

1 NIOSH having responded, it's correct, it's
2 closed, but we have not reviewed it, just for
3 the record.

4 **MS. MUNN:** Bob, my notes show me from our last
5 meeting on October 25th, I believe --

6 **MR. PRESLEY:** Uh-huh.

7 **MS. MUNN:** -- that the only outstanding item
8 there was for this group to check for
9 completeness, and I don't know whether as a
10 group that's occurred. I did take a very quick
11 look at it looked complete to me, so...

12 **MR. PRESLEY:** Yeah.

13 **MR. CLAWSON:** Bob, this is Brad. One of -- one
14 of the questions I have is, you know, we have
15 put these out and NIOSH has made these changes,
16 but to me, SC&A has not still reviewed these
17 items and they were the ones that brought up
18 many of the issues on this.

19 **MS. MUNN:** Since we've responded to them -- if
20 we had the response and the action was for us
21 to check and feel that it was complete. And
22 you know, we can go back and forth forever with
23 -- with additional material for our technical
24 contractor, but they've already looked at this,
25 identified what they wanted to have happen, and

1 Mark has said that it's been done. We have
2 looked at it. It's done. There's no --
3 bringing any other rock seems inappropriate.

4 **MR. CLAWSON:** Well, and I understand that,
5 Wanda. That'd be like me taking my car in and
6 telling them to fix something and then walking
7 off and never making sure that the whole
8 problem was ever really taken care of. I know
9 that some of these radionuclides have been put
10 in there, too, but in Table 2-A with the TBD --
11 you know, we -- I'm -- I'm sorry, I can't put
12 all that much time into these and so forth like
13 the -- and it's kind of interesting to me if we
14 have SC&A raising these concerns, one of the --
15 one of the conclusions that we have to come to
16 is as the Board members, correct, but we've got
17 to make sure that also that their issues were
18 addressed fully and to the -- to the
19 satisfaction we can do, and that -- that's all
20 I want to make sure.

21 **MS. MUNN:** Well, I guess I need to hear from
22 SC&A on this point. Is this -- are you telling
23 us that in order for you to agree that the work
24 has been done that was requested, you have to
25 perform an additional review function? Is that

1 what I'm hearing?

2 **DR. MAURO:** This is John Mauro. Maybe I could
3 help out a little bit.

4 **MS. MUNN:** That would be helpful, John.

5 **DR. MAURO:** Yeah, as a precedent, I us-- I
6 usually go back to the -- when we first engaged
7 this issue and that was with Bethlehem Steel
8 where we brought up -- identified six issues.
9 The issues were dealt with by white papers.

10 **MS. MUNN:** Uh-huh.

11 **DR. MAURO:** Eventually we all agreed yes, we've
12 reviewed the white papers, they -- these do
13 resolve all the issues and then we edited it at
14 that point. Six months later a revised
15 Bethlehem Steel site profile was issued that
16 was represented as, you know, addressing --
17 containing all the new material that was in the
18 white papers and we were never asked to review
19 it. So this is really a matter that I guess if
20 we want to go to precedent, that was found to
21 be an acceptable way to achieve closure.
22 However, certainly if at any point in time the
23 working group or the Board says that, you know,
24 please go back and take a look, I mean we would
25 look at it. But no, we -- we -- to date, it's

1 really been on a case-by-case basis.
2 With regard to procedures, in that working
3 group when we find that the -- NIOSH has
4 responded in a way that says yes, I have
5 addressed the procedure in the following way
6 and there's a white paper, I -- I believe what
7 we call that now is it's in abeyance.

8 **MS. MUNN:** Yes.

9 **DR. MAURO:** Whereby that means that okay, looks
10 like it's resolved, but it'd probably be a good
11 idea to take a look at the procedure after it
12 has been revised.

13 So in a way we -- we have not really come to a
14 uniform approach across the board on how we're
15 going to deal with final closure. And
16 certainly we will take our lead from you folks.
17 Right now we have certainly reviewed the
18 material that was exchanged and as Mark
19 correctly points out, the issues have been
20 resolved from that perspective. And really
21 it's really a question now to the working group
22 of whether or not you want to hold this in
23 abeyance for review or -- or -- as we're doing
24 sort of on the procedures, or -- or say really
25 it's closed, as we did with Bethlehem Steel.

1 So I -- I think that sort of sets the
2 framework.

3 **DR. MAKHIJANI:** Well, let me -- let me kind of
4 maybe throw a specific in there -- Mark Rolfes
5 might help me out. I'm looking at our original
6 site profile review from December 2005 --

7 **MR. ROLFES:** Uh-huh.

8 **DR. MAKHIJANI:** -- and the three that you added
9 are in that list which we -- of activation
10 products which we said were not -- the original
11 table. There were also a number of others,
12 like neptunium-239. I don't know what happened
13 with that one, for instance. So we haven't --
14 yeah, the three have been added. There were --
15 there were three that we called out, but we
16 don't know what happened to the others or
17 whether the list is complete or whether the
18 Board wants us -- the working group wants us to
19 investigate that.

20 **MR. ROLFES:** Okay. This was not meant to be a
21 listing of all radionuclides that could have
22 been produced, but these are the radionuclides
23 that were of dosimetric importance based on
24 REECO's historical information during the
25 testing era.

1 **DR. MAKHIJANI:** Right, and what I'm saying is
2 if -- that we've identified a number of them
3 and we have not reviewed either your basis for
4 concluding that these were the only ones of
5 dosimetric importance and why the other ones
6 that were called out were not included and what
7 the relative merits of these things are. So
8 for -- for example, the chlorine-38 has a half-
9 life of 37 minutes but neptunium-239 has a
10 half-life of more than two days, and so --
11 anyway, we -- we -- we have not looked at the
12 NIOSH basis from the point of view of NIOSH
13 saying they've done something. NIOSH has done
14 something, but we have not reviewed that and
15 we've not been asked by the working group to
16 review that.

17 **DR. WADE:** This is --

18 **DR. MAKHIJANI:** But the working group may
19 itself review it, so this -- this is fine. I
20 mean I'm just making a statement of fact.

21 **DR. WADE:** Well, this is Lew. Maybe I could
22 speak just briefly to this issue generically.
23 I mean the -- the final say on whether or not
24 an item is closed or not rests with the working
25 group. Eventually it rests with the Board.

1 SC&A is there to assist the working group as it
2 feels it's necessary, and in some cases after
3 one iteration it might be clear to the working
4 group that an issue is closed and they could so
5 decide. They might decide in another case to
6 go back to SC&A and ask for another review. I
7 mean it's a -- it's a matter of judgment. The
8 other thing turning against this is that we are
9 looking at (unintelligible) that can strain
10 SC&A's activity possibly as we -- as we go
11 through this year, so working groups need to be
12 mindful of that and decide -- issues rise to a
13 certain level that they need to be looked at
14 again, then so be it, they need to be looked at
15 again. If the working group feels it can make
16 the call, fine. Again, the -- the working
17 group can differ on that and then the chair can
18 decide if the chair would want to hear from
19 each working group member to vote to try to
20 reach some kind of consensus. But it's an
21 issue that we'll face many times and, you know,
22 working group members just have to decide if
23 they're ready to make a call or if they need
24 another iteration by their contractor.

25 **MR. PRESLEY:** This is Bob Presley. I wish I

1 had my minutes in front of me from about four
2 or five meetings back, but this is one of the
3 issues that we took up first. It was
4 completed, and if I remember correctly, this
5 was one of the first issues that we marked off
6 of this thing.

7 Now you know, we were -- we've got our
8 comments, and as far as I'm concerned, you
9 know, SC&A has -- they have made their review
10 of the comments and they made their
11 recommendations. HHS has come in or CDC has
12 come in -- and NIOSH and have made the changes.
13 We have had a couple of meetings to talk about
14 these changes and my estimation, this
15 particular comment is closed.

16 **MS. MUNN:** It appears that the remaining issue
17 really is whether or not SC&A can, without full
18 review, accept the assertion here that the
19 REECo nuclides that were identified of dose
20 concern is a reasonable assessment. If that's
21 a reasonable assessment, then there -- there
22 does not appear to be any remaining issue.
23 Does SC&A have a position with respect to the
24 REECo information?

25 **DR. MAKHIJANI:** Ms. -- Ms. Munn, we haven't --

1 we haven't -- you know, we haven't reviewed the
2 basis of the statement that NIOSH is making
3 that these are the only three that are of
4 dosimetric importance among the activation
5 products mentioned -- original list of
6 activation products that SC&A had in its review
7 was not drawn from -- was not an arbitrary
8 list. It would -- it was drawn from the
9 National Academy of Sciences' report on the
10 Nevada Test Site. And so I presume that the
11 National Academy's list was a well-considered
12 list, and so all -- all I'm -- I'm just putting
13 the facts before you that we had a list of
14 radionuclides that was suggested for
15 consideration for inclusion. We have not seen
16 the technical basis for including or excluding
17 certain radionuclides from that list. Of
18 course it's the pleasure of the working group,
19 you know, what to do with the list that we gave
20 you and what to do with the list that -- that
21 NIOSH has given you. It's -- it's -- I -- I
22 just don't know how to comment more than that.

23 **MS. MUNN:** Well, I -- I think what I got from -
24 - I believe what you just said was you're
25 working from an NAS list and the suggestion of

1 the resolution works from the REECo list from
2 1993. The only -- then that raises in my mind
3 the question does our contractor not feel that
4 the REECo list is acceptable?

5 **DR. MAKHIJANI:** One would have to examine the
6 technical basis of saying that the other
7 radionuclides are not dosimetrically
8 significant. We --

9 **MS. MUNN:** But that's what REECo has said.

