue dots represent  
16 the cumulative distribution of the  
17 concentration of plutonium in urine for the  
18 group of 100. Okay?

19 We said, well, you know, let's see  
20 if that how robust that is. So we went in and  
21 we randomly grabbed a group of 20, I believe  
22 it was, and just for assay partners, you know?

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1 So let's go get our group of assay partners  
2 and plot that. And that's the red dots.

3 Now what this is says is that just  
4 going in and grabbing another set of people,  
5 another independent sample of 20 radsafe  
6 workers, we're finding that yes, those at the  
7 median overlap pretty nicely. But up at the  
8 95th percentile our group is substantially  
9 higher. I think in fact they're fives?

10 MR. MAKHIJANI: Five or six.

11 DR. MAURO: Five or six times  
12 higher. So, I mean, this tells me that this  
13 -- and there really was no great heroic effort  
14 made. We just wanted to know, so let's go  
15 grab some and see what happens. And lo and  
16 behold, finding -- we just went in and grabbed  
17 a group of radsafe workers and their, 90  
18 percent of them, concentrations in urine are  
19 six times higher than yours.

20 DR. NETON: You're saying that 20  
21 samples occurred a lot more --

22 MR. MAKHIJANI: No, no. Twenty

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1 workers.

2 DR. MAURO: Twenty workers. I'm  
3 sorry. Twenty workers. These here are 100 --

4 DR. NETON: But multiple samples?

5 DR. MAURO: Yes, that --

6 MR. MAKHIJANI: Yes, all of the  
7 results are represented in the last October  
8 report where we had 20 workers in each of six  
9 categories.

10 DR. NETON: But they had multiple  
11 samples, obviously.

12 MR. MAKHIJANI: Yes.

13 DR. MAURO: Absolutely.

14 MR. MORRIS: Please, can I jump in  
15 on a point here? You made a point that at the  
16 95th percentile it's a factor of five higher.  
17 We don't do dose reconstructions in 95th  
18 percentile of the coworker model. We do dose  
19 reconstructions at the 84th percentile. What  
20 is the delta at that point?

21 DR. MAURO: Oh, no. Then that's  
22 actually at -- well, they're very close.

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1 DR. NETON: Well, we need to be  
2 careful.

3 DR. MAURO: What we're saying is  
4 -- but it goes to show you that they're going  
5 to be -- using your coworker model, there are  
6 going to be workers, at least this -- I guess  
7 this is definitive proof, the doses will be  
8 underestimated.

9 DR. NETON: We need to be a little  
10 careful about that analysis, because we've  
11 observed when you have a small number of  
12 workers with multiple samples, that will skew  
13 your distribution tremendously. In other  
14 words, if you've got a few people in there  
15 that had an incident and they had six bioassay  
16 samples, they're all high --

17 DR. MAURO: Okay.

18 DR. NETON: -- it's not surprising  
19 that your 95th percentile is going to be up  
20 there.

21 DR. MAURO: You know something? I  
22 understand that.

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1 DR. NETON: We're okay when we  
2 have like 10,000 data points and there's a few  
3 workers with multiple samples. We don't go  
4 bother to pull all those out. But when you  
5 have a very small set of workers, you have to  
6 be careful. I would suspect if you took the  
7 average or something of the samples for each  
8 worker and plotted the distribution, that  
9 would come out somewhat differently. But I'm  
10 suspect of that, that plot.

11 MR. ROLFES: Well also, John, can  
12 I ask something quick? What years? Are these  
13 the same years that you're comparing here?

14 MR. MAKHIJANI: Well, they're all  
15 '63 to '92 samples. And this is not  
16 differentiated.

17 DR. NETON: I'm wary of that  
18 analysis because --

19 DR. MAURO: Well, with the small  
20 numbers. In other words, you're saying  
21 that --

22 DR. NETON: Well, the small number

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1 but many multiple samples per worker. Then  
2 you start skewing your -- you know, what's  
3 that representative --

4 DR. MAURO: Well, I mean, it was  
5 on the same level playing field as yours,  
6 though. You see, you had 100 workers.

7 DR. NETON: Yes. Yes.

8 DR. MAURO: We could have grabbed  
9 100 also.

10 DR. NETON: Yes. Well, you're  
11 down --

12 DR. MAURO: And -- yes --

13 DR. NETON: -- less, but okay.

14 MR. MAKHIJANI: No, no. Wait a  
15 minute. We're comparing -- there are three  
16 different lines in this graph and two of them  
17 almost completely overlap, because --

18 DR. NETON: Maybe I'm not reading  
19 it properly.

20 MR. MAKHIJANI: -- because --  
21 illustrating that none but those 20 had any  
22 plutonium samples. The black line is all 100

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1 workers in Table 7-1.

2 DR. NETON: Right.

3 MR. MAKHIJANI: The blue line is  
4 the NIOSH radsafe in the Table 7-1, which was  
5 21 workers. And they overlap completely  
6 because almost no one else had any positive --  
7 you know, the --

8 DR. NETON: But the SC&A red line  
9 is 20 workers?

10 MR. MAKHIJANI: Twenty workers.  
11 So the blue line and the red line are  
12 comparing 20 workers to 21 workers. The  
13 object of this exercise is not to present  
14 something that could be useful for dose  
15 reconstruction --

16 DR. NETON: I understand.

17 MR. MAKHIJANI: -- but to show  
18 that a randomly selected group of 20 radsafe  
19 workers had at the right tail a significantly  
20 different set of plutonium bioassays, and  
21 tables have -- we went round this question  
22 from every -- there's not one angle from which

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1 we looked at Table 7-1 and this was just one  
2 of the angles. And every way we looked at it  
3 reinforced the same central conclusion that  
4 that's not the right set.

5 MR. ROLFES: What this says to me  
6 is that if you add additional workers, it's  
7 going to drop down the internal doses that  
8 NIOSH assigns. By adding additional workers  
9 with internal exposures, it's going to drop.  
10 Is that not --

11 MR. MAKHIJANI: I think you're not  
12 getting the central point. There are a couple  
13 of central points. One is, if you look at  
14 your evaluation report, one piece I read out,  
15 the other piece, you say that radsafe workers  
16 are among the most highly exposed and  
17 therefore you can use those.

18 Now if you could establish that, I  
19 think you could have a data set that would be  
20 useful for a coworker model. From what we  
21 could look at, there's almost no useful data  
22 for other worker groups, so you can't

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1 establish that. And so adding workers or  
2 adding radSAFE workers doesn't actually  
3 relieve that problem.

4 DR. NETON: Let's cut to the chase  
5 here, I guess. The fact is when you're  
6 dealing with sparse data, you know, a lot  
7 things can pop up, right? I mean, you pull  
8 20, we pull 20, you're going to get different  
9 distributions. And so I'll grant you that.  
10 And I think that we're willing to concede the  
11 fact that the data are fairly sparse and could  
12 be fleshed out in more detail. I think that's  
13 our position right now. And so if we need to  
14 go back, collect more data, we're prepared to  
15 do that.

16 DR. MAURO: You know, there's  
17 agreement around the table that that group of  
18 100 that you currently have as the basis for  
19 your coworker model is right now not  
20 adequately supported --

21 DR. NETON: Well, it -- yes,  
22 it's --

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1 DR. MAURO: -- and more work needs  
2 to be done to see in fact there are more data  
3 out there, better data, more complete that  
4 provides the assurance, then we're in  
5 agreement.

6 DR. NETON: Notwithstanding, I  
7 challenge some of the analyses that were done,  
8 and we have admittedly, but I think we're  
9 prepared to say that, you know, we based this  
10 on some sparse data, we need to flesh it out  
11 some more to be more convincing this is an  
12 appropriate value, or to substitute something  
13 else more. I think Mark might have had  
14 something to say as a --

15 MEMBER GRIFFON: I am debating  
16 whether to say it. I'm sorry. I'm debating  
17 whether to say it out loud. I mean, I just --

18 DR. NETON: I'd like to hear your  
19 opinions.

20 MEMBER GRIFFON: I heard Mark a  
21 couple times say "pursuing more data," and  
22 then that there is no coworker model yet. I'm

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1 just a little -- I mean, I'm not in this work  
2 group, so I haven't been following it, I mean,  
3 is the work group model being developed from  
4 a database set of data, or are you pulling it  
5 from all the claims files, or --

6 DR. NETON: Well, originally it  
7 was developed from the 100, these radsafe  
8 workers who were --

9 MEMBER GRIFFON: So you took raw  
10 data out of their file and sort of assembled  
11 it?

12 DR. NETON: Right. It was a  
13 coworker model based on claimant data, not  
14 unlike what we proposed to do with Savannah  
15 River now where we would use the entire  
16 claimant population. In retrospect that might  
17 have been a better approach for us to pursue  
18 here.

19 MR. ROLFES: I think that's  
20 probably our next step would be to do that.

21 MEMBER GRIFFON: But when you --  
22 you seem to suggest that there's some

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1 additional data --

2 MR. ROLFES: That's another --

3 MEMBER GRIFFON: -- out there,  
4 too.

5 MR. ROLFES: Yes --

6 MEMBER GRIFFON: Okay.

7 MR. ROLFES: -- there are  
8 certainly are additional data at DOE Nevada  
9 that could be pursued.

10 MEMBER GRIFFON: So you know it  
11 exists and you know what they are --

12 MR. ROLFES: Yes.

13 MEMBER GRIFFON: -- you just can't  
14 get them yet? Is that what --

15 MR. ROLFES: Yes. The old system  
16 -- there's a couple of different databases  
17 that we spoke with some people from DOE Nevada  
18 about and it would take quite a bit of effort  
19 to find information in the database, then go  
20 recover microfilms and scan those and add  
21 those. So we're waiting to hear back from DOE  
22 Nevada on the availability of additional data.

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1                   MEMBER GRIFFON: That raises  
2 another question I have been asking people on  
3 the side, which is that, you know, I have that  
4 database, I think. It might not be the same  
5 one, but I have it from my research. And we  
6 also have microfiche. Boston University that  
7 has all the microfiche, but, you know, we  
8 did --

9                   MR. ROLFES: Great.

10                  MEMBER GRIFFON: It does exist,  
11 yes. It may not be the exact same set, but it  
12 does exist.

13                  MR. ROLFES: We'd like to see that,  
14 I think.

15                  DR. NETON: Could you provide a  
16 sense, Mark, of what the possible amount of  
17 data is that's out there, because I've been  
18 led to believe that it could be fairly  
19 substantial. We're not talking about a couple  
20 hundred workers here.

21                  MR. ROLFES: Yes, let's see. I  
22 don't know -- Billy, are you on the phone?

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1 MR. SMITH: Yes, I am.

2 MR. ROLFES: I know you've been  
3 working quite a bit and speaking about the  
4 availability of that data. I know you've been  
5 making several trips there as well and you've  
6 reviewed it firsthand. It's been a while  
7 since I've been there and spoken with anyone.  
8 Could you please give us an idea of the  
9 availability of the additional data from what  
10 we've heard in our discussions with DOE  
11 Nevada?

12 MR. SMITH: Well, I really can't  
13 tell you about the availability of it, but in  
14 terms of the volume of the data that's there,  
15 it has to deal with the --

16 MR. KATZ: I'm sorry, can you  
17 speak up, Billy, please?

18 MR. SMITH: I am. Can you hear  
19 me?

20 MR. KATZ: Yes, that's perfect.

21 CHAIRMAN PRESLEY: Thank you,  
22 Bill.

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1                   MR. SMITH: Okay. I really can't  
2 speak to the availability of it, but the  
3 volume of the data is enormous. As a matter  
4 of fact, there were tens of thousands of  
5 bioassay samples or results that are in the  
6 database that indicate that people were  
7 sampled. I think one of the flaws and  
8 fallacies of the SC&A analysis is that the  
9 results that they found have to do with only  
10 the bioassays that were positive, that were  
11 above the detection limit and they did not  
12 consider at all all of the negative results.

13                   MR. MAKHIJANI: No, this is not  
14 correct. No, we compiled all the data that  
15 was there.

16                   MR. SMITH: All of the data that  
17 was there. I mean, from --

18                   MR. MAKHIJANI: In the raw data  
19 handwritten files.

20                   DR. NETON: I think I can clarify.  
21 I think there's some concern or some lack of  
22 knowledge as to whether non-detectible

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1 bioassay results were actually entered into  
2 the workers' records. I mean, we have some  
3 here --

4 MR. MAKHIJANI: Well, that's a  
5 different problem than what SC&A did.

6 DR. NETON: No, no. That's what  
7 I'm trying to clarify. I don't think it's  
8 anything that SC&A did.

9 MR. MAKHIJANI: Right. Thank you.

10 DR. NETON: I think it's the fact  
11 that there may be a lot of records out there  
12 that are non-detectible and did not show up in  
13 the workers' records. And we need to get to  
14 the bottom of that. Because we still believe  
15 it's a fairly lose dose potential across much  
16 of this site with the exception of some of  
17 these activities that we talked about, these  
18 unique operations that exist from time-to-  
19 time.

20 MEMBER GRIFFON: Just for Bill on  
21 the phone, do you know, does it have a  
22 database name or is there any other

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1 descriptors? I'm curious if what I was  
2 working with is the same database. I'm not  
3 sure even --

4 MR. SMITH: Well, are you talking  
5 about the database that was sent back to  
6 University of Boston?

7 MEMBER GRIFFON: Yes.

8 MR. SMITH: It went back to Boston  
9 a few years back? Yes, that's a subset of the  
10 database in Nevada.

11 MEMBER GRIFFON: A subset? Oh, I  
12 see. Okay.

13 DR. NETON: And, I think we have  
14 to determine what type of subset that is.

15 MEMBER GRIFFON: Yes, I think the  
16 subset that Boston University got was because  
17 they were working under CPWR, so it was only  
18 the -- I think they queried the construction  
19 workers. Tunnel workers were in there, I know  
20 that.

21 MR. ROLFES: Specifically as to  
22 your question, Mark, the 1955 to 1963 database

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1 was called dead bio.

2 PARTICIPANT: That's the same one.

3 MR. ROLFES: Okay. And then there  
4 is another database that points to the actual  
5 documents that are maintained on microfilm.  
6 The other database begins in 1964 and goes  
7 forward, and contains personnel identifiers  
8 such as the NTS member, the Social Security  
9 number and others. And the point of all that  
10 is that if a bioassay sample was not above the  
11 detection limit, it was not entered into the  
12 worker's dosimetry file. So what is in the  
13 worker's dosimetry file are the positives  
14 above detection limit. And it doesn't mean  
15 that there are no data there. In fact, it  
16 appears that there is a wealth of data and  
17 it's going to substantiate the very low  
18 coworker model.

19 DR. NETON: I mean, at the end of  
20 the day I think radsafe model is probably  
21 going to be higher than what we come with.

22 MEMBER GRIFFON: I mean, going by

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1 memory, I know there was a large percentage of  
2 non-detects or whatever in all these data  
3 sets. But there was like -- and it sounds  
4 like the same one, but there was dead bio was  
5 '55 through '63 and then a mid bio. I think  
6 there were a number of these tables. You  
7 probably have the same exact -- sounds like  
8 the subset went to the Boston University.

9 CHAIRMAN PRESLEY: Hey, Billy?

10 MR. SMITH: Yes?

11 CHAIRMAN PRESLEY: This is Bob  
12 Presley. You going to be on here for a little  
13 while?

14 MR. SMITH: I'll be here all day.

15 CHAIRMAN PRESLEY: Okay. Good.  
16 I've got this old man syndrome and I'm getting  
17 ready to call a 10-minute break.

18 MR. SMITH: Okay.

19 CHAIRMAN PRESLEY: And we will  
20 come back at 10 minutes after 11:00. And one  
21 of the things that I would like to discuss is  
22 everybody says, well, we need new samples.

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1 Let's go. Let's Gene and you and I come up  
2 with a list of people that will be potentially  
3 some of the highest -- people with the  
4 potential highest radiation dose.

5 MR. FUNK: Bob, can I inject  
6 something here at this juncture? Of all the  
7 tests that were conducted at Nevada Test Site  
8 that were underground, such as -- excuse me,  
9 I'd like to rephrase that. Of all the tests  
10 that were conducted in the tunnels and the  
11 mine shafts where miners took part, where  
12 bioassay was done, is less than one percent of  
13 all the tests that were done on the site.  
14 There was no bioassay for the Flats workers  
15 per se in the drilled shafts.

16 And I'd like to make another  
17 point. There was no -- the holes were not  
18 secured after the test was conducted. There  
19 was no longer any need for security to be  
20 there.

21 And another point, we were on  
22 theses sites where the test was carried out

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1 for as long as two weeks before the so-called  
2 state of the art radsafe system was brought in  
3 where they put a fence around the reentry  
4 drill and where controlled access was done.  
5 And the controlled access was not done by  
6 Wackenhut. It was done by the radsafe  
7 personnel themselves. And these points needs  
8 to be addressed. And we're back to that table  
9 that has by name and date. We still have not  
10 identified which of them shafts were mine  
11 shafts which would have had bioassay and PICs  
12 and the shafts that were drilled shafts which  
13 did not have -- that type of monitor you're  
14 talking about.

15 CHAIRMAN PRESLEY: John, this is  
16 Bob. We're going to talk about that after the  
17 break. We're going to try to come up with a  
18 good list of people that we think might have  
19 the highest potential dose. Okay?

20 MR. FUNK: Can I help you?

21 CHAIRMAN PRESLEY: We will let you  
22 have your say.

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1 MR. KATZ: Thank you, John.

2 So we're just going to put the  
3 phone on mute for about 10 minutes here, but  
4 we're not breaking the line.

5 (Whereupon, the proceedings went  
6 off the record at 10:57 a.m. and  
7 resumed at 11:23 a.m.)

8 MR. KATZ: This is the Advisory  
9 Board on Radiation Worker Health, the NTS  
10 Working Group and we're reconvening after a  
11 break.

12 And I just want to say something  
13 to John Funk.

14 John, are you with us on the line,  
15 before we get started?

16 MR. FUNK: Yes, I am.

17 MR. KATZ: Hi. Listen, my guess  
18 is that the Working Group is not going to go  
19 all day, that it's going to get done with  
20 reasonable time to spare.

21 And so, John, if you would just  
22 keep track, I mean, you've already raised some

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1 issues and some things have been discussed,  
2 but, you know, no doubt you might have some  
3 issues at the end of all the discussion that  
4 you feel haven't been addressed that you would  
5 like to ask questions about and get responses  
6 from the Working Group. So if you would just  
7 keep track as this discussion goes on of which  
8 of your issues have been addressed but which  
9 more importantly haven't been addressed that  
10 you'd like to raise, then at the end of when  
11 the Working Group has gotten through all of  
12 its discussions, any of those outstanding  
13 issues, you know, if you would within five to  
14 ten minutes just raise those issues in as  
15 clear a fashion as you can one-by-one, and  
16 then the Working Group, some of the  
17 individuals from SC&A and the Working Group  
18 and so on can try to respond to those, if  
19 you'd like that opportunity.

20 MR. FUNK: That's perfectly  
21 acceptable to me. Unfortunately, I didn't  
22 have time enough to get this report into you

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1 because I didn't receive any paperwork myself.  
2 So that's what's kind of messed this thing up.  
3 I wasn't aware of the time that I would have.  
4 So I'm sorry about this, but there has been  
5 quite a bit of injections of misinformation  
6 that I feel is kind of unfair because I didn't  
7 have participation in the process from the  
8 beginning.

9 MR. KATZ: Well, John, I mean, the  
10 Working Group normally, you know, has lots of  
11 dialogue and it's not just a completely open  
12 forum. But anyway, if you would just keep  
13 track of issues that you would like to raise  
14 questions about at the end based on the  
15 discussion that happens today or issues that  
16 you have from previously, then that would be  
17 great. We will hear those and people will  
18 take a crack at answering some of these  
19 questions for you.

20 MR. FUNK: That's fine with me.

21 MR. KATZ: Thank you, John.

22 CHAIRMAN PRESLEY: This is Bob

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1 Presley. What I'm hearing, let me recap, is  
2 that we, the Working Group, and the Working  
3 Group chime in and tell me if I'm not correct,  
4 but I believe that we need to go back and try  
5 to identify some more people or job categories  
6 that NIOSH or CDC needs to look at to see if  
7 there are other groups of workers at the test  
8 site that might have either the potential or  
9 have a higher dose than some of these first  
10 100 that we looked at. Is that not true?