10 **DR. MAKHIJANI:** -- we neither looked at the
11 original -- when -- when we did the review we
12 didn't go to the underlying calculations that
13 the National Academy had done. We presumed
14 that they had -- they had done a good job. Now
15 maybe REECo had good reason to -- to reject
16 certain ones. All I'm saying is that we
17 haven't reviewed that and it would not -- it
18 would be a little bit arbitrary for us to say
19 REECo's right and National Academy's wrong, or
20 National Academy's right and REECo's wrong,
21 without actually going and looking at the
22 technical basis. Now if the working group has
23 done that and feels -- feels okay, then that's
24 fine with us, but we haven't done that.

25 **MS. MUNN:** So you didn't look at REECo really

1 at the time that you were doing your review.

2 **DR. MAKHIJANI:** No, this -- this is an-- this -
3 - this is a list that has been added by NIOSH
4 and we -- we presented a list from the -- well,
5 it's -- the citations are there in our review
6 from December 2005.

7 **MS. MUNN:** Yeah, and I -- I didn't go back to
8 those other citations, but REECo is not
9 included in those?

10 **DR. MAKHIJANI:** Well, I don't know what all we
11 looked at. The citation -- I'm just looking at
12 the footnote to the table as to where this
13 particular Table 1 on page -- let me see -- 25
14 of our December 2005 review. That table
15 certainly was footnoted NAS 1989, page 31.

16 **MS. MUNN:** Yes, and then the REECo --

17 **DR. MAKHIJANI:** I don't know elsewhere -- I --
18 we looked at the REECo list, I don't recall
19 right now because I have not -- I have not
20 reread our review, unfortunately.

21 **MS. MUNN:** And I haven't -- I don't have the
22 citations in front of me, either. I don't have
23 the document here, but I -- it would be simple
24 -- one would I think safely conclude that a
25 report which follows the NAS one would be of

1 enough interest to have been reviewed during
2 the period of the initial review.

3 **DR. MAKHIJANI:** Well -- well, you know, I -- I
4 do not know what -- what all radionuclides are
5 on the list. I think -- I think that the
6 question is that REECo found -- that NIOSH
7 found them to be dosimetrically significant,
8 and Mark has looked at it more recently and he
9 should comment on that, but -- but clearly I --
10 you know, I personally don't feel comfortable
11 in saying that -- one list or another. I don't
12 know -- REECo examined the National Academy
13 report thoroughly and -- and redid the
14 calculations and made its evaluation, I just
15 don't know that. And it's -- I'm -- I'm just
16 trying to be as factual as possible --

17 **MS. MUNN:** I understand. I understand.

18 **DR. MAKHIJANI:** -- in terms of what we did and
19 what the issue is.

20 **MS. MUNN:** I understand that, and I'm trying to
21 define the -- the essence of the issue down to
22 its very essence so that we can see what
23 specific point we're talking to. And from my
24 perspective right now, it looks to me the point
25 is whether the original review by our

1 contractor included the REECo study; and if it
2 did, whether it concluded that the REECo study
3 was also a valid one. And I don't know --
4 Mark, can you speak to that at all?

5 **MR. ROLFES:** Well, what I was going to comment
6 on is that what our table does have within the
7 site profile, the radionuclides of concern for
8 various Nevada Test Site activities. There are
9 approximately 80 radionuclides of concern, and
10 each of those radionuclides we have documented
11 the time periods that they're of concern, the
12 time period following the test, and the area of
13 Nevada Test Site where they are in fact a
14 concern. If SC&A has additional information to
15 provide to us, we will be sure to consider that
16 as well. And also if we receive additional
17 information regarding some other radionuclide
18 that we do not currently have knowledge of,
19 we'd be happy to incorporate that into our
20 living site profile. So --

21 **DR. MAKHIJANI:** And I'd also supplement what
22 Mark just said by noting that in NIOSH's own
23 response it says these radionuclide lists of
24 REECo may not be comprehensive, but the lists
25 have been reproduced in this TBD as published

1 by REECo. So you know, I -- we're happy to
2 stand pat as it is. I'm just trying to say
3 factually what has happened and what NIOSH has
4 put on the table is just a partial list, just
5 comparing it to our original list. That's it.

6 **MS. MUNN:** Yes, I -- I understand that.

7 **DR. MAKHIJANI:** (Unintelligible) a very
8 satisfactory (unintelligible).

9 **MS. MUNN:** It seems that it's incumbent upon us
10 as a workgroup to make the decision whether the
11 assertion that the radionuclides that are of
12 dose concern have been now incorporated in the
13 table. That's really the bottom line, I
14 believe.

15 **MR. PRESLEY:** This is Bob Presley. That's
16 correct. And to my knowledge, they have been
17 incorporated.

18 **MS. MUNN:** I have not done the calculations.
19 I'm not capable of doing the calculations.

20 **MR. PRESLEY:** Me either.

21 **MS. MUNN:** But from the previous discussions
22 that we've had, it would appear that -- that
23 significant radionuclides have been included.
24 And as the agency points out, these vary from
25 one test to another and from one time frame to

1 another. I'm willing to accept it as-is.

2 **MR. PRESLEY:** Anybody else got any comment?

3 **MR. CLAWSON:** Bob, this -- this is Brad. I
4 guess -- I guess maybe this is coming up
5 because of a -- some of my issues in -- in
6 Fernald and stuff like that. But part of my
7 issue is -- and my frustration, I guess, from
8 trying to figure out how -- how we really come
9 to closure with these because when -- when we
10 have a review and we have SC&A come in and
11 review these things, and then we have NIOSH do
12 -- you know, they may do 65 percent of what was
13 said, they may do not -- they may say, you
14 know, that they don't have to. I'm trying to
15 figure out -- and excuse my ignorance, but I'm
16 trying to figure where we come to a complete
17 close on this to make sure that everything has
18 been done because a lot of times when NIOSH has
19 changed something, it's -- sometimes we get it
20 changed two or three different places in a site
21 profile or -- or anything else like that. And
22 I realize that these are living documents,
23 these -- the site profile is, but how -- how do
24 we come to close on it when -- I'm trying to
25 figure out -- you know, I guess I'm looking

1 back at SC&A and saying has this been done to
2 your satisfaction, because I'm along with Ms.
3 Munn, I cannot do all these calculations. But
4 I want to make sure that we are doing the best
5 job that we can and that I -- I'm getting --
6 that we're getting everything as clear as
7 possible, that the -- the concerns that were
8 addressed have been taken care of and that they
9 were implemented properly. I guess that's
10 where my -- I'm -- I'm coming to complete
11 close. I guess -- I guess that's where I come
12 to -- when are they really closed.

13 **DR. WADE:** Brad, this is Lew again. And again,
14 some of this is semantics, but some of it
15 isn't. The moment of complete closure will be
16 judged by the working group, and the working
17 group has to decide if it needs assistance in
18 coming to that. SC&A's judgment as to whether
19 the work has been done to their satisfaction is
20 really not a key judgment. They answer the
21 questions that the Board raises. They make
22 comments and critiques on documents, and then
23 it finally rests with the workgroup. Now the
24 workgroup members should feel comfortable in
25 voicing their view that they need their

1 contractor to view a certain issue or to go
2 into more depth. That's perfectly reasonable.
3 And if the working group decides it's fine,
4 that's fine. But eventually it comes to the
5 working group to say we're satisfied with this,
6 using your contractor as you need to to make
7 that judgment.

8 **MR. PRESLEY:** This is Bob Presley. One thing I
9 want to -- I want to say again, and Brad said
10 it, Wanda said it, this is a living document.
11 This thing -- I hate to say it, but fortunately
12 or unfortunately, none of these things will
13 ever be closed. And if something else comes up
14 in them, they're going to be re-opened, they're
15 going to be re-looked at. What we have to do
16 is decide if what we know today has been
17 completed to the best of -- of NIOSH's ability
18 with the -- I guess with the okay of SC&A. And
19 I realize that each time -- SC&A doesn't always
20 see exactly the same eye as -- as NIOSH sees,
21 but -- and the reason for that is a lot of
22 times there's more than one way to do this.
23 And we have discussed these items and discussed
24 them and discussed them and discussed them, and
25 when we have written down here that this is

1 complete and this item is closed, at that
2 point, that -- to me, that item is closed. And
3 you know, if something happens down the road
4 and we need to add another radionuclide, that's
5 possible. It's not closed.

6 **MR. CLAWSON:** Well, and -- and Bob, this is
7 Brad, and I understand that. But part of my
8 problem that I have is the TBD is a living
9 document, but an SEC petition is not. Once we
10 say that it's not an SEC petition, it's not.
11 And it's -- it's -- it's not a living document,
12 and that's -- that's why -- and -- and all of
13 us being from different areas into this, we all
14 want to make sure that these are being done
15 right and -- and I know as a -- as a Advisory
16 Board we don't see eye to eye and I understand
17 that, and I know that SC&A and NIOSH will never
18 really see eye to eye on -- on some things,
19 either. That's just the nature of the game.
20 But -- but I sure re-- you know, as the TBD
21 goes, I realize it's a living document, but we
22 have certain parts out there that are not
23 living documents and we need to make sure that
24 we have covered everything we can to make sure
25 that we're addressing -- especially the SEC

1 petitions -- to full potential.

2 **MR. PRESLEY:** Okay. Well, that -- that's
3 great. But now this is not an SEC petition.
4 This is a site profile document.

5 **MR. CLAWSON:** Right, and I realize that. But -
6 - but that's what we base a lot of our SEC
7 petitions on.

8 **MR. PRESLEY:** That's correct.

9 **MR. CLAWSON:** These TBDs.

10 **MS. MUNN:** But if there's additional
11 information that can be presented, the SEC
12 presents it, and that can very easily trigger
13 another look at the TBD.

14 **MR. PRESLEY:** Correct. That's right.