11 MR. ROLFES: Well, what I think we  
12 committed to do was certainly obtain  
13 additional bioassay data. And I guess there's  
14 a couple of different sources. We already  
15 have bioassay data for all the claimants that  
16 we -- well, I shouldn't say all of the  
17 claimants. But every time we have a claim  
18 that comes to NIOSH for a dose reconstruction,  
19 we receive a response from the Department of  
20 Energy. And if there are bioassay data  
21 available for that individual, they are  
22 provided at that time. So that's one of our

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1 first sources of data that we already have.  
2 There are additional bioassay data that exist  
3 that we do not yet have. And I think we've  
4 committed to looking into the other bioassay  
5 data to check on the quantities, the  
6 availability of those data, but we're also  
7 going to consider what we already have as  
8 well.

9 CHAIRMAN PRESLEY: Okay. Billy,  
10 you on?

11 MR. SMITH: Yes, I'm here.

12 CHAIRMAN PRESLEY: Okay. Gene and  
13 you and I, and see if I'm correct on this, I  
14 think that some of the higher potential dose  
15 rate would come from the people doing the  
16 drill-back and the receiving of the drill-back  
17 samples post-shot. Is that correct?

18 MR. SMITH: I can't confirm that  
19 those people would be the highest exposed  
20 people, but the source terms were there when  
21 they would recover core from the drill-backs  
22 and the people who operated the core shoe and

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1 of course a radiation monitor was present at  
2 the particular time that the cores were being  
3 pulled and put into the containers for  
4 shipment back to the laboratories.

5 CHAIRMAN PRESLEY: That's correct.

6 MR. ROLFES: Now, as I understand  
7 as well, the people that would have been  
8 involved in taking custody of the core would  
9 have been from a laboratory, like the design  
10 laboratory at Livermore or Los Alamos and not  
11 necessarily NTS employees.

12 MR. SMITH: That's true.

13 CHAIRMAN PRESLEY: That's correct.

14 And that would probably put a little bit of  
15 burden on whoever's going to go back and try  
16 to identify these people. But that is one  
17 group that I feel like has the potential.

18 The second group that I feel like  
19 that might have a higher potential would be  
20 the reentry teams that immediately went into  
21 the tunnels after the tunnel shots. Now take  
22 into mind that the people that went in there

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1 were going in after the air was cleared. It's  
2 my understanding that as soon as we had the  
3 tunnel shot that the air was evacuated from  
4 the tunnel to try to get the gases out before  
5 these people went in. And if it's possible,  
6 we could identify some people that might have  
7 gone in where we did have a breach or a blow-  
8 back. That's possible that we could identify  
9 those people that would have been involved in  
10 that type of an operation.

11 The other potential would be the  
12 people that would have gone into the Plutonium  
13 Valley to go in and pick up samples at later  
14 dates.

15 What do you think, Billy?

16 MR. SMITH: Well, I don't think  
17 that the plutonium -- or whatever, it's not a  
18 lot of activity in Plutonium Valley. For  
19 those areas that were posted, no work really  
20 took place in those particular areas, so there  
21 was no samples to go back in and pick up.

22 CHAIRMAN PRESLEY: Okay.

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1                   MR. SMITH: The reentry teams are  
2 well-identified and we know exactly who the  
3 names of the individuals are that made the  
4 reentries, both for tunnels and for flat  
5 shots. And the log books indicate who those  
6 individuals are and of course by name, you  
7 know, so it is possible to go in and look at  
8 whatever dosimetry or bioassay information  
9 that would have been collected from them.

10                   Now, the fact that a person made a  
11 reentry does not necessarily mean that a  
12 bioassay sample was collected. If there was  
13 a potential for a person to get an internal  
14 update, then a bioassay sample would have been  
15 taken. The fact that the guy was a radiation  
16 monitor on the team, he was already on the  
17 routine bioassay list. So he would have been  
18 getting a routine bioassay sample.

19                   If there was an incident that  
20 involved the release of radioactive material  
21 where intake was possible, then people that  
22 were associated with that reentry team would

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1 have been sampled. But now remember, all of  
2 the people that went back in on these  
3 particular tunnel reentries were in  
4 respirators of one kind or the other, either  
5 in self-contained respirators or as the time  
6 got later on, they might have gone to full-  
7 face respirators. But the potential for  
8 internal intake was very, very small.

9 CHAIRMAN PRESLEY: I agree.

10 Gene, do you have any comment on  
11 these areas, or do you have other areas where  
12 we might look?

13 Or, Billy, you too. If you've got  
14 any other areas that you feel like would have  
15 a higher potential for exposure to the  
16 workers.

17 Go ahead, Gene.

18 DR. ANSPAUGH: I wanted to make  
19 one comment about reentries. As you know,  
20 there were several different types of  
21 reentries that went on, and the very earliest  
22 one was sort of a survey for damage. And on

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1 occasion I believe that the ventilation  
2 systems were damaged to the extent that some  
3 of the craftspeople had to go in and fix the  
4 ventilation system before it could be  
5 operated. And of course it's good to remember  
6 that the first concern with the reentry was  
7 explosive gases. And so there was no  
8 opportunity to be running air samples to look  
9 for radioiodine at that early reentry stage.

10 MR. ROLFES: True. True. But  
11 also keep in mind that because there are  
12 explosive and toxic gases in those tunnels  
13 that the individual would have had to have  
14 conducted a reentry using SCBA, self-contained  
15 breathing apparatus.

16 DR. MAURO: We're doing something  
17 now that I think is very important that I  
18 don't even recall every doing before. That  
19 is, not saying let's go and sample bioassay  
20 data and see what we have. We're saying  
21 something different. Let's visualize what  
22 took place at this site. All the different

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1 types of reentries, different locations,  
2 different kinds of job categories and we'll  
3 say, listen, we're starting to get a  
4 sensibility of what scenarios, what work  
5 activities took place before, during and after  
6 a test where we could envision people could  
7 have experienced internal exposure. And I  
8 really thank you for this, Bob.

9           Then we ask the question, okay,  
10 given that sensibility, we're going to want to  
11 see if we can find bioassay samples for these  
12 people because we think these are the people  
13 that probably were the ones that had the  
14 exposures. We're approaching it in a  
15 different way. And if we can't find data for  
16 those people, we have to ask ourselves the  
17 question, or ask the record a question, why is  
18 it that these people that we thought on first  
19 principle should have been bioassayed, but  
20 weren't? And if we define the reason for  
21 that, great.

22           But if we can't find the reason

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1 for that, it goes to the heart of what John's  
2 talking about. An awful lot of workers that  
3 were doing things and being exposed and were  
4 a potential for internal exposure where they  
5 weren't bioassayed for whatever reason. And  
6 that's my main concern. That's the main thing  
7 that came out of our work. That is, it seems  
8 to me there's an awful lot of categories of  
9 workers, especially out at the Flats, where  
10 bioassay samples weren't collected and  
11 perhaps, based on the discussions we heard  
12 from Lynn, perhaps they should have been  
13 bioassayed. And I think what you just  
14 described is exactly what needs to be done.

15 MR. ROLFES: John, I think on the  
16 break we were discussing a little bit about  
17 the -- I've got an example of a flat shot that  
18 was conducted at Nevada Test Site and there  
19 were additional reentries following, you know,  
20 an initial radiologically controlled --  
21 however, there were also subsequent reentries  
22 when the area was declared as a non-

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1 contaminated area. Basically, it was released  
2 from radiation safety and the people were not  
3 needed to participate in a bioassay program  
4 because there was no potential for intake.

5 We have swipe data. We have  
6 indications that really there was no internal  
7 intake potential. We've got, for example,  
8 this particular shot. We've got radiation  
9 dose rate readings and also swipe data. There  
10 were some people that did reenter into a  
11 containment area. There's also swipes inside  
12 of that containment area. There's also  
13 personnel contamination swipes to determine  
14 whether there was any contamination on those  
15 individuals. There was no contamination in  
16 this particular incident and if there was  
17 contamination on a person, that would indicate  
18 that that individual needed to provide a  
19 bioassay sample. If there's no contamination  
20 on an individual, it's very, very unlikely  
21 that they would have any intake potential.

22 DR. MAURO: So the point you're

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1 making is that when we go through this  
2 exercise and we find certain people who my  
3 first thought was that, gee, we would have  
4 thought they might have been bioassayed  
5 because of what they did.

6 MR. ROLFES: Sure.

7 DR. MAURO: But you're saying  
8 that, no, but there's a record here that shows  
9 after that incident, that day, whatever it  
10 was, there were steps taken to take air  
11 samples or swipe samples, or do scan surveys  
12 that would indicate there was no potential.  
13 And the evidence being that the judgment not  
14 to take the bioassay sample for that person on  
15 that day is established and there's a record.  
16 And that would be the case that has to be  
17 made. Right now all we know is that we had  
18 all these people that worked at all these jobs  
19 and they weren't bioassayed. And but you're  
20 saying there might be good reason for it and  
21 there's a record for that, the reasons.

22 MR. ROLFES: Very true.

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1 DR. MAURO: And now the story  
2 starts to unfold in a way that we can deal  
3 with it.

4 MR. SMITH: This is Billy. One of  
5 the things that you have to remember is that  
6 any time there was an event executed at the  
7 test site and after the reentries occurred, a  
8 controlled area was established around that  
9 area and that controlled area was really the  
10 area in which people were logged in and out of  
11 the area for radiological control purposes.  
12 They could have been issued PICs when they  
13 went in and came out, or they wore anti-Cs and  
14 they had the PPE that they needed to have to  
15 work in that particular area. People were not  
16 bioassayed at NTS based on job category, and  
17 that's a premise that you guys have made,  
18 John, that's absolutely wrong. So if you want  
19 to look at the bioassay sample from a  
20 particular carpenter group or a particular  
21 welding group, or a particular operating  
22 engineering group, you're not going to find

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1 that that's the way bioassay sampling  
2 occurred.

3 Because of the very, very low  
4 potential of internal intakes at NTS, people  
5 were bioassay sampled based on need and if  
6 there was a particular incident that required  
7 them to be bioassay sampled.

8 MEMBER CLAWSON: So, Billy, this  
9 is Brad, you're telling me that NTS is so good  
10 at telling where contamination and everything  
11 else is at that they have done all these  
12 people by their requirements for that.  
13 Because if you are, I'm pretty excited about  
14 it. But I haven't seen it any place else. I  
15 know an awful lot of people, an awful lot of  
16 people that get into a lot of issues. And  
17 when you go into these reentries and you start  
18 breaking apart things that haven't been swiped  
19 and everything else like that, you have a very  
20 good risk of uptake. And you know as well as  
21 I do that they've had to go into many of these  
22 tunnels, put up lead, they've had to paint the

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1 walls and everything else like that to be able  
2 to do this. So if they're not monitored,  
3 there's good potential for them to still get  
4 internal contamination.