15 **MR. SCHOFIELD:** This is Phil. There's --
16 there's one other thing here. Some of the more
17 obscure isotopes that -- they may appear or
18 disappear off of this list -- really the one --
19 one down to is how -- what ones were the people
20 monitored for? What ones do they actually have
21 data saying we can safely say the people are --
22 you know, are exposed to this one or this
23 particular isotope is covered by our analysis
24 on another type of isotope or something, you
25 know. What were the people actually monitored

1 for?

2 **MR. ROLFES:** Is that a question for me, Phil?

3 **MR. SCHOFIELD:** Yeah, I mean, you know, some of
4 them may not really need to be on the list.

5 Some of them may -- may need to be there
6 because they weren't monitored for those, and
7 that's something I think that needs to be
8 worked out between NIOSH and SC&A.

9 **MR. ROLFES:** Okay. Well, what I can do is
10 explain a little bit on -- for example, if you
11 take a look at the list -- do you have the list
12 in front of you or...

13 **MR. SCHOFIELD:** No, I -- pull it up there.

14 **MR. ROLFES:** Okay. Okay, for example, people
15 were monitored based on the potential for
16 exposure to a particular set of radionuclides,
17 and that set was based on planning done for
18 each individual shot, as well as air monitoring
19 data associated with those shots. Based on the
20 air monitoring results, if an air monitoring
21 result came back high for a particular
22 radionuclide or a set of radionuclides, the
23 individuals would be assigned to a bioassay
24 program based upon what they were potentially
25 exposed to.

1 For example, if they were potentially exposed
2 to fission products, the individual would have
3 been requested -- would have had a bioassay
4 sample requested of them for fission products.
5 If that fission product -- fission product
6 result came back non-positive, or negative if
7 you would like to refer to it, then nothing
8 further was done at that time, in the early
9 days. If it did come back positive, more
10 specific analyses and follow-up urinalyses were
11 conducted. So each -- for each test, based on
12 the data associated with that test, there were
13 requests for urine samples following an unusual
14 occurrence or a high air monitoring result
15 associated with that test. And that was based
16 on each -- the specifics of each test.

17 **MR. SCHOFIELD:** Now would this information be
18 made to the claimants, too, so that they know
19 what ones they were monitored for?

20 **MR. ROLFES:** Well, the information would be
21 contained within their DOE dosimetry response
22 files, which are available to claimants under
23 the Freedom of Information Act.

24 **MR. SCHOFIELD:** So you're saying they would
25 actually have to file FOIA?

1 **MR. ROLFES:** Correct.

2 **MR. ELLIOTT:** Phil, this is Larry Elliott.
3 Yes, if a claimant wants a copy of their entire
4 file that has been developed while we've had it
5 in our hands and been working it up, and that
6 file would include the DOE dose information
7 that we had requested and received, then we
8 would ask them to provide a FOIA request to us
9 to get that -- reason being that there are a
10 large number of documents contained in these --
11 in these claim files and some of the documents,
12 especially those that we get from the
13 Department of Energy, have a lot of other
14 individual workers' information in the document
15 that's sent to us for that particular claim.

16 **MR. SCHOFIELD:** Uh-huh. Is there any way that
17 in their file they could at least be notified
18 these were the -- whatever element or isotopes
19 you were monitored for, so at least that
20 information is there, not necessarily tied to a
21 particular shot, but they know that they were
22 actually monitored for these things?

23 **MS. MUNN:** This is Wanda. Phil, can I -- can I
24 make a stab at trying to -- trying to make a
25 little sense out of what we're struggling with

1 here? You understand that what is really
2 important is the dose the individual received.
3 The dose will tell you what the biological
4 effect is, regardless of what the isotope was,
5 or group of isotopes were. What happens to you
6 is what's important. What -- what gets to you
7 is what's important. And if you have bioassay
8 data, then you know that.

9 **MR. SCHOFIELD:** Right, but some of these are
10 fairly short-lived isotopes that could have a
11 fairly significant dose tied to them that maybe
12 they needed to be monitored for, maybe they
13 didn't need to be monitored for them.

14 **MR. ROLFES:** Phil, this is Mark again.

15 **MR. SCHOFIELD:** Yeah.

16 **MR. ROLFES:** One of -- for example, if an
17 individual was exposed to short-lived fission
18 products, the most likely -- you know, at NTS
19 external doses were the controlling factor
20 rather than internal doses, and there are
21 studies to support that. The -- if an
22 individual was exposed to fission products, the
23 dosimetric concern would be an external dose
24 that the individual received. And I believe
25 nearly 100 percent of the individuals that

1 entered the Nevada Test Site after the year of
2 1957 were in fact monitored by a dosi-- using a
3 film badge or dosimeter. So many of these
4 radionuclides, rather than being of concern for
5 internal dosimetry, are primarily an external
6 dosimetry concern.

7 **MR. SCHOFIELD:** Okay. Well, see, that answers
8 my question there.

9 **MR. ROLFES:** Okay.

10 **MR. SCHOFIELD:** So that obviously eases my
11 concern on some of this other stuff.

12 **MR. ROLFES:** Okay.

13 **MS. MUNN:** Now we're back to the basic
14 question.

15 **MR. PRESLEY:** Right.

16 **MS. MUNN:** Is this or is this not a closed
17 matter? Do we or do we not require SC&A to go
18 back and do further calculations to identify
19 that, in their mind, they are content with the
20 list of nuclides that's presented to them as
21 being those of adequate dose concern?

22 **DR. WADE:** And this is Lew. I could do a
23 little bit of process talk, if you'd like me
24 to. We have no rigorous mechanism for
25 decision-making within a workgroup. The

1 workgroup really isn't so much a decision-
2 making body as it is a place where exploratory
3 work is done and issues are explored.

4 In a case like this the workgroup could decide
5 that it will make a decision on an issue like
6 this either by consensus, requiring everyone to
7 support going back to SC&A. They could say --
8 could make it based upon a majority opinion of
9 the workgroup. Or they could say if one
10 workgroup member wants this inquiry to
11 continue, that it would continue that way. You
12 could stop now and decide how you'd like to
13 make a decision generically, and then make it
14 on this case. (Unintelligible) could consider
15 to talk about this case and try and reach some
16 consensus among you. That's really up to you.
17 You could also delegate the responsibility to
18 the chair. I mean there are various ways to
19 make decisions. You know, we've not come to
20 this point before where a workgroup had to
21 hammer out its decision-making process. Maybe
22 we're approaching that now, maybe we're not.
23 But I leave that for your consideration, but
24 those are options available to you.

25 **MR. CLAWSON:** Well, and Lew, this is Brad. I

1 don't mean to butt in there, Bob, but I -- I
2 guess I'm looking on down the road because I --
3 I've seen -- as long as we realize that if this
4 ends up in an SEC or whatever like that, that
5 we may have to end up reviewing this. But
6 maybe for this -- at this point, it -- it
7 doesn't require that much digging back into.
8 You know, they've addressed these radionuclides
9 that SC&A brought up. I'm -- I'm just -- it
10 seems like we -- what I've been seeing on these
11 workgroups is we close it in this and then all
12 of a sudden when we go into an SEC it gets
13 opened back up and things change so much. And
14 I realize these are living documents. I just -
15 - I guess I'm trying to look a little bit
16 further down the road than maybe what I need
17 to. So Bob, I'll turn it back over to you.

18 **MR. PRESLEY:** Okay. What I would really like
19 to do on this is to be able for us to come to a
20 consensus of yes, is this thing closed; or no,
21 then we need to ask the contractor or we need
22 to ask NIOSH to take a better look at this. In
23 my estimation, you know, this thing is -- we
24 have beat it to death. We've done what we were
25 asked to do. And do y'all want to -- to have

1 this thing as a consensus or if one person or
2 two people don't think it's closed, then you
3 know, we can say that when we make our
4 recommendation to the Board.

5 **DR. ROESSLER:** Bob, this is Gen. I would like
6 to see some sort of consensus within the
7 workgroup because if we don't have it, it seems
8 like it's something that's going to pop up
9 again. When things pop up again, then we have
10 delays that were not fair to the claimants and
11 to the groups involved here. I -- I'm
12 wondering just how much time it would take for
13 Arjun or SC&A to look at this particular issue,
14 the -- the radionuclides. It seems -- you
15 know, Arjun's very knowledgeable about these
16 radionuclides. He knows what the contribution
17 would be to dose, and it seems to me it
18 wouldn't take much time. I'd -- I'd really
19 like to have it resolved before we go to Las
20 Vegas.

21 **MS. MUNN:** I'd like to have it resolved before
22 Las Vegas, too. I just feel that we have
23 looked at it and talked about it before, and
24 although there have not been -- as -- as Arjun
25 indicates, we haven't had them specifically do

1 calculations to indicate that there isn't
2 anything else on the NAS report that they feel
3 is of major consequence with respect to -- or
4 reasonable consequence of -- of dose concern,
5 that -- I have no feel for how many items there
6 are on that list, and I -- I have -- we talked
7 about the REECo data many times. And it has
8 seemed acceptable in the past. I'd really like
9 to see us get this over and done with, but I --
10 I'd really much prefer for us to be able to say
11 yes, this is acceptable, go. To me, it's -- it
12 can't help but be like an engineering question.
13 You know, at some point you have to say this is
14 the design to which we're going to build. If
15 major information arises that causes us to
16 believe we cannot build in this way, then we
17 can revise it. But this is our design. And I
18 -- I see what we -- the work that has been done
19 here is expensive. For me, I'm willing to say
20 this is the design. Let's go with this unless
21 we have major reason to believe that this is
22 improper -- that this is not the best science,
23 'cause that's what we're going for is the best
24 science.

25 **MR. PRESLEY:** That's correct. Phillip, have

1 you got a comment on this?

2 **MR. SCHOFIELD:** I'm -- right now I don't really
3 have a problem with the table as it -- as it
4 stands. But then again, you know, there's a
5 lot of these I'm not familiar with. I think as
6 long as we hold that option that we can reopen
7 it if for some reason there's things been left
8 off the list, I feel comfortable at this point
9 in going ahead and going with the list.

10 **MR. PRESLEY:** We can always reopen it. That's
11 no problem.

12 **MR. SCHOFIELD:** Right.

13 **MR. PRESLEY:** That's -- you know, if somebody
14 comes up with -- with a -- a new wrinkle on
15 something, it can always be reopened. So at
16 this point what I'd like to say is, you know,
17 we will -- on each item we will pool the Board
18 as -- not the Board but the working group as to
19 what their wish is, whether we can say the
20 item's closed or -- or then we leave it open
21 and we're going to ask somebody to do some more
22 work on it. At this time that's what I would
23 like to do is the Board to -- to -- to have a
24 consensus on these things. Anybody got any --
25 or not the Board but the working group.

1 Brad, have you got a problem with that?

2 **MR. CLAWSON:** No, I -- I don't, Bob. I just --
3 I -- here's my own frustration and I feel it
4 from all the -- the working groups that -- you
5 know, we come to a closure on this when we're
6 doing the TBD, but as we get back into it, just
7 so that we all realize that this will come up
8 again and we may have to do a little bit
9 further in-depth inspection into it. I guess I
10 was just trying to -- trying to put the cart
11 before the horse a little bit there. I don't
12 have a problem with -- with what we have, just
13 as long as we realize that it'll probably rear
14 its head again in another setting.

15 **MS. MUNN:** There's always an easy in, Phil.

16 **MR. PRESLEY:** Yeah, and -- and you know, you --
17 you could -- could have that list come out at a
18 -- you know, even on -- on another site profile
19 -- okay? -- that would -- that would add
20 something to it somewhere else down the road.
21 But for the -- for the NTS one, I would like to
22 say that we feel like that -- that we have done
23 as much as we possibly can and we accept the
24 comment as completed.

25 **MS. MUNN:** Resolved.

1 **MR. PRESLEY:** As resolved.

2 **MR. CLAWSON:** That'd be fine with me, Bob.

3 **MR. PRESLEY:** Okay.

4 **MR. SCHOFIELD:** I'll agree with that, too.

5 **MR. PRESLEY:** Okay.

6 **DR. WADE:** This is Lew. I'd like to make one
7 general comment. The strength of this Board's
8 process is -- and its workgroup processes, are
9 the input the individual members bring to it,
10 so these kinds of discussions and that broad
11 process to discuss is very important and I
12 thank Brad for raising the issue and I would
13 thank the workgroup for its professionalism in
14 resolving the issue.

15 **MR. PRESLEY:** Oh, yes. Okay, does -- does
16 anybody have a -- a comment that -- that this
17 should not be closed?

18 **MS. MUNN:** I think you've been -- that they've
19 been polled.

20 **MR. PRESLEY:** Okay.

21 **MS. MUNN:** I think all of us have said consider
22 it resolved.

23 **MR. PRESLEY:** All righty, I'm going to mark
24 this one resolved. And I appreciate all the
25 comments.

1 **COMMENT TWO: LARGE HOT PARTICLES TO SKIN AND GI**

2 **TRACT**

3 We'll go on to number two, and it states that
4 the TBD does not provide adequate guidance for
5 dose estimations to the gonads, skin and
6 gastrointestinal tract for the early reactor
7 entry personnel. It has to do with large
8 particles -- large hot particles to the skin
9 and the GI tract. And this mentions then work
10 that was done at the Naval Reactor as well.

11 And Mark, do you want to --

12 **MR. ROLFES:** Yes, we --

13 **MR. PRESLEY:** -- care to comment on this,
14 please?

15 **MR. ROLFES:** Yes, thank you, Bob. We did
16 consider the Naval Radiological Defense
17 Laboratory information that was documented,
18 associated with some of the nuclear rocket
19 development station tests. Information is
20 contained within the site profile now based on
21 the Naval Radiological Defense Laboratory
22 document from 1968, and it is this information
23 that will in fact allow us to bound potential
24 doses to all of the organs listed.

25 This has been addressed in the Nevada Test Site

1 site profile chapter five Revision 1 at Section
2 5.6.5.3 and also in the Nevada Test Site
3 chapter six Revision 1, page change one,
4 Section 6.5.1 and 6.5.2.

5 **MR. PRESLEY:** Okay. Arjun, do you have a
6 comment?

7 **DR. MAKHIJANI:** Yeah, we've -- we've given you
8 our review of the -- of the external dose
9 sections before, as requested, but we have not
10 done any review of the internal dose revision -
11 - this NTS volume five Revision 1. We have not
12 been asked to review that.

13 **MR. PRESLEY:** Okay.

14 **DR. MAURO:** This is John Mauro. I do -- there
15 was one matter in your response -- in your
16 matrix that I did want to raise that needed
17 clarification. I fully agree that using a VAR-
18 - VARSKIN -- you know, you have the wherewithal
19 to derive doses -- localized doses from hot
20 particles --

21 **MR. ROLFES:** Uh-huh.

22 **DR. MAURO:** -- that might land on -- so I -- I
23 -- so I -- I agree with that. The question
24 that I have is when are you going to -- on the
25 one -- it's not really clear, and we've had

1 this discussion I believe related to one of our
2 procedure reviews -- that is -- that if -- if
3 you have an individual and he comes down with
4 skin cancer and -- and -- there wa-- he was
5 operating in a setting with potential for
6 particles, for hot particles --

7 **MR. ROLFES:** Uh-huh.

8 **DR. MAURO:** -- could have been created and
9 landed on his skin, the -- my understanding,
10 and correct me if I'm wrong, is that whether or
11 not you attribute that exposure scenario to
12 that person is going to be based on his records
13 of whether or not, you know, he -- he was found
14 to have any contamination upon leaving a
15 controlled area --

16 **MR. ROLFES:** Uh-huh.

17 **DR. MAURO:** -- and that he required
18 decontamination, and that usually comes out of
19 -- of the CATI interview. And I think that
20 whether you trigger using VARSKIN or not (break
21 in transmission) on whether or not you believe
22 that scenario applies to that person, and that
23 determination is based on the CATI. My
24 question that I raise is really not a -- it was
25 a concern and a question -- is that if there

1 was a high level of assurance that those
2 individuals that were involved in such exposure
3 scenarios can be identified by the CATI
4 interview, I would say great, then you know --
5 then you could triage, you can say who we're
6 going to do this for and who we're not. But my
7 concern was that -- that -- two things. One,
8 it may not be -- that kind of information may
9 not be in the CATI. In addition, even if
10 there's no records that -- let's say a person
11 was leaving an area and they did not detect any
12 hot particles, and my question was -- and I
13 don't have the answer to this -- is it -- is
14 there -- is there a high level of assurance
15 that if a person did have a -- was contaminated
16 locally that the exit survey would capture that
17 so that he could be decontaminated, or is this
18 a circumstance where it's -- you know, there's
19 a fairly good chance a person could have a hot
20 particle and leave with it on him and maybe not
21 -- really won't be removed until he takes a
22 shower at home. So it wasn't the method -- I
23 agree that VARSKIN is the tool and it will
24 allow you to do this. It's whether or not --
25 how you're going to ap-- when you're going --

1 how you're going to go about choosing who
2 you're going to apply that to.

3 **MR. ROLFES:** Yeah, there -- there's a --

4 **DR. MAKHIJANI:** Just so I can supplement that,
5 Mark, a little bit, as I was saying, SC&A did
6 submit on October 10th a response to Revision 1
7 of external dose section, Nevada Test Site
8 Technical Basis Document. And in that we
9 addressed -- we reviewed the revisions that
10 Mark has mentioned in -- in this matrix for
11 volume six, for chapter six of the site profile
12 only, and our comment was exactly that of John.
13 We didn't have a comment with the technical
14 approach, but we did say that issues remain
15 outstanding as NIOSH has provided no
16 substantial evidence that hot particle data
17 actually exists. Rather NIOSH has argued that
18 it would normally not exist, so that's just a
19 quotation from the document that we gave you.
20 So we've reviewed NIOSH's response and -- and
21 not had a technical problem with it. We were
22 in agreement with a portion of it, but -- but
23 not in agree-- you know, not -- not in
24 agreement with the idea that -- that data
25 exists to know when this -- when the exposures

1 happened.

2 **DR. MAURO:** I think we're halfway home. They -
3 - that's the good news. The good news is --
4 it's really one now of, you know, do you have a
5 robust method where there's a high level of
6 confidence that you -- you will pick the --
7 you'll know when to apply these -- these
8 techniques, to which claims.

9 **MR. ROLFES:** Yes, we have a high degree of
10 confidence in the areas of concern where hot
11 particle exposures could have been encountered.
12 The individuals -- and this is pertinent to the
13 Nuclear Reactor Development Station or Nuclear
14 Rocket Development Station --

15 **DR. MAURO:** Yes.

16 **MR. ROLFES:** -- and the individuals that would
17 have been involved in re-entry were those who
18 would have been potentially exposed to hot
19 particles. These re-entry teams were
20 documented and these are typically made up of -
21 - of radiation monitors and other project
22 engineers and scientists.

23 **DR. MAURO:** Oh, okay, that -- that --

24 **MR. ROLFES:** The individuals also would have
25 been dressed in double anti-contamination

1 suits, had shoe covers on, gloves, respirators.
2 The individuals following potential exposures
3 would have been surveyed and dressed out to
4 ensure that there was no contamination. And if
5 a contamination was in fact found, as has been
6 documented in some of the reports, the
7 individual was appropriately decontaminated or
8 de-- you know, if an individual -- there is
9 documentation of some shoe contamination, as
10 well, and the individual's shoes, it does say,
11 were decontaminated or disposed of. So --
12 **MR. CLAWSON:** Mark, this is Brad. I
13 understand, you know, about the re-entry teams
14 and everything else like that, but what I was
15 somewhat a little bit nervous about was -- and
16 we even have members on the Board that were
17 involved in some of these -- was the outlining
18 (sic) areas of some of these tests. I've heard
19 a couple of comment about working -- they
20 weren't working in the propulsion system, but
21 they were a ways away from that and they
22 couldn't leave their trailers and stuff like
23 that until they'd been hosed down and so forth
24 like that because of the -- the spread of this.
25 And this -- this was my one area of worry is --

1 I wasn't worried so much about the re-entry
2 teams, but the surrounding areas that were
3 subjected to some of this fallout.