5 MR. SMITH: Well, the radiation  
6 monitors would have been present. There was  
7 no activity that occurred in a radiological  
8 area at NTS where radiation monitors were not  
9 present.

10 MR. ROLFES: That's correct.

11 MEMBER CLAWSON: In theory --

12 MR. SMITH: No, not in theory. In  
13 practice. There was no radiological work  
14 going on at NTS where radiation monitors and  
15 RCTs were not present monitoring the workers  
16 to make sure that they were not exposed,  
17 either externally or internally to radioactive  
18 materials.

19 MR. ROLFES: I can read from an  
20 example of an event. After a shot was  
21 conducted, the very first thing, the very  
22 first -- two words: 'industrial hygiene' --

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1 two industrial hygiene personnel checked the  
2 air to determine whether there were any  
3 explosive or toxic gases. So radiation dose  
4 rate readings and also swipes. They found no  
5 contamination for this specific -- and they  
6 were in Scott air packs. So they had  
7 protection equipment to do this initial  
8 reentry to determine whether there was any  
9 intake potential or high exposure rates. I  
10 mean, it is documented for each test and this  
11 is just an example.

12 For each time that individuals are  
13 going into the area, there is documentation of  
14 the contamination levels and dose rates that  
15 the workers were subject to.

16 There's also indicators whether or  
17 not there were any personnel being  
18 contaminated. There's indications that there  
19 was no contamination detected on personnel on  
20 this particular day. Now if there was an  
21 indication that there was contamination on  
22 those individuals, then it would be something

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1 that would trigger the request for a bioassay  
2 sample.

3 MEMBER CLAWSON: How big were  
4 these tunnels, Mark?

5 MR. ROLFES: I am talking about on  
6 the Flats right now, so --

7 MEMBER CLAWSON: Okay. The Flats?  
8 Well, you know, let me explain something to  
9 you. In theory this all sounds wonderful. In  
10 theory I still can't do anything without  
11 radcon, but when you got one radcon and you've  
12 got 35 or 40 people doing work in one area,  
13 I'm sorry, you're not going to get it all and  
14 you're not going to be able to see everything  
15 that they're into. You've got people going  
16 every different direction. And this is what  
17 Mr. Funk has been bringing up so many times.  
18 It's not just so cut and dry. I keep hearing  
19 the comments of, we had radcon there, we had  
20 everything else. Well, read the RWPs very  
21 closely because it's just like with us,  
22 present. That doesn't mean they're there.

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1 MR. ROLFES: well, I'm just  
2 reading the reports as they stand and it says  
3 no contamination was detected on personnel.  
4 So unless there was -- I mean, you know, I'm  
5 just reading the data. I'm reporting the  
6 facts. That's all.

7 MEMBER SCHOFIELD: But that's for  
8 one shot.

9 MR. RICH: This is Bryce Rich.  
10 Could I make a couple comments based on some  
11 little experience at the site?

12 MR. KATZ: Yes, Bryce.

13 MR. RICH: There are a number of  
14 ways of operating and controlling, and quite  
15 frankly, before a shot was executed, of course  
16 there's an evacuation of the entire area back  
17 to a major control point. A forward control  
18 point was set up for initial immediate reentry  
19 to retrieve diagnostics from the trailers that  
20 were around the test shot. In the event of a  
21 venting -- and by the way, this was controlled  
22 by the test group director, which was a

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1 laboratory test group director, and we had a  
2 professional health physicist accompanying all  
3 of those initial reentry teams.

4 In the case of a venting, they  
5 wore appropriate respiratory equipment and  
6 sometimes it was, you know, a couple of miles  
7 to drive in order to get back to the trailer  
8 park. That was one area where potential  
9 exposure could occur. But there was somebody  
10 there with specific directions and  
11 responsibility for monitoring and detecting  
12 radiological materials and assuring if there  
13 was any potential for exposure, bioassay would  
14 be called for.

15 In the case after the subsidence,  
16 I think Lynn mentioned that occasionally, on  
17 rare occasions, I remember probably one where  
18 subsidence occurred after we were in the area  
19 or in the trailer park. It was extremely  
20 rare. We normally waited until the subsidence  
21 had occurred for safety reasons, because we  
22 didn't know exactly how far the subsidence

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1 would occur.

2 In Alaska, you know, the  
3 subsidence crater was a mile wide or so, and  
4 indeed our control point was in the -- it  
5 dropped a few feet in the periphery of the  
6 subsidence crater. But when we moved in the  
7 drill rigs for -- and all of this was for  
8 sample recovery, prompt time electronic data  
9 recovery on the instrument trailers. And then  
10 of course there's a drill-back to recover the  
11 samples of the melt.

12 That was again done under control  
13 of the laboratory people with support from the  
14 site support contractor, the radsafe. The  
15 drillers of course were drilling and during  
16 this sample recovery, which were very high and  
17 a high potential for primarily radiation.  
18 These were melt samples and as a consequence  
19 they wouldn't -- a lot of air activity  
20 emitted, but they were properly clothed and  
21 protected. And in the event that there was  
22 any indication of release of activity, there

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1 was bioassay samples taken.

2 Same thing was true with the  
3 tunnels. These were under the control, the  
4 initial reentries and particularly into areas  
5 where there was tunnel damage. And as Lynn  
6 mentioned, occasionally we'd have a vent line  
7 broken and indeed there was some high-hazard  
8 reentries where there's a possibility of  
9 explosive gases. And indeed, on rare  
10 occasions we had a detonation of gases in the  
11 tunnel. Happily, no one was injured from  
12 those, but there was a high level of safety  
13 and radiological safety, particularly  
14 awareness and if lines were available, the  
15 tunnel was ventilated prior to reentering.  
16 And those were vented through a stack with  
17 filtration on the effluent.

18 And the areas on the site,  
19 Plutonium Valley, for example, was roped off  
20 and it was -- most people were aware of that.  
21 Air sampling was taken on the periphery and so  
22 there was an environmental level of re-

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1 suspension activity there. So there's data  
2 associated with providing safety for the site  
3 workers. From just my own perspective, I just  
4 wanted to add those things.

5 MEMBER CLAWSON: Well, Bryce, and  
6 that's good, and I'm not saying that they  
7 weren't protected. But you know as well I do  
8 stuff happens. From your knowledge with the  
9 chem plant, I'm sure that you're familiar with  
10 the term "the chem plant shuffle," and what  
11 that was for.

12 MR. RICH: Of course. And but we  
13 were very, very conservative, too, Brad.

14 MEMBER CLAWSON: We were, but that  
15 chem plant shuffle was to get what was off of  
16 our feet because the contamination on the  
17 ground.

18 MR. RICH: I understand. And we  
19 dealt with contamination and moving from the  
20 plant, and we solved the problem. But the  
21 point was, it was not an unknown issue. It  
22 was a condition that we were aware of. And

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1 when we had contamination like that, we  
2 increased the level of bioassay sampling. The  
3 same thing happened at the test site. We  
4 don't have all of the data available to us  
5 now. A lot of data was taken that came out  
6 negative and my understanding from Billy was  
7 that they did not record in the same place the  
8 zero readings, but they are kept.

9 MR. SMITH: Brad, one other thing  
10 that I can add to what Bryce has already said,  
11 you know, once the reentries occurred and a  
12 control was established around a particular  
13 area, no, we did not have RCTs for every  
14 worker at the work site. But one of the other  
15 things we did, the layers of the radiological  
16 protection program, including air sampling --  
17 for instance, air sampling was established as  
18 early as we could get the air sample  
19 established, either with electrical power or  
20 through the gasoline pumps and drove the air  
21 samplers.

22 If a particular air sampler had

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1 shown that there was reasonable radioactive  
2 material suspended that the RCT had missed and  
3 after that air sample was counted, then an  
4 assessment would have been made as to whether  
5 or not the workers that had worked in that  
6 area had been potentially internally exposed.

7 So, you know, it was not a case  
8 where you decided that you needed to bioassay  
9 sample a person because of the work he was  
10 doing. It was because of what the radiation  
11 environment was in and around where all of the  
12 workers were working.

13 MR. RICH: And to reemphasize,  
14 Billy, there were certain classes of workers,  
15 however, that were on routine bioassay,  
16 specifically the radcon workers because they  
17 were at every site, every time.

18 CHAIRMAN PRESLEY: Okay. Gene,  
19 you got some? Lynn, I meant.

20 DR. ANSPAUGH: Well, I just wanted  
21 to comment that there 769 tests, and Mark was  
22 reading the results of one test. And if I

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1 wanted to pick a horror story, I could pick  
2 the results for shot Yuma for example, or shot  
3 Merlin. And shot Yuma was, I think, if we  
4 think of the example of how all these  
5 procedures failed in the -- we had workers  
6 working who should have been wearing  
7 respirators who were not and the air sample  
8 wasn't counted until hours after it was taken.  
9 The decision was made to evacuate the people,  
10 but they -- the miners were already self-  
11 evacuating because they were all sick from  
12 carbon monoxide poisoning. So there's a full  
13 spectrum from very good to very bad.

14 MR. ROLFES: That's true. We're  
15 not saying --

16 MR. RICH: Lynn, this is Bryce  
17 again. Could I just make a footnote comment  
18 to your comment? You are highlighting the  
19 unusual occurrence, the incident. And indeed  
20 the standard operating procedure is replaced  
21 by an emergency procedure during that time.  
22 And in those occasions, of course there was

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1 clear evidence and need for extensive bioassay  
2 sampling, which was done on every one of those  
3 shots, Lynn.

4 MR. ROLFES: That's correct,  
5 Bryce. I've seen a lot of the data. There's  
6 quite a bit of radioiodine data available for  
7 the individuals that participated in shot  
8 Yuma.

9 MEMBER CLAWSON: And, Bryce, I  
10 want to bring up something, too. Because you  
11 and Billy have been doing somewhat of the same  
12 thing. Unfortunately, we always look at one  
13 end of the spectrum and the other end of the  
14 spectrum. And I guess I'm trying to use a  
15 little bit of common sense. Everything was  
16 not always perfect there.