4 **MR. ROLFES:** Okay, do you know a specific test
5 or a specific time period? There were
6 obviously -- what we're referring to in this
7 discussion is hot particles. There were some
8 occasions where, for example, fission product
9 gases such as radioiodines were released into
10 the atmosphere in --

11 **MR. CLAWSON:** This was -- this was actually
12 with Pluto and when -- when they fired it off
13 and there was some of the outlining (sic)
14 areas, if I'm -- recollection's right, some of
15 the tests that was being done elsewhere, they
16 weren't even at a test -- they weren't even a
17 part of this rocket propulsion system, but that
18 they were -- before they could fire that off,
19 everybody had to go inside and -- before they
20 could come back out and part of the thing was
21 is -- you know, you wash those hot particles
22 off the tops of trailers and stuff and when it
23 dries out, where did they go and so forth like
24 that. That was -- that was just one of my
25 things that I was a little bit nervous about.

1 I understand about the re-entry teams.

2 **MR. ROLFES:** Okay, that's -- for example, with
3 the Pluto reactor, I know we do have some
4 people on the phone that were involved in that
5 as well. The -- I -- I don't off the top of my
6 head have the information if there were in fact
7 potential hot particle exposures. But once
8 again, there may have been fission product
9 exposure potential from that reactor.

10 **MR. CLAWSON:** Maybe that's more what I'm
11 (unintelligible) at because they were -- they
12 were talking about that the -- before that they
13 could even come out of these trailers, which
14 had air -- air being pulled into them, which
15 they found kind of a little bit interesting,
16 but that they all had to be washed down and
17 stuff like that because of -- and I guess
18 possibly that's what it is, part of the fission
19 product.

20 **MR. ROLFES:** Bob, do we -- do we have any ORAU
21 people on the line that might be able to
22 comment on this?

23 **DR. MAURO:** That would be -- be -- Mark, I do -
24 - I do want to hear they -- that response, but
25 I'd like to also set another perspective that I

1 think is -- as we go through this process.
2 This is a very important discussion now, and
3 I'll tell you why I believe that. In effect,
4 what I'm hearing is that the sce-- the scenario
5 where a person might leave a site and have some
6 particulate -- a part-- hot particle
7 contamination on his hands, face or any pos--
8 possibly other parts of his body, on his
9 clothing, is really not a scenario that could
10 occur. I mean in effect -- tell me if I'm
11 interpreting what I heard you say correctly.
12 That scenario can't really occur because -- so
13 that anyone that let's say comes down with a
14 skin cancer and has a claim for that --
15 **MR. ROLFES:** Uh-huh.
16 **DR. MAURO:** -- what I'm hearing is that on-- it
17 is not possible that that skin cancer was
18 caused by a hot particle because you know --
19 because the controls were in place to avoid
20 having a person having a hot particle deposited
21 on him and him leaving the site with that hot
22 particle, it's -- because I think that's what
23 effectively you're saying. And it really does
24 away with the possibility that that scenario is
25 really one that could have resulted in a skin

1 cancer. I -- I know I just drew a very broad-
2 brush conclusion, but that's what I heard.

3 **MR. ROLFES:** Well, true. In addition, if an
4 individual is diagnosed with a skin cancer, in
5 order for the hot particle to be of dosimetric
6 importance to that individual, that hot
7 particle would have had to have been deposited
8 in the exact location that the individual's
9 skin cancer was diagnosed.

10 **DR. MAURO:** That's correct.

11 **DR. MAKHIJANI:** Now what happens when you don't
12 know where the hot particle was lodged?

13 **DR. MAURO:** But Arjun, what I'm hearing is that
14 can't happen.

15 **DR. MAKHIJANI:** Oh.

16 **DR. MAURO:** You see, the position is that sites
17 where there were hot particles, such as these
18 rocket test sites and other sites, are known
19 and were known at the time that they had a hot
20 particle potential. And as a result, the
21 access and egress controls was such as to
22 preclude the possibility that a person would
23 receive direct contamination on his skin from
24 the hot particle, and -- and after -- after
25 going through -- exiting the site, there was a

1 the -- the decon process that would confirm
2 that he's not walking off-site with any -- any
3 -- any screamers, let's say, on his skin or
4 something -- some strong beta emitter on his
5 skin. And if that's the case and that's the --
6 and -- and you feel confident with that, that --
7 -- that's fine. But I think it's important that
8 -- what I heard is that that scenario really
9 can't happen and so therefore we're not going
10 to have a circumstance where a person later on
11 with a skin cancer could claim that well, the
12 skin cancer was because of a hot particle.

13 That's really off the table now.

14 **MR. ROLFES:** The probability of an undocumented
15 exposure is so minuscule in such a scenario for
16 an individual that was not directly involved
17 with the test. I have documentation in front
18 of me regarding ground particulate
19 contamination and the number of particles
20 produced per 100 square feet in relation to
21 test cell A at the Test Site, and I believe
22 this was area 25. There's survey information
23 with radiation levels and the number of
24 particles within a given area surrounding the
25 test cell. And -- let's see -- the highest

1 documented number that I have in the closest
2 position to the test cell for this particular
3 test was 22 particles per 100 square feet. As
4 the distance increases, it quickly drops off.
5 That was the single highest value. The great
6 majority of these values that are documented
7 here are less than one particle per 100 square
8 feet.

9 So because of the access controls surrounding
10 these tests, it's very unlikely that an
11 individual would have been exposed to a hot
12 particle or been in an area when a test was
13 conducted, or following the test, other than
14 individuals that were directly associated with
15 radiation monitoring.

16 **DR. MAURO:** You know, if in fact the case is
17 made that that scenario where a person's skin
18 cancer really could not have been due to an
19 undetected hot particle, and you have -- you
20 know, what I'm hearing is you have a -- a lots
21 of analysis and evidence that that in fact is
22 the case, that's an important conclusion 'cause
23 it really goes toward, interestingly enough,
24 the resolution of a concern we have on OTIB-17
25 and -- and I think that -- this -- this

1 decision, this judgment that -- that we're
2 making here has far-reaching implications and
3 is very important. And I'm not saying that's
4 not the right judgment, but I -- I would I
5 guess alert everybody on the phone that I see
6 it as a very important deci-- judgment and that
7 will have far-reaching implications across the
8 complex.

9 **MR. PRESLEY:** This is Bob Presley. I don't
10 really know what to say except we have -- or
11 NIOSH has gone back and looked at all the data
12 and have probably hundreds of thousands of
13 samples where they did actually go in and check
14 the people as they egressed the areas after
15 this. Is this not correct, Mark?

16 **MR. ROLFES:** Yes, that's correct. The
17 individuals that were involved in re-entry were
18 in fact monitored and frisked on the exit of
19 the area.

20 **MR. PRESLEY:** Okay. Then do -- how many people
21 -- do we know that if -- say how many of these
22 people have filed for compensation or if -- or
23 -- or not? I don't know whether that would
24 have any bearing on this or not, but I -- I
25 think we could say that with -- you never can

1 say without a shadow of a doubt, but you know,
2 within the best scientific field, we can say
3 that all was done to make sure that these
4 people didn't have hot particles and that if
5 there was, somebody picked up one down the
6 road, you know, we should know about it.

7 **MR. ROLFES:** The likelihood of someone picking
8 one up down the road is very, very unlikely --

9 **MR. PRESLEY:** That's correct.

10 **MR. ROLFES:** -- and then there's just no -- no
11 credible exposure scenario that I could think
12 of where this could have occurred, just because
13 of the very low number of hot particles
14 downwind of the test area, very low number of
15 people that would have been downwind of the
16 test, and the very -- because -- because these
17 particles are very radioactive, that means that
18 they decay very, very quickly. And so if
19 you're not in the area within that day or two
20 following that test, those particles were not
21 going to exist any longer. They decay very
22 quickly and that's why they are so radioactive.

23 **MR. PRESLEY:** Okay.

24 **DR. MAKHIJANI:** Mark, this is Arjun. Are we
25 taking the tunnel re-- comments two and three

1 and tunnel re-entry and atmospheric and reactor
2 workers all in the same comment, or are we
3 separating them? I just -- just so I'm not
4 commenting on something we're not -- that's not
5 on the table.

6 **MR. ROLFES:** Let's see here, what I've been
7 speaking to right now was related to the RDS --

8 **DR. MAKHIJANI:** Yeah, right, I thought so.

9 **MR. ROLFES:** -- and that was comment two.

10 **DR. MAKHIJANI:** Right, okay. But the same --
11 same comments apply -- you know, your same
12 responses -- I thought you gave a common
13 response to points two and three, comments two
14 and three.

15 **MR. ROLFES:** Oh, okay, let me --

16 **DR. MAKHIJANI:** I just wondered whether the
17 position -- I just wondered whether the
18 position was that tunnel -- early tunnel re-
19 entry workers could not have had any hot
20 particle or that they were always monitored on
21 -- on -- on exit.

22 **MR. ROLFES:** Let me see here, I'm taking a
23 look. Well, the -- the Nuclear Rocket
24 Development Station parameters would not be
25 applicable to dose estimates for workers

1 associated with drill-backs -- well, if we'd
2 like to get into that, we can go ahead and
3 proceed with number three, if that's what
4 you're asking, Arjun.