17 You have portrayed that everything  
18 was wonderful. And like Lynn said, he went  
19 clear to the other side. All I'm trying to  
20 bring to the point is is everything was not  
21 always wonderful down there and that there  
22 were mistakes that were made. And yes, that's

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1 how we've made the radcon program what it is  
2 and we're still making mistakes.

3           You were talking about sampling  
4 early on. It's also true that those samples,  
5 as soon as the dust started going, they  
6 started filling up the samples and they  
7 wouldn't pull any more. So they were doing  
8 pre-samples of those and then they'd shut them  
9 off when the guys started working. I can tell  
10 you right now that we've already found that  
11 that is an issue and with our radcon program  
12 it has to be done during our work because we  
13 stir up so much different stuff.

14           I'm not saying that Nevada Test  
15 Site did anything wrong. What I'm trying to  
16 say is that we need to look at this also very  
17 realistically. Everything was not perfect  
18 down there. And we both go to either side of  
19 this and I guess I'm kind of a half-full or  
20 half-empty, whatever you want you say, but  
21 things were not always perfect and we did miss  
22 stuff, and we did miss people.

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1                   MR. RICH: I have never indicated  
2                   that there wasn't things that happened out of  
3                   the ordinary and that everything was perfect.  
4                   Of course there was, otherwise we wouldn't  
5                   have employed hundreds and hundreds of radsafe  
6                   people and put the laboratory's -- put  
7                   professional staff down there. We had 15  
8                   radiological safety people in the department  
9                   that I was responsible for for a short period  
10                  of time. And of course that's the reason why,  
11                  because these were not usual testings. They  
12                  were prone to -- that's why we conducted the  
13                  test to see what would happen. So it was R&D  
14                  of the highest hazard kind.

15                  We understood that and indeed  
16                  things happened. But my point was that when  
17                  you establish a routine program, it is  
18                  designed to provide coverage for an operation  
19                  that is not changing radically. When you  
20                  conduct a test, things happen.

21                  And all I'm saying is that there  
22                  was a radiological protection program and

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1 could we have missed something? Of course we  
2 could have missed something, as you could miss  
3 something anywhere. But the effort was by  
4 looking at the total overall monitoring  
5 experience at the site, you can draw some very  
6 clear conclusions about the fact that you were  
7 looking at people with the highest potential  
8 exposure. And if you're concerned about any  
9 other individual, we always tried in this  
10 program to default to the high side and to  
11 provide the mechanism, the data to provide a  
12 dose reconstruction that is very claimant-  
13 favorable.

14 And so I'm not proposing, Brad,  
15 that everything was perfect. Of course it  
16 wasn't. But there was an awful lot of money  
17 and effort and dedication put into running a  
18 program that would provide every bit of safety  
19 that we possibly could to the worker and the  
20 plant population.

21 DR. NETON: I think this is all  
22 very good interesting discussion about the

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1 historical perspective of what the monitoring  
2 programs looked like. But I think that the  
3 real issue at hand then is can NIOSH find  
4 sufficient documentation that the programs  
5 were as robust as portrayed here, and right  
6 now we're in the process of trying to  
7 determine how we're going to do that. And I  
8 think we've proposed a path forward to go look  
9 at this bioassay database that exists out  
10 there. And I think we're still interested in  
11 hearing some guidance from the Working Group  
12 and others as to which particular classes of  
13 workers might be of relevance or of interest  
14 for us to pursue.

15 MEMBER CLAWSON: And I guess  
16 that's part of my question. Are we looking at  
17 just the reentry teams into the drill shots or  
18 the tunnels, or everything?

19 CHAIRMAN PRESLEY: Everything.  
20 Because this is just an outline of where the  
21 potential might be. So you're looking at what  
22 went on. All the groups go into those things.

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1                   MEMBER CLAWSON: Well, the reason  
2 I'm saying that is because the tunnels, it was  
3 interesting to me because when they called  
4 them "tunnel workers," we had everything from  
5 electricians, we had mechanics, we have almost  
6 everything in there. And it was interesting  
7 to me to see that they were classified a lot  
8 of times as tunnel workers. And as I've heard  
9 from some of the petitioners and so forth,  
10 they moved in and out of that numerous times.  
11 And this is what I want to be able to -- what  
12 I'm looking at is because a lot of times when  
13 they went back into those tunnels, yes radcon  
14 went in there, but a lot of times they had to  
15 put the ventilation systems back together.  
16 They had to put wiring systems in there.  
17 Mechanics have to shore up or whoever went in  
18 there to shore the rocks back up and stuff.  
19 And I want to make sure that we get the right  
20 mix that we did. I know that we've looked at  
21 radsafe, but I want to look at some of the  
22 other ones, maybe even electricians and stuff.

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1           But part of the issue, and this is  
2 what it gets into, they went in and out. If  
3 they were short electricians, they could pull  
4 them in from their central area and be able to  
5 use them on that. And if they gained  
6 manpower, they got the manpower. So this is  
7 what I was just suggesting.

8           DR. MAURO: And I'd like to  
9 remind, one of the first points that were made  
10 is that the tunnels is not where the action  
11 is. Only a small percentage of the tests took  
12 place in tunnels. Most of them were in bore  
13 holes and shafts. And I think that if we're  
14 going to go look for places -- I mean, you  
15 know, we've been looking at the tunnels and  
16 looking at the records that have emerged, and  
17 that's where the 100 fundamentally came from.

18           It's almost like a change of --  
19 let's think about this a little differently.  
20 Since over 90 percent of the tests took place  
21 in the Flats, and it sounded like a lot of the  
22 releases took place in the Flats, that's the

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1 place we should be saying, okay, where are the  
2 people, where are the scenarios where we're  
3 sure -- would like to be sure that if there  
4 were no bioassay samples taken from those  
5 workers that participated in those tests, it  
6 was good reason for it. My main concern is  
7 that if we just look at the bioassay data  
8 without mapping it back onto the scenarios and  
9 settings, especially in the Flats, we're going  
10 to come back here and again and we're going to  
11 be right back where we started. So I just  
12 want to remind everybody of that.

13 MR. SMITH: Brad, this is Billy.

14 MEMBER CLAWSON: Hey, Billy.

15 MR. SMITH: I'd like to comment.

16 I agree with you that, you know, the term  
17 "tunnel worker" is a generic term. That's a  
18 term just simply applied to people who work in  
19 and out of the tunnels. The job categories  
20 covered the whole spectra of construction and  
21 maintenance worker categories. And those  
22 people who worked on a particular crew, if

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1 they were short and they needed some other  
2 people, they would get other craftsmen in to  
3 support the work activities that went on in  
4 the tunnels, as compared to people who worked  
5 in the Flats. Now there were drillers and  
6 there were miners. All right. Drillers  
7 primarily worked in the Flats drilling the  
8 vertical shafts and the vertical holes. The  
9 miners did the mining up in Area 12, 15, 16  
10 and 20 Areas. Those were just categories of  
11 workers based on the kinds of jobs that they  
12 did.

13 And the kind of protection  
14 programs that went on to look at workers by  
15 DOE was to protect all of these people doing  
16 whatever they were doing with an adequate  
17 radiological protection program, a layered  
18 radiological protection program which included  
19 a variety of people with dosimeters,  
20 collecting air samples, putting out  
21 environmental surveillance networks, and also  
22 looking at the activities that were going on

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1 that were associated with creating  
2 contamination, if you will.

3 I would suspect that, you know,  
4 with the kind of work that I know that Lynn  
5 did at the test site in Area 3, in Area 5, in  
6 Area 9, the "Plutonium Valley" areas, if  
7 you're familiar is true, then you are sitting  
8 there looking at the person with the highest  
9 potential internal exposures. Lynn worked in  
10 that area. That's what he did.

11 DR. ANSPAUGH: Thank you, Billy,  
12 but I'd remind you I never had a bioassay.

13 MR. SMITH: And that's indicative  
14 of how good the program was. You didn't  
15 need --

16 MEMBER CLAWSON: Billy, that's a  
17 loaded one there, but let's get back to the  
18 issue at hand. Here's one of my things. If  
19 we're looking at the Flats and everything else  
20 like that, what sorts of people would we have  
21 in there? Because I know when they came in to  
22 take the trailers out and everything else like

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1 that, we had operating engineers in there.  
2 Was it the electricians that were cutting the  
3 wires that went down to the test, or was it  
4 the instrument people? What kind of people  
5 would be looking for?

6 MR. SMITH: There were all types  
7 of craftsmen in. I mean, there were  
8 electricians, there were teamsters, there were  
9 operating engineers.

10 MR. RICH: Some of everything.

11 CHAIRMAN PRESLEY: I agree. And,  
12 Billy, you brought up a subject about drilling  
13 in the Flats. And John has brought up a  
14 subject about miners that worked in the Flats.  
15 This gives me a chance to clear something up,  
16 and you all stop me if I'm wrong. We did have  
17 shafts in the Flats where we used miners. And  
18 what we did is we drilled a shaft first and  
19 then the miners went down and they made large  
20 rooms and tunnels at the ends of these shafts.  
21 And so, yes, we did use miners in the Flats,  
22 but at that time the miners that would have

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1 done the work in the Flats would have been  
2 pre-shot-type people.

3 MR. RICH: Bob, this is Bryce.  
4 Just a little additional clarification.

5 CHAIRMAN PRESLEY: All right.

6 MR. RICH: When the access to  
7 below ground in the Flats was done with the  
8 standard mining drift, it was dug out rather  
9 than drilling.

10 CHAIRMAN PRESLEY: Right.

11 MR. RICH: Sometimes on a number  
12 of occasions, you're right, we drilled and  
13 cased a large casing and then the miners went  
14 down and cut and excavated underground from  
15 that casing. But there were instances where  
16 the miners would have sunk the shaft that  
17 provided the access to underground.

18 CHAIRMAN PRESLEY: Okay. Thank  
19 you. The only thing, I'd already written down  
20 in a case shaft to the rooms downstairs.

21 MR. SMITH: You know, the biggest  
22 example of that one would be Area 15, pile

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1 driver.

2 CHAIRMAN PRESLEY: Right.

3 MR. SMITH: There was a 1,500-foot  
4 vertical shaft drilled down and then it was  
5 mined out another 1,200 feet to create rooms  
6 for the experimental chambers.

7 MR. RICH: We had some of both on  
8 Alva and an number of other shots, so --

9 CHAIRMAN PRESLEY: Okay. All  
10 right. Path forward: NIOSH is going to go  
11 back and look for persons with potential  
12 higher doses, flats workers potentially.

13 MR. ROLFES: Well, I think the  
14 bottom line is we're going to pursue  
15 additional bioassay data regardless of where  
16 the individual worked. There's certainly  
17 going to be bioassay data available for flats  
18 workers that were participating in drill-backs  
19 and working with radiative materials where  
20 there was a contamination potential. And I  
21 think that's the bottom line.

22 DR. MAURO: Yes, I like almost a

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1 test -- right now what we're saying is there's  
2 two ways to come out of this problem. We  
3 could start with describing people, scenarios,  
4 events, situations, locations where people who  
5 really know the site, like Lynn and many of  
6 the folks around here or on the phone, is  
7 start to identify people and events tests  
8 where you intuitively would say there was a  
9 very real potential here. And I'm mainly  
10 talking now in the Flats with the bore holes  
11 and the shafts where there was very real  
12 potential for internal exposure. While that's  
13 going on, okay, creating this picture,  
14 independent of that you have a crew that's  
15 downloading the universal bioassay data that's  
16 out there. Okay?

17 And then you say, okay, let's map  
18 one on the other. And we say, holy mackerel,  
19 it looks like all of these people that were  
20 doing these kinds of things, this test at this  
21 time, we don't have bioassay for them. See,  
22 I'm looking at it as if I'm an investigator

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1 trying to see where the evidence points me.  
2 And of if all of sudden I say, boy, I got a  
3 bunch of people here that worked at this  
4 facility, at this site, at this time we did  
5 this, and I don't have bioassay data for them,  
6 at least not back, the next question is, is  
7 that okay? And then you go into the records.

8 Now you start to go vertical and  
9 say, okay, maybe there's a good reason why all  
10 those people don't have bioassay data. And  
11 then we get to the story you told before,  
12 there is good reason because they took live  
13 samples, they took air samples and at least  
14 there was due diligence for making the  
15 judgment that that particular person or group  
16 of people at that time did not have to have  
17 bioassay.

18 And if that story comes closest in  
19 that form, you know, it's very convincing.  
20 But if you find yourself in a situation where  
21 all of a sudden the people who have identified  
22 the scenarios and, you know, say that I've got

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1 all these people and it looks like they should  
2 been bioassayed, and then you go and map the  
3 bioassay and they're not bioassayed, and  
4 there's no good reason why they weren't  
5 bioassayed, I think that's a problem. I think  
6 that that leaves you open to vulnerability.  
7 And here we have groups of people that weren't  
8 bioassayed, that we don't have any real  
9 justification why they weren't bioassayed.  
10 What do you do about that? Because eventually  
11 we're going to have to reconstruct their doses  
12 and how are we going to do it? And I think  
13 that's how the story -- that's how I would  
14 package the story.

15 CHAIRMAN PRESLEY: John, this is  
16 Billy. Would you agree that -- well since  
17 there are less than one percent of the people  
18 ever badged with external dosimeters at NTS  
19 that got any external exposures, would you  
20 agree that then the potential of people to get  
21 internal exposures would be higher than that?

22 DR. ANSPAUGH: I would say not

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1 always.

2 MR. MAKHIJANI: There's no basis  
3 to establish that. We've been debating the  
4 external and internal forever and so far we  
5 don't have any evidence to relate to people.

6 MR. SMITH: Well, you know, the  
7 data indicates -- based on the bioassay  
8 program that was in operation at NTS indicated  
9 that people got very few internal exposures.  
10 There were very few positive doses relative to  
11 the number of bioassay samples taken. And I'm  
12 thinking what Mark is saying is what needs to  
13 be laid out on the table is the number of  
14 bioassay samples taken of workers, not  
15 necessarily by job category, by all of the  
16 bioassay samples that were taken. And we can  
17 evaluate those to see whether or not there was  
18 any real potential for people to get  
19 internally exposed.

20 DR. NETON: I agree. I think  
21 we're jumping the gun here a little bit. We  
22 need to get a handle on what we have first.

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1 And then if we can get the data, and then we  
2 can do this sort of robustness test that John  
3 is talking about. I'm a little concerned that  
4 the way it sounds to me that these job  
5 categories, you know, you could have linemen,  
6 electricians, carpenters and you'll have some  
7 with bioassay and some without bioassay. And  
8 I'm not convinced that we can go in there and  
9 definitively determine why some were monitored  
10 and some weren't. I mean, we might be able  
11 to. We'll have to do some sort of maybe spot  
12 sampling, because I just can't imagine going  
13 through everybody's record to establish all  
14 their work --

15 DR. MAURO: Yes, of course.

16 DR. NETON: But on top of that,  
17 what happens if for instance we pull these  
18 data and all these crafts folks have no  
19 detectable bioassay to begin with and we can  
20 demonstrate that those were the ones that were  
21 targeted as the highest potentially exposed.  
22 so what's the reason to believe that this

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1 other population had any exposure? You know,  
2 those are the kind of arguments we're going to  
3 have to make.

4 DR. MAURO: All you could do is  
5 build a weighted average.

6 DR. NETON: Exactly. So, I think  
7 we're proposing that we're prepared to do  
8 that. But let's first go to the data and see  
9 what we can pull out. If we can't pull out a  
10 lot of data, then we're back at square one and  
11 we'll have to rethink what we're doing.

12 CHAIRMAN PRESLEY: Bob?

13 MR. MORRIS: Does this suggest  
14 that we need a technical call to agree -- that  
15 would be off line to agree on these groups  
16 that we want to craft?

17 CHAIRMAN PRESLEY: Yes, I think  
18 that what we need to do first is let Jim do  
19 what he suggested before we do that and see if  
20 we really need to go and pick the groups.  
21 Now, the group thing was my idea and it may be  
22 down the road it may be good. But let Jim do

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1 his thing, Mark, and then let's go back and  
2 see if they think that we need to. At that  
3 point then, yes, we can have a discussion  
4 between SC&A and CDC to see where we need to  
5 go.

6 MR. MAKHIJANI: I agree with that,  
7 too.

8 CHAIRMAN PRESLEY: And then we can  
9 have another Working Group after that. But I  
10 don't think we're going to go anywhere now  
11 without you all doing your homework on these  
12 bioassay data.

13 MR. MAKHIJANI: I agree with that,  
14 too.

15 CHAIRMAN PRESLEY: Okay. Does the  
16 Working Group agree with that, everybody?

17 MEMBER CLAWSON: Yes.

18 CHAIRMAN PRESLEY: Okay. That's  
19 great. We agree on something.

20 At this time, John, have we gone  
21 through this as far as we can go now until --

22 DR. MAURO: Yes.

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1 CHAIRMAN PRESLEY: Okay.

2 MR. KATZ: Just for the record,  
3 this was an SC&A --

4 CHAIRMAN PRESLEY: Right, the  
5 coworker model. And, John, we will get you a  
6 copy so that you can see this.

7 John Funk, you there?

8 MR. FUNK: Yes, sir.

9 CHAIRMAN PRESLEY: We will get you  
10 a copy as soon as this has been cleared.  
11 Okay. And we'll send you a copy.

12 And yes, Arjun?

13 MR. MAKHIJANI: Could I say  
14 something about that, Mr. Presley? Yesterday  
15 I got the suggested redactions in the areas  
16 where there are Privacy Act issues from Nancy  
17 Johnson, who is our point of contact with HHS.  
18 And as you know, this report contains a lot of  
19 potential Privacy Act data and I have to  
20 consult with Nancy and John, and maybe Emily  
21 as to what the best way to do it. And maybe  
22 that we would only be able to release the

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1 summary or eliminate the tables and the text  
2 then might not make sense. It's going to take  
3 a few days --

4 CHAIRMAN PRESLEY: John, you may  
5 not get to see everything on this one that  
6 we've got on account of the Privacy Act  
7 information.

8 MR. FUNK: I figured that.

9 CHAIRMAN PRESLEY: Okay. If it's  
10 acceptable to everybody, a lot of us have to  
11 go home this afternoon. Charles has an early  
12 flight. I think John has an early flight. I  
13 know I have a long drive. If it's acceptable  
14 to everybody not to break for lunch right now  
15 and let's hear what John has to say. Unless  
16 somebody -- before we break for John, does  
17 anybody else have anything that comes in front  
18 of the Working Group at this time?

19 MR. KATZ: I just want to, before  
20 John as well, I have this question to you:  
21 You have an update scheduled for the board  
22 meeting in Amarillo. Does the Working Group

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1 need to discuss the wherewithal of that update  
2 in any way?

3 CHAIRMAN PRESLEY: I was going to  
4 do that.

5 MR. KATZ: Okay. But, I guess I  
6 would get that work done before --

7 CHAIRMAN PRESLEY: Yes.

8 MR. KATZ: -- opening the floor  
9 for John.

10 CHAIRMAN PRESLEY: I just wanted  
11 to make sure that what we -- Gene and I had  
12 talked, I haven't talked to Wanda, I haven't  
13 talked to Brad or Phil, but you all should  
14 have our notes that we had for the -- we were  
15 getting ready to give a presentation on March  
16 -- wrong one. Back in 2008, we had slides  
17 made up to do a presentation -- here it is.  
18 Right here. Okay. June 24th, 2008. We sent  
19 out a set of slides for a talking  
20 presentation, which we did not use.

21 What Ted has asked is that we go  
22 back from day one, give the Board an update on

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1 where we have been and where we think we are  
2 going.

3 I also want Jim to be ready to  
4 give a report to the full board on where  
5 HHS/CDC stands.

6 John, I would like for you to do  
7 the same thing with SC&A on your work and  
8 where we stand.

9 If anybody has -- what we're going  
10 to try to do is get this done in the next week  
11 and then get it to the Working Group as a  
12 draft. I'll also send Mark a copy, John a  
13 copy and Ted a copy. Then everybody can make  
14 the comments on that and we will try to have  
15 this done for May 1st.

16 Is that acceptable to everybody?

17 DR. MAURO: Bob, let me just say  
18 there is nothing more than -- as far as I  
19 understand it, our work is done until the  
20 Board asks us to do something. So we are now  
21 sitting and waiting for direction. So the  
22 answer to your question is, with that delivery

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1 of that report, there is no more activity on  
2 SC&A's part.