5 **DR. MAKHIJANI:** No, I was just asking whether
6 all the comments were -- to two and three and
7 you said they were in relation to two, so I'm
8 happy to hold.

9 **MR. ROLFES:** Well, that's what I'm saying, we
10 can move on to comment three if you'd like, if
11 that's what --

12 **DR. MAKHIJANI:** Well, what-- what--

13 **MR. ROLFES:** -- I was speaking to comment two.

14 **DR. MAKHIJANI:** -- whatever Mr. Presley --

15 **DR. MAURO:** Am I correct that really the
16 arguments are about the same, though. You have
17 VARSKIN available to you if it's -- and if it
18 turns out in case that you -- you believe that
19 there might be a problem here, but the
20 likelihood that such a scenario actually
21 occurred and had gone on undetected at the time
22 is virtual -- a -- virtually zero --

23 (unintelligible) it's extremely small. And I
24 think it's important, whether we're talking
25 about the ro-- the engine -- rocket engine test

1 or we're talking about underground tests at
2 Nevada Test Site or at other sites. You know,
3 the basic I guess view of this as being an
4 issue is -- is being addressed right now in
5 this setting. I think it's important. And I'm
6 not saying that you -- you don't have your ar--
7 your case right. I mean it may turn out that
8 this concern that's in OTIB-7-- that we raise
9 regarding OTIB-17 is in fact really a non-issue
10 because of the controls that are in place and
11 the probability that -- I think your argument
12 also is the probability that just so happens if
13 the particle, you know, is responsible for
14 that, it landed undetected, was there long
15 enough and delivered a high enough dose that it
16 would in fact be the cause of a skin cancer.
17 So I -- I -- I know we're trying to focus in
18 and resolve the issue here as it applies even
19 to the tunnel workers in -- in number three or
20 in the rocket engine tests in number two, but
21 the judgment's got to be made right now -- I'll
22 say it again, are -- will have applicability to
23 OTIB-17 and to many other places where we're
24 addressing hot particle issues, which includes
25 Hanford and other -- other sites.

1 **DR. ANSPAUGH:** Well, this -- this is Lynn
2 Anspaugh and I'd like to just comment that I
3 think you're being a little optimistic. These
4 -- the project (unintelligible) for example
5 went on for 11 years and it's not clear that
6 they had this (break in transmission) model--
7 monitoring in place in the early days, but
8 there was one test that released 250,000
9 curies, some of which was easily detected off-
10 site, so I -- I think there may not be a
11 generic statement that you can just neglect
12 this.

13 **MR. ROLFES:** Well, Lynn -- this is Mark Rolfes
14 -- and what we are speaking specifically to are
15 hot particle exposures. We do acknowledge that
16 radioiodine, other radioactive noble gases,
17 were released, other radioactive halites were
18 released. That -- that is not contested at
19 all. We certainly acknowledge that and we do
20 assign doses from potential exposures to
21 personnel. What we are speaking specifically
22 to is production of hot particles and potential
23 undocumented exposures to individuals.

24 **DR. ANSPAUGH:** That's what I am speaking to,
25 too, and when you're in Las Vegas I'd like to

1 show you a movie of how one of these reactors
2 blew up.

3 **MR. ROLFES:** Yes, the Kiwi TNT test. Is that
4 the one you are referring to?

5 **DR. ANSPAUGH:** I'm -- I'm not sure. I don't
6 recall all of them by name. I --

7 **MR. ROLFES:** Well, yeah, I certainly would be
8 interested in seeing that, Lynn.

9 **DR. ANSPAUGH:** Okay.

10 **MR. CHEW:** Mark? Hi, this is Mel.

11 **MR. ROLFES:** Yes.

12 **MR. CHEW:** I just want to address Brad
13 Clawson's comment. Brad, you were correct.
14 There are two maj-- there were two major
15 programs at the Nevada Test Site for the rocket
16 development. One was Project Rover and what
17 Lynn just talked about, and the other one was
18 Project Tory* -- the -- Pluto, and the first
19 reactor that the -- after Pluto was the Tory
20 reactor and I happened to be, just by -- dates
21 me right now -- was on the initial re-entry
22 team to look at the nozzle of the reactor and
23 the reactor stayed very much intact, and so
24 what he was talking about was probably the
25 mixed fission product from the Tory 1-A and the

1 Tory 2-A reactor experiments here. What Lynn
2 is talking about is the Project Rover, which is
3 the Kiwi reactors and Los Alamos experiments
4 here, and they were separated from the sites by
5 a few miles here. Just want to set the record
6 that there was two programs here, Pluto and
7 Rover.

8 **MR. ROLFES:** Yes, and Mel, this -- I would like
9 to add also that we do have documentation of
10 the environmental effects of the Kiwi TNT
11 effluent, and this is a Los Alamos Scientific
12 Laboratory document -- I'm trying to find the
13 date -- but this reviews and evaluates the
14 information regarding the test. The report is
15 dated January 1968 and was distributed in April
16 1968. There is information on radiation
17 surveys, et cetera, following the test and --
18 let's see, this is a 68-page report that we
19 have, Los Alamos 3449.

20 **MR. CLAWSON:** Hey, Mark, this -- this is Brad,
21 and I don't want to show my ignorance or
22 anything else like that, but when we're talking
23 about hot particles, this is -- this is still
24 part of the fission products or -- or am I
25 wrong in that?

1 **MR. ROLFES:** No, that's correct, these are
2 short-lived fission products that are
3 responsible -- fission and activation products
4 that would be responsible for -- yes, it's --
5 it's short-lived fission products and
6 activation products.

7 **MR. CLAWSON:** Well, and -- and I appreciate Mel
8 chiming in on that because if -- if you
9 remember right when we were in Nevada last time
10 down there, we had some of the petitioners
11 talking about these propulsion systems --

12 **MR. ROLFES:** Uh-huh.

13 **MR. CLAWSON:** -- and they weren't part of the
14 re-entry team. And this is -- this is where
15 some of this is coming from, but they were I
16 guess -- be able to use the term downwinders or
17 -- or whatever that -- like that that we're
18 getting from this product, and that was my only
19 concern, that -- I know that the re-entry teams
20 were watched very well, but I was worried about
21 the outside areas and so forth like that.

22 **MR. ROLFES:** Sure, okay. All right. For the
23 people in the outside areas, the -- excuse me,
24 the hot particle exposure potential is -- is
25 very, very low. That -- however, the people

1 that are farther away could potentially be
2 exposed to gaseous, volatile radionuclide
3 releases such as radioiodine exposures, radio--
4 let's see, I believe krypton -- and there are
5 some other radionuclides that were associated
6 with some of those tests. As we understand --
7 we did speak with a health physicist that was
8 directly involved with some of these tests, and
9 there were mechanisms that were used -- I
10 believe they were called "frogs" -- and they
11 were essentially containment caps to prevent --
12 following the reactor test to prevent the
13 continuous venting of fission products or
14 gaseous fission products from the reactors.
15 If we have Billy on the line, did -- did I get
16 that correct? They were "frogs" I believe?
17 **MR. SMITH:** Yes, that was the description that
18 Bruce gave us.
19 **MR. ROLFES:** Yes.
20 **MR. SMITH:** I was not involved in those tests
21 personally at that time because that was before
22 my time, but --
23 **MR. ROLFES:** Okay.
24 **MR. SMITH:** -- but that is what the person who
25 was in charge of the health physics program at

1 NRDS at that time, that also operated the
2 whole-body counter --

3 **MR. ROLFES:** Yeah.

4 **MR. SMITH:** -- indicated.

5 **DR. ANSPAUGH:** And who is Bruce, Billy?

6 **MR. SMITH:** Who is who?

7 **DR. ANSPAUGH:** Who is Bruce? You mentioned
8 Bruce; is that correct?

9 **MR. SMITH:** No, I didn't mention Bruce, but --

10 **DR. ANSPAUGH:** Sorry.

11 **MR. SMITH:** -- we -- we -- we did interview a
12 person who was in charge of the health physics
13 program during the time that some of the
14 nuclear rocket development tests were going on
15 at NRDS and he was indicating the degree of --
16 of hot particle contamination, both on the
17 ground and on the fallout trays and the -- the
18 control programs that were involved in people
19 that made re-entries and that were up-wind of
20 the testing activities when they took place.
21 No persons, as I understand it, in the
22 controlled areas -- which was -- the NRDS was
23 the controlled area -- were downwind of a test
24 as it took place, regardless of the outcome of
25 the test, other than people that may have been

1 off-site. That -- that interview I believe is
2 on the O drive. Is that right, Mark?

3 **MR. ROLFES:** That's correct, and it has been
4 provided to the Advisory Board members as well,
5 so...

6 **MR. PRESLEY:** Mark, this is Bob.

7 **MR. ROLFES:** Yes.

8 **MR. PRESLEY:** Also, the Test Site had a large
9 number of personnel that just as soon as
10 something was over always went out and checked
11 the area, even on-site and off-site. That was
12 one of the reasons that they did plume studies,
13 so that they would know where to go back and
14 check after a -- after a release or a shot.

15 **MR. ROLFES:** Correct, there was monitoring done
16 both on-site and off-site. The -- the United
17 States Public Health Service was in charge of
18 off-site monitoring and did in fact track any
19 potential releases or effluents from the site
20 as well, so...

21 **MR. PRESLEY:** That's correct. Is everybody --

22 **MR. SCHOFIELD:** Just one quick question -- this
23 is Phil. That -- the monitoring was really the
24 same for both the NRDS and the Project Rover?

25 **MR. ROLFES:** They -- the Nuclear Rocket

1 Development Station, I believe the Rover tests
2 were conducted within area -- in the same area.

3 **MR. SCHOFIELD:** Okay, but the same rules and
4 safeguards were handled in both the two
5 different projects the same. Is --

6 **MR. ROLFES:** Yes.