3 CHAIRMAN PRESLEY: At this time?

4 DR. MAURO: At this time.

5 CHAIRMAN PRESLEY: At this time.

6 But now, I would like for you to give a report  
7 on what you all have worked on, if you don't  
8 mind?

9 DR. MAURO: Oh, summarize that?

10 CHAIRMAN PRESLEY: Yes, summarize.

11 DR. MAURO: Yes, absolutely.

12 CHAIRMAN PRESLEY: That I would  
13 do.

14 MEMBER CLAWSON: So let me get  
15 this clear. We're going from a two-day  
16 meeting now to a three-day? Or is this an  
17 abridged version of where we're at?

18 CHAIRMAN PRESLEY: We have an hour  
19 on the schedule to do an abridged version of  
20 where we're at. If questions arise, then,  
21 yes, we're going to take a little bit of extra  
22 time and answer those questions to the best of

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1 our knowledge. We will have the people at the  
2 meeting that can answer those questions. But  
3 we do have an hour scheduled with the  
4 possibility of an hour-and-an-a-half, as I  
5 understand.

6 MEMBER CLAWSON: And I know that  
7 that sounded kind of funny, but going back  
8 through my files we have absolutely thousands  
9 and thousands of pages.

10 CHAIRMAN PRESLEY: That's correct.  
11 We do. We've got an unreal -- I've got two  
12 sticks here full of stuff. One of them is  
13 full of John's data that he's got to us.

14 But that is my path forward as I  
15 see it, as the Working Group Chair. If  
16 anybody has anything different from that, let  
17 me know.

18 We are trying to end up our work  
19 on the site profile. I don't think, I don't  
20 know if we'll ever be able to vote on it. I  
21 don't know. At some point in time I would  
22 like to be able to say, okay, the site profile

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1 stands as it is today, that it is a working  
2 document. If somebody brings a change in,  
3 then yes, it's going to be changed. If that  
4 change is big enough or if it changes enough,  
5 then we're going to go back and take another  
6 look at dose reconstructions that have been  
7 made. But I want us to start working on the  
8 SEC after this meeting.

9 John, where do you all stand  
10 there?

11 DR. MAURO: Well, I have to say  
12 that I guess I don't see it the way you  
13 described it.

14 CHAIRMAN PRESLEY: Okay.

15 DR. MAURO: I mean, the way I see  
16 it is that there are a number of very  
17 important issues. For example, the new model  
18 or the revised model for the -- from dust  
19 through suspension. What may emerge related  
20 to Table 7-1 and some revised version or  
21 whatever occurs from that, to me this is the  
22 heart and soul of the site profile. Because

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1 what we're talking about are new strategies,  
2 new data, new approaches that in the end are  
3 going to result in I believe substantial  
4 modifications to the current version of the  
5 site profile.

6           So if you claim or state that the  
7 site profiles issues have been resolved, it  
8 seems to be misleading because as long as  
9 these issues are being worked on, then the  
10 site profile needs to be changed, I don't know  
11 what that does. And one of the things I'm  
12 concerned about is that does this mean that  
13 your dose reconstructions for the claimants  
14 are on hold until these issues are resolved?  
15 Is that one of the things that happens when  
16 you're in this mode of dealing with an SEC?  
17 There's a lot of work on the dose  
18 reconstructions topic.

19           DR. NETON: The answer is it  
20 will --

21           MR. ROLFES: It depends. I was  
22 going to say when we would encounter a claim

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1 that has no bioassay data but has, you know,  
2 for example some significant external doses  
3 and access logs for example, and statements  
4 and interviews in the claim application that  
5 say that they participated in, you know, this  
6 radiological activity and were exposed to  
7 airborne contamination. You know, when we  
8 have indicators that show us that this  
9 individual clearly had some potential for  
10 internal exposure, we would say, hey, this  
11 claim -- we need to hold onto it.

12 DR. MAURO: I understand. So in  
13 this call, to the extent you can, it's a  
14 judgment call on a case-by-case basis.

15 MR. ROLFES: Yes, and there are  
16 additional methods besides just using bioassay  
17 data in order to bound that individual's  
18 potential internal dose. And, you know, those  
19 methods that we've discussed previously  
20 include like OTIB-0018 assigning the maximum  
21 permissible concentrations to the individual  
22 to bound their potential internal doses. But

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1 there are several methodologies that we could  
2 use.

3 And so to my knowledge, there are  
4 no claims right now that I am aware of that we  
5 are awaiting a constructed coworker intake  
6 model on. So really, we don't have any claims  
7 that we are holding onto because we don't have  
8 a method to reconstruct their internal  
9 exposures.

10 DR. NETON: Having said that  
11 though, this does have a potential to change  
12 some of the reconstructed --

13 CHAIRMAN PRESLEY: Right. Right.

14 DR. NETON: We have identified  
15 classes of workers where we may have used  
16 inappropriate -- I'm not saying that we are,  
17 but if we come to that conclusion, then we'd  
18 have to go back and rework those --

19 DR. MAURO: The outcome of this  
20 process might be --

21 DR. NETON: But I totally agree  
22 with your characterization, John. And it

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1 seems to me that the SEC is the more  
2 overarching issue.

3 DR. MAURO: Right. That's what  
4 I'm --

5 DR. NETON: And the site profile,  
6 if you can resolve the SEC issues, you still  
7 may have site profile issues remaining. I  
8 mean, so it seems to me that until the SEC is  
9 put to bed, the site profile can't be closed.  
10 And that's just --

11 CHAIRMAN PRESLEY: That's no  
12 problem.

13 MR. MAKHIJANI: This is an  
14 addendum to what Jim just said. I mean, the  
15 two reports that were mainly discussed today,  
16 the October report and the March report, were  
17 really prepared as a comment on the evaluation  
18 report for the SEC. They were not prepared,  
19 you know, in the site profile discussion.

20 CHAIRMAN PRESLEY: Right.

21 MR. MAKHIJANI: And so I  
22 completely agree.

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1 CHAIRMAN PRESLEY: And that's  
2 something that we discussed in the past.

3 MR. MAKHIJANI: Right. We have.

4 CHAIRMAN PRESLEY: That this issue  
5 is a site profile issue and --

6 MR. MAKHIJANI: It could become.  
7 I mean, it could -- if it resolves, there will  
8 become a site profile issue.

9 CHAIRMAN PRESLEY: Right.

10 MR. MAKHIJANI: And if it's not  
11 resolved, it will become --

12 CHAIRMAN PRESLEY: Yes.

13 DR. NETON: My sense is that if we  
14 resolve these SEC issues, the site profile  
15 issues are gone and --

16 MR. MAKHIJANI: Right.

17 CHAIRMAN PRESLEY: That's exactly  
18 right.

19 DR. NETON: Yes, I think it's all  
20 going to come --

21 DR. MAURO: But, and I said this a  
22 while ago, and in my mind as long as there are

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1 SEC issues on the table, that means there are  
2 site profile issues on the table.

3 DR. NETON: Yes, absolutely.

4 DR. MAURO: They're linked. Now I  
5 would say the opposite of that though, you  
6 could have a lot of site profile issues and  
7 have no SEC issues. But if you have any SEC  
8 issues, they by definition --

9 DR. NETON: There's something  
10 wrong with your site profile, yes.

11 CHAIRMAN PRESLEY: I want the  
12 petitioner out there to understand that we are  
13 not holding up any petitions by our longevity  
14 on this NTS issue.

15 MR. KATZ: You mean you're not  
16 holding up any dose reconstruction?

17 CHAIRMAN PRESLEY: Right.

18 MR. KATZ: Yes.

19 CHAIRMAN PRESLEY: Anybody else  
20 have anything else before we let John speak?

21 DR. NETON: Bob, just a point of  
22 clarification. The NIOSH presentation you'd

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1 like at the Advisory Board meeting, I assume  
2 that that's just a verbal note. I don't need  
3 a slide presentation or anything?

4 CHAIRMAN PRESLEY: If you want to  
5 have slides, I think that would be nice.  
6 We're going to have our slides and I'm going  
7 to talk to you, you know, asking you to --

8 DR. NETON: Okay. Well, we could  
9 do that.

10 CHAIRMAN PRESLEY: You know, and  
11 I'm not talking about 30 or 40 slides. I'm  
12 talking about maybe a one or two where you all  
13 stand.

14 DR. NETON: Yes, our current  
15 status?

16 CHAIRMAN PRESLEY: Right.

17 DR. NETON: So I think John can  
18 summarize --

19 DR. MAURO: I wrote down that I  
20 will write some brief report that gives our  
21 perspective on what we did.

22 CHAIRMAN PRESLEY: Right.

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1 DR. NETON: How we got here.

2 DR. MAURO: If you want, I can --  
3 where we are. I'll send that in. Do you want  
4 me to also to be prepared to get in front of  
5 the microphone and tell the story?

6 CHAIRMAN PRESLEY: Yes. Yes, sir.

7 DR. MAURO: Okay.

8 DR. NETON: My view is that you  
9 would present how we got to where we are  
10 versus even now, then I would present how  
11 we're dealing with it right now, the current  
12 status.

13 CHAIRMAN PRESLEY: Are we in  
14 agreement?

15 MEMBER MUNN: I'm fine with the  
16 current plan.

17 CHAIRMAN PRESLEY: Gen? Phil?

18 MEMBER ROESSLER: Fine.

19 MEMBER SCHOFIELD: Fine.

20 CHAIRMAN PRESLEY: Everybody all  
21 right? Arjun?

22 MR. MAKHIJANI: Yes.

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1 MR. KATZ: So, John?

2 MR. FUNK: Yes?

3 MR. KATZ: Are you with us? Let  
4 me just, as a preface before sort of raising  
5 your questions and issues, just, please --  
6 well keep to the issues of the SEC matters,  
7 site profile matters. I know you have issues,  
8 you may have issues with your own particular  
9 claim, but please, please avoid those matters  
10 for this question and answer session. Thanks.

11 It's all yours, John.

12 MR. FUNK: Okay. Thank you,  
13 ladies and gentlemen of the Board. I'll  
14 dispense with the formality of recognizing you  
15 all. Right at the minute, I don't have your  
16 list of names in front of me.

17 I'd like to bring up -- there's  
18 been some discussion as to the amount of  
19 radsafe personnel who were on the site. I  
20 worked out there from 1976 until 1994. If  
21 such a contingent of radsafe monitors were on  
22 the test site, I can sure tell you I never

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1 seen any of them. I seen a few of them around  
2 occasionally, but not to the degree what  
3 you're trying to portray that they were out  
4 there.