7 **MR. SCHOFIELD:** -- this what I understand to be
8 correct?

9 **MR. ROLFES:** Yes.

10 **MR. SCHOFIELD:** Okay.

11 **MR. ROLFES:** Yes, that's affirmative.

12 **MR. PRESLEY:** Yeah.

13 **DR. MAURO:** Hey, Mark, this is John. I -- I --
14 I think that -- what I -- what I'm hearing is
15 that on -- on I guess a case-by-- not a case
16 but a site-by-site or operation-by-operation
17 basis, in effect you're in a position to make a
18 statement that says well, at least in these
19 circumstances there's plenty of evidence that
20 we -- you know, there was controls in place for
21 access and egress and for -- for where people
22 were down-- whether they were up- or downwind
23 so that you -- you had the controls in place so
24 that really the -- the people in the vicinity
25 of the -- the activity, the operation or the

1 test, were -- were adequately protected from
2 hot particle exposures and also, because of the
3 -- these -- it sounds like that there were
4 sticky-tape -- I forget what you -- those
5 plates --

6 **MR. ROLFES:** Fallout trays.

7 **DR. MAURO:** -- fallout trays --

8 **MR. ROLFES:** Uh-huh.

9 **DR. MAURO:** -- that you have pretty good data
10 that says on the number per meter squared or
11 per hundred square -- square meter of these
12 particles that may have deposited as a function
13 of distance, so in this circumstance you could
14 really rule out that anyone could realistically
15 have experienced a hot particle exposure on --
16 on skin that could have resulted in a skin
17 cancer. Perhaps that line of argument with its
18 associated documentation will need to be made
19 every time we have a site or operation where
20 hot particles are of concern, and so -- and --
21 and that's what I'm hearing, that the argument
22 is here. That is, you have the evidence, the
23 records, that show that there was controls in
24 place that would effectively eliminate this as
25 a plausible scenario for both workers who were

1 on-site and perhaps people who may have been
2 off-site somewhere downwind.

3 **MR. PRESLEY:** That -- this is Bob Presley.
4 That's what I see.

5 **DR. MAURO:** Okay. Well, if that's the case and
6 the case is made, and your -- your review of
7 this work, at least in the case of Nevada Test
8 Site and -- and the rocket program and tunnel
9 re-entry, I -- I think after -- that -- if
10 that's the strategy that you've adopted -- now
11 Arjun, to what extent did we -- have we looked
12 at that information? That is the records
13 regarding access and egress controls and this
14 deposition of hot particles as a function of
15 distance from these different operations. Have
16 we looked at any of that?

17 **DR. MAKHIJANI:** No, John, this is -- this is
18 new information. You know, we've reviewed new
19 external dose site profile and made this
20 comment and -- and NIOSH's response a few days
21 later was to provide this information but we've
22 not gone back and looked at it.

23 **DR. MAURO:** Okay. Well, I would -- I would say
24 -- I mean this is SC&A speaking as that -- the
25 concept, the strategy that is outlined as --

1 that -- described by Mark is conceptually
2 powerful and valid. However, you know, the
3 degree to which those controls were in fact in
4 place and then -- and the data does in fact
5 support that conclusion, we really haven't had
6 an opportunity to review. And I also would
7 like to say that if such a strategy is taken at
8 other sites, it's -- go to -- this -- this is
9 an important precedent is what I'm getting at,
10 is that on a case-by-ca-- on a site-by-site
11 basis if such controls and data are available
12 that could put this issue to bed, this is the
13 way it can be done. But it -- you know, and it
14 sounds like we're pretty close to putting this
15 issue to bed, at least at the Nevada Test Site.
16 However, we -- we haven't looked
17 (unintelligible) -- and what I would say is I
18 think the strategy is valid and -- but we have
19 not of course looked into the -- gone into the
20 trenches and looked at the data itself.

21 **MR. PRESLEY:** Well --

22 **MR. ROLFES:** Now --

23 **MR. PRESLEY:** Go ahead.

24 **MR. ROLFES:** I -- I do want to caution everyone
25 that if, for example, we would see an

1 individual telephone interview report from a
2 claimant, if we had information that an
3 individual was exposed to hot particles or a
4 hot particle and had information within their
5 claim file, then that would certainly be
6 considered in their dose reconstruction. So
7 just because the information -- because based
8 on our review we haven't found any indication
9 of, you know, a widespread issue, that does not
10 mean that we're not going to still consider
11 this in dose reconstruction.

12 **DR. MAURO:** Oh, okay, so -- then -- let's say
13 we have a -- a claimant for skin cancer and in
14 his CATI interview there is information that he
15 had to be decontaminated, upon egress he was
16 found to have contamination and went through
17 decontamination. What would you do at that
18 point in terms of specifically addressing dose
19 reconstruction to that person? Would you
20 assume that some hot particle did in fact
21 deposited on the location where -- let's say it
22 was on his face -- where the skin cancer was
23 observed and do -- and assign to that -- that
24 that dose to that location or would you somehow
25 average it over his whole body?

1 **MR. ROLFES:** That would be a policy decision.
2 However, the dose -- as you are aware, the dose
3 to the skin -- we are calculating doses based
4 upon the entire -- entire mass of the skin.
5 That I know has been discussed previously and I
6 think that Jim Neton would probably be best to
7 answer that question as a policy decision,
8 so...

9 **DR. MAURO:** Okay. I -- I mean what are -- did
10 -- it sounds like then you do provide for doing
11 that type of dose calculation. I just could --
12 not quite sure how you connect the -- a VARSKIN
13 dose calculation to let's say a localized, one-
14 centimeter square area of the skin to the dose
15 to the -- to the skin that's used for the
16 purpose of probability of causation, but maybe
17 that's a -- that's a separate subject.

18 **MR. ROLFES:** One of -- one of the most
19 important things, I'll reiterate, is that for
20 an individual that would have a skin cancer on
21 their face and had a hot particle exposure, we
22 would have to first make sure that the
23 individual's skin cancer and hot particle
24 exposure occurred to the same area.

25 **DR. MAURO:** Okay, I understand. Okay.

1 **MR. ROLFES:** The individual's hot particle
2 would have had to have been deposited on the
3 same area that developed cancer in order for
4 that to become a significant issue.

5 **DR. MAURO:** Okay, so you don't just
6 automatically assume that yes, exposed to hot
7 particle; yes, skin cancer; we're going to
8 assume that hot particle landed right where the
9 skin cancer originated.

10 **MR. ROLFES:** In a worst-case scenario, one
11 could simply do that. However, based upon the
12 facts of the case, if -- if that was the only
13 information that we had indicating in -- in the
14 file, for example, in the DOE dosimetry file, a
15 blank statement saying a hot particle was
16 deposited on this individual's skin and he was
17 successfully decontaminated, say for example
18 two hours after the exposure, we could do a
19 worst-case scenario and assume that that hot
20 particle was in fact deposited on the single
21 location where the individual's skin cancer was
22 diagnosed years later.

23 **DR. MAURO:** And -- and let's say you get a --
24 you got a probability of causation above .5,
25 would you go back and redo it and do a --

1 something which takes into consideration the
2 probability that that particle actually landed
3 where it -- the worst possible place? In other
4 words, I could see you using that approach as a
5 maximizing approach for denial. Would you --
6 but if you wanted to -- if you found that you
7 couldn't deny on that basis, would you -- are
8 there other -- I guess I'm not familiar -- are
9 there other procedures for how you would deal
10 with that?

11 **MR. ROLFES:** One would have to take a look at
12 the facts of the case and simply -- there's too
13 many facts and too many different parameters
14 that would need to be considered. First of
15 all, you know, some of the most important
16 pieces of information would likely be contained
17 within the individual's dosimetry files, and
18 that would be our first place where we would
19 look in more detail. We would also take a look
20 at some of the on-site rad safety reports and
21 look at some of the areas that the individual
22 was working in. There's just so many
23 parameters that would be involved that we would
24 have to take a look at and analyze in more
25 detail.

1 **MS. MUNN:** I think what John said early on was
2 very important with respect to making the case
3 for adequate administrative oversight for many
4 of these kinds of cases. It's been a long time
5 since I read the entire document, and I do not
6 recall -- Mark, can you tell us whether our --
7 our site description actually has any wording
8 in it regarding the extent of monitoring and
9 oversight that was given to these individual
10 tests? Do we have adequate wording in there?

11 **MR. ROLFES:** Whether the site profile has
12 wording on the oversight of each test?

13 **MS. MUNN:** Well, you recall as -- as John was
14 saying, if the case has been made adequately
15 that we do in fact have the kind of monitoring
16 and the kind of individual oversight of each of
17 these projects that we can say with a high
18 degree of certainty that it's unlikely that hot
19 particles would have been missed, then it's --
20 it's important for us to -- to see that that
21 wording gets in the base document. I just
22 don't know if it's there.

23 **MR. ROLFES:** I would have to go back and take a
24 look. What I am referring to that I have been
25 referencing are several on-site radiological

1 safety reports associated with each specific
2 test. For example, I can just read a couple of
3 the titles of them. One was the on-site rad
4 safety report for the Nirva* test operations,
5 NRX-A4. Another was Tory 2A operation, let's
6 see -- see, additionally the environmental
7 effects of the Kiwi TNT effluents.

8 **MS. MUNN:** And you feel there is wording in
9 those specific documents that gives us the
10 confidence that we need --

11 **MR. ROLFES:** Yes.

12 **MS. MUNN:** -- with respect to hot particles?
13 Now -- and are they -- is that fact
14 appropriately referenced in the site profile,
15 and should it be? I guess that's the real
16 question.

17 **MR. ROLFES:** I'm going to ask Gene Rollins to
18 comment as to whether -- what level of detail
19 we have put into our site profile documentation
20 regarding the monitoring (unintelligible) --

21 **MS. MUNN:** I'd appreciate that because I simply
22 don't remember.

23 **MR. ROLFES:** Okay. Gene, do you happen to have
24 that language in front of you? I know you
25 probably are most familiar with it as of late.

1 Do you have a feel for what level of detail we
2 have put into the site profile regarding
3 monitoring and potential exposures at the
4 Nuclear Rocket Development Station at Nevada
5 Test Site?

6 **MR. ROLLINS:** Mark, I -- I don't think we have
7 put a lot of text into the document regarding
8 this particular issue.

9 **MS. MUNN:** I wouldn't think it would need to be
10 a lot of text. I just think we need to be very
11 specific here essentially, since our technical
12 contractor is saying to us you need to tell us
13 if you've done that.

14 **MR. ROLLINS:** And -- and Wanda, what -- what
15 you would like -- what you might expect to see
16 would be a discussion as to the radiological
17 controls that were used for these tests?

18 **MS. MUNN:** A paragraph indicating that the
19 information that's necessary exists and citing
20 the reference. That would appear to be
21 adequate to me. Is that your view, John?

22 **DR. MAURO:** Yes, to me -- I think you're hot on
23 the trail of resolving what I consider to be
24 one of the lingering issues. And if in fact
25 documentation exists that those types of access

1 and egress controls were in place at the time
2 of these -- at least in these case, these
3 experiments, or when it came to access and
4 egress to the tunnels, then that type of
5 documentation would go a long way to resolving
6 this issue.

7 **MS. MUNN:** That's very important and it has
8 ramifications on other sites.

9 **MR. ROLLINS:** And in addition to that, we also
10 have documented an interview with the health
11 physicist in charge with these controls about
12 his direct experience. Maybe some of that
13 would also be appropriate to put in there?

14 **MR. ROLFES:** I certainly think that would, if
15 we haven't mentioned it. I know that we have
16 detailed this within our Special Exposure
17 Cohort evaluation report that --

18 **MS. MUNN:** Yes.

19 **MR. ROLFES:** -- has been released.

20 **MS. MUNN:** But people don't see all the
21 documents.

22 **MR. ROLFES:** Sure, exactly. If it isn't in one
23 document, it may be in another. But -- let's
24 see --

25 **MS. MUNN:** If the site profile's going to be

1 our basic document, that's the best place for
2 at least the indication that the information
3 exists.

4 **DR. MAURO:** And I would take it a step further.
5 When -- when you are concerned, as you had
6 mentioned earlier that maybe there is a hot
7 particle exposure that -- let's say in the
8 person's records from a CATI interview or what-
9 - whatever, and that you do -- if there's any -
10 - right now I guess I haven't seen the guidance
11 on okay, how do we do the dose -- you know, the
12 dose reconstruction for this person when we are
13 going to attribute to him some hot particle
14 exposure. In this case I would assume that
15 that would apply to either skin cancer or
16 perhaps a breast cancer or -- or testic--
17 testicular cancer. You know, those cancers
18 which theoretically could -- where the beta
19 particles could find their way to the target
20 organ. Is there -- I -- I have to say, it --
21 the -- the subject of using VARSKIN and the
22 results of VARSKINs to what the dose would be
23 likely, and then translating how you use that
24 information in the dose reconstruction, I --
25 I'm not familiar with that. You may already

1 have something on that, but I -- I -- I haven't
2 read it.

3 **MR. ROLFES:** Well, the likelihood that an
4 individual would receive a significant dose
5 from a hot particle deposited on their skin or
6 on their anti-contamination clothing to any
7 organ other than the skin is very, very
8 unlikely and just another additional thing that
9 would reduce the likelihood of such an
10 exposure. Keep in mind that individuals that
11 would have been potentially exposed to hot
12 particles were dressed in anti-contamination --
13 double anti-contamination clothing, as well as
14 respirators, gloves, protective clothing, and
15 were monitored following re-entry.

16 **DR. MAURO:** Oh, no, no, and -- and I -- I agree
17 -- that goes toward the access/egress controls
18 that -- that the scenario can't happen.

19 **MR. ROLFES:** Yeah.

20 **DR. MAURO:** But I did hear you say, though,
21 that under those occasions when there was a --
22 a -- a person was on a -- I guess on egress
23 where it was determined that he -- there was a
24 problem and he had to be decontaminated, that
25 there are circumstances when you would run

1 in there to take care of -- of rad con-- to
2 address the rad controls, and also I want to
3 note that we are waiting for the internal
4 documents from NIOSH.

5 **MR. ROLFES:** That's correct, these -- and
6 you're referring to the site profile document -
7 -

8 **MR. PRESLEY:** Uh-huh.

9 **MR. ROLFES:** -- Technical Basis Documents --

10 **MR. PRESLEY:** That's correct.

11 **MR. ROLFES:** -- that are in review.

12 **MR. PRESLEY:** So TBD, okay, and that is 00 --
13 is it 00 -- NTS-5, Revision 1 or 001?

14 **MR. ROLFES:** Let's see, it is NTS-5, Revision
15 00, Revision -- oh, okay, I'm sorry -- Revision
16 00 was the approved version. We are currently
17 almost ready to approve the final version of
18 Rev. 01 of NTS-5.

19 **MR. PRESLEY:** Okay, NTS-5. Okay, and we're
20 awaiting that. All right.
21 Anybody have a problem with that?

22 **MS. MUNN:** Sounds good.

23 **MR. PRESLEY:** Okay. When can we expect the
24 verbiage? Can -- can we have a rough draft of
25 this verbiage before we go to Nevada?

1 **MR. ROLFES:** Mr. Presley, this is Mark. We
2 have documented this in a formal communication
3 with the health physicist associated with the
4 Nuclear Rocket Development Station. I don't
5 foresee any problems in referencing that report
6 or that documentation of communication in the
7 site profile, if that's necessary. However, I
8 -- I did want to remind everyone that this
9 documentation is included in the site research
10 database and does serve as an official project
11 document that can be referenced in a dose --

12 **MR. PRESLEY:** Okay, can --

13 **MR. ROLFES:** -- reconstruction.

14 **MR. PRESLEY:** -- can we put that in there,
15 Mark, please?

16 **MR. ROLFES:** I cert-- I certainly can do so.
17 We can certainly do that.

18 **MR. PRESLEY:** Wanda, is that all right with
19 you?

20 **MS. MUNN:** That's fine, yeah.

21 **MR. PRESLEY:** Okay.

22 **MS. MUNN:** It's just that I think it's really
23 important that we have the -- the words where
24 they can be seen and referenced easily in the
25 future because we will need them.

1 **MR. PRESLEY:** Okay. Let's go on to comment
2 four. I think -- we have two and three on this
3 matrix, but I think we've already taken care of
4 those. Everybody agree?

5 **DR. MAKHIJANI:** We didn't address the tunnel
6 workers, which we started to. Or is -- is that
7 part of three? I don't remember. Let me just
8 --

9 **MR. ROLFES:** Well, that was mentioned --

10 **DR. MAKHIJANI:** No, it is not. I'm sor-- or
11 yes, it is part of three.

12 **MR. ROLFES:** Well, three was related to
13 atmospheric -- SC&A's comment on number three
14 was dose from large particles to GI tract and
15 skin for workers in atmospheric testing has not
16 been evaluated. Let's see, how do --

17 **DR. MAKHIJANI:** That -- that -- three also
18 talks about drill-back.

19 **MR. ROLFES:** Yes, correct. And I -- I hadn't
20 completed reading the comment here yet. It
21 said hot particle doses also need to be
22 evaluated for early drill-back and other re-
23 entry workers during underground testing
24 periods. And the -- excuse me, the NRDS
25 parameters are not -- not applicable to the

1 underground testing period. It's a completely
2 separate issue. But once again I'd like to
3 reiterate that any documented hot particle
4 exposures for individuals would be assigned in
5 a dose reconstruction based on information
6 documented by the DOE, such as a survey by an
7 individual -- excuse me, a survey of an
8 individual done by a radiation safety
9 technician following exit of a re-entry team.

10 **MR. PRESLEY:** That would have to do with any
11 re-entry team.

12 **MR. ROLFES:** Correct.

13 **DR. MAKHIJANI:** So Mark, is the position that
14 you also have documentation about -- similar to
15 the -- the reactor tests for tunnel re-entry
16 workers?

17 **MR. ROLFES:** I do have documentation that there
18 were survey procedures following re-entries
19 that would have detected any potential skin
20 contamination or potential exposures to
21 radioactive material associated with that re-
22 entry.

23 **DR. MAKHIJANI:** Okay. We -- we didn't see them
24 and -- let me see, I'm just trying to see what
25 we said in that regard. I guess -- I guess

1 that -- the position was the same, that -- that
2 we had no problem with the procedure, but
3 didn't see the documentation. So maybe you're
4 going to add that, too.

5 **MS. MUNN:** It would be helpful.

6 **MR. PRESLEY:** Mark, yeah, go ahead and add that
7 wording in there, too --

8 **MR. ROLFES:** Okay.

9 **MR. PRESLEY:** -- please, so we can cover
10 everything.

11 **MR. ROLFES:** Before -- before we go on there, I
12 would like to ask ORAU once again to make sure
13 that we don't already have something in there
14 so we don't get asked to do something that
15 we've already done. If someone could take a
16 look in the -- in the Technical Basis Documents
17 to see if we have any information regarding
18 exit surveys following tunnel re-entry.

19 **MS. MUNN:** Somehow I had thought we had
20 something in there, but I don't know what it
21 was.

22 **MR. ROLLINS:** This is Gene Rollins. I just
23 went through these documents and I -- I don't
24 believe that level of detail is currently in
25 there.

1 **MR. ROLFES:** Okay. All right. Well, we can
2 certainly add something into the site profile
3 to provide a little bit more detail following a
4 re-entry. I do have a couple of technical
5 documents