5 There is a potential for more  
6 exposure in the Flats, but you have to look at  
7 the right people. And I'll make a suggestion  
8 as to that. One of the personnel who could  
9 have suffered more exposure than anybody else  
10 would have been the superintendents for RICO,  
11 especially -- I'll give you some names.  
12 [Identifying Information Redacted].

13 MR. KATZ: Wait, wait. John,  
14 please don't give us actual names. I would  
15 welcome you submitting those names to OCAS,  
16 for example, but this is privacy information.  
17 It would be better if you didn't say the  
18 specific names on the phone.

19 MR. FUNK: All right. I'll --

20 MR. KATZ: Thanks.

21 MR. FUNK: But I would say the  
22 RICO superintendent, because they always --

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1 they were involved in all the site  
2 assessments, reentry. They were involved in  
3 all the additional reentries. There has been  
4 some discussion as to where incidents happened  
5 that bioassays would have been demanded. I  
6 can truthfully tell you that there was  
7 incidents that happened out there that nobody  
8 turned in that never became an incident. They  
9 simply just let it slip to the side and let it  
10 go. I won't get into that, because one case  
11 involved my case personally, so I won't  
12 discuss that one.

13           There's also a lot of  
14 misinformation here about potential for  
15 exposure comparing tunnel workers to flat  
16 workers. I would hope that that would be  
17 looked into further. I've talked to John  
18 Mauro and Dr. Anspaugh on this. They are well  
19 aware of my concerns.

20           I had a formal presentation put  
21 together here, but it kind of went south  
22 because it seems like a lot of the issues I

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1 had had, had seemed to be already resolved  
2 before I even got opened into it. I noticed  
3 some of the Board Members asking certain  
4 questions that led me to believe that they've  
5 already become aware of some of my concerns.

6 And I would like for this --  
7 before we make any decision as to the  
8 occupational internal/external environment  
9 exposures, that they get some of their site  
10 profile supporting documents squared away and  
11 identify the different shots or the different  
12 types of shots they were before they can  
13 proceed on that.

14 And other than that, it seems like  
15 everything seems to be going okay. So I'll go  
16 ahead and let you guys get home.

17 CHAIRMAN PRESLEY: Okay. John,  
18 thank you very much. We appreciate your  
19 comments. Are you feeling better?

20 MR. FUNK: Oh, yes. Yes, I'm back  
21 a little bit better.

22 CHAIRMAN PRESLEY: Thank you very

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1 much for your comments. We appreciate it.

2 One of the things that Brad has  
3 brought up is Area 51. Where we stand with  
4 Area 51?

5 MEMBER CLAWSON: Especially the  
6 earlier years. I know that we finally  
7 acknowledged it, but I haven't heard anything  
8 since.

9 MR. ROLFES: Area 51 is  
10 considered --

11 (Whereupon, the proceedings went  
12 off the record at 12:32 p.m. and resumed at  
13 12:32 p.m.)

14 MR. KATZ: Okay. Folks on the  
15 phone, we lost power for a moment, but we  
16 stopped conversation at the same time. So I  
17 don't think you've missed anything.

18 MR. RICH: Okay. We're back.

19 CHAIRMAN PRESLEY: Now, we're  
20 talking about Area 51. Okay? What we  
21 discussed in quite a few of the early meetings  
22 was that Area 51 is part of the test site.

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1 And the people that were into the nuclear-type  
2 work were still -- they fall under the NTS  
3 umbrella. Is that correct, Mark?

4 MR. ROLFES: That's correct. And  
5 for example, for the DOE personnel that  
6 entered Area 51, they were subjected to the  
7 exact same monitoring requirements as the rest  
8 of the Nevada Test Site. And I think that's  
9 really the bottom line. It has been added as  
10 part of the Nevada Test Site and it is  
11 believed to be within the confines or within  
12 the border of the Nevada Test Site as  
13 indicated by a memorandum from DOE to DOL.

14 CHAIRMAN PRESLEY: Yes, I remember  
15 when that letter went out.

16 Arjun?

17 MR. MAKHIJANI: Do we have any  
18 indication about the exposure potential? You  
19 know, we were talking about categories of  
20 workers and how you're going to find the  
21 people with the high exposure potential. Do  
22 we have any way of comparing the exposure

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1 potential of the people who went in and  
2 whether they were monitored, because --

3 MR. ROLFES: Yes, they were. They  
4 were monitored.

5 MR. MAKHIJANI: Will be able to  
6 establish that?

7 MR. ROLFES: Yes, if you look at  
8 the NOCTS records, the data that we've been  
9 receiving from DOE has actually included any  
10 exposures received in Area 51.

11 MR. MAKHIJANI: Okay.

12 MR. ROLFES: That has been  
13 routinely provided to us historically.

14 MR. MAKHIJANI: Bob Barton, are  
15 you there?

16 MR. BARTON: Yes, I'm here, Arjun.

17 MR. MAKHIJANI: Did we find any of  
18 that in our 220-worker examination?

19 MR. BARTON: Specific to Area 51,  
20 I can't say offhand. I know we found some  
21 film badge records that indicated Working Area  
22 52, which I believe was the Tonopah Test

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1 Range.

2 MR. MAKHIJANI: Right.

3 MR. BARTON: But as for exposure  
4 in Area 51, I can't say offhand.

5 MR. MAKHIJANI: Okay. Because I  
6 don't recall it.

7 MR. ROLFES: Okay. If you take in  
8 the NOCTS records that we do have from DOE,  
9 there are in fact Area 51 exposure records.

10 MR. FUNK: I'll make a correction  
11 to that. This only covers Department of  
12 Energy workers. The aerospace workers are not  
13 covered under this site profile recognition.

14 MR. ROLFES: We are only  
15 reconstructing Department of Energy or  
16 Department of Energy contractor exposures that  
17 were incurred.

18 CHAIRMAN PRESLEY: That's correct.  
19 Yes. No, Air Force, no aerospace workers.  
20 Yes, John. Is that all right, John?

21 MR. FUNK: Yes, sir. Yes, sir.

22 CHAIRMAN PRESLEY: Brad, did that

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1 answer your question?

2 MEMBER CLAWSON: Yes, I just  
3 wanted to make sure because this has been an  
4 issue that had been brought up earlier. I  
5 know they recognized it finally and I just  
6 didn't know where we was at, if we had looked  
7 at this. Because one of the issues were  
8 people working up there during the open air  
9 shots and so forth.

10 One other question, though.  
11 Tonopah was put under something else, wasn't  
12 it?

13 MR. ROLFES: It was part of the  
14 Sandia Test --

15 MEMBER CLAWSON: Sandia? Okay.

16 MR. ROLFES: -- Sandia's site  
17 profile.

18 MEMBER CLAWSON: That's what I  
19 wanted to make sure, because originally this  
20 came up as Tonopah and 51. I know that there  
21 was a break there and I just wanted --

22 MR. ROLFES: There's quite a bit

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1 of distance between the two sites, so --

2 MEMBER CLAWSON: Right. And I  
3 just wanted to make sure how we were handling  
4 it.

5 CHAIRMAN PRESLEY: John, are you  
6 happy with that?

7 DR. MAURO: Regarding Area 51?

8 CHAIRMAN PRESLEY: Yes.

9 DR. MAURO: Yes, my understanding  
10 of its relevance here is that that's -- is  
11 anything about the exposures that may have  
12 occurred to covered workers in Area 51, it has  
13 to be captured by whatever methods are used.  
14 Whether it's the re-suspension model that  
15 we're talking about and whether it is the  
16 bioassay data. So if there's any reason to  
17 believe that there were work activities that  
18 took place in Area 51, there's a potential for  
19 elevated internal exposures. So it's really  
20 no different than anything else. So we just  
21 have to make sure that we -- you know, and if  
22 the data are there, they're there.

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1                   MR. FUNK: John, there was quite a  
2 bit of clean up in one area where they  
3 excavated three foot of soil from a huge area.  
4 I think it was two square miles.

5                   DR. MAURO: Well, I mean, there's  
6 reason to believe that type of activity, just  
7 like some of the events we talked about, or  
8 anything else, it's something that where  
9 workers intuitively would say there's a  
10 potential there for substantial internal  
11 exposure, then they'd fall into that group of  
12 workers and we'd map that if we have bioassay  
13 data. And if we do, we do. If we don't, why  
14 not? So I guess there's nothing about that  
15 that separates it.

16                   CHAIRMAN PRESLEY: Not as far as  
17 I'm concerned.

18                   MR. FUNK: Area 51 has been  
19 overlooked on Baneberry. They talk about  
20 everything, the whole site with the exception  
21 of Baneberry. And Area 51 should be included  
22 in the Baneberry report.

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1 CHAIRMAN PRESLEY: All right.

2 Thank you, John.

3 Ted?

4 MR. KATZ: No.

5 CHAIRMAN PRESLEY: Does anybody  
6 else have anything else? Any of the Working  
7 Group have anything for the betterment of the  
8 group?

9 MEMBER MUNN: No.

10 CHAIRMAN PRESLEY: Gen and I will  
11 work on this. If you have anything that you  
12 all think needs to be put in this report to  
13 the Board, please send it to me or Gen and we  
14 will take what notes that I gave to Gen from  
15 your past meetings and get it in there. And  
16 then we'll get a working draft out to  
17 everybody to look at. Because I sent Gen  
18 about 10 or 15 pages of stuff from the past  
19 that we had on our previous reports to the  
20 Board.

21 MEMBER CLAWSON: I'd like just  
22 like a -- I'll probably delete it because we

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1 didn't use them. Yes, sorry.

2 MEMBER ROESSLER: I can give you a  
3 copy right now of that.

4 MEMBER CLAWSON: You can forward  
5 it to me.

6 CHAIRMAN PRESLEY: She's got  
7 everything on one --

8 MEMBER ROESSLER: I've got it  
9 right here. We can just plug it in and --

10 CHAIRMAN PRESLEY: Yes, that would  
11 be the easiest thing to do. Because I'm going  
12 to back and --

13 MEMBER ROESSLER: And if you would  
14 take a look at it and mark it up and update  
15 it, that'll help us.

16 MEMBER CLAWSON: Okay.

17 CHAIRMAN PRESLEY: Anybody have  
18 anything else? Thank you all for your  
19 participation. This has been a good group.

20 MR. KATZ: Okay. We're adjourned.

21 (Whereupon, the meeting was  
22 adjourned at 12:39 p.m.)

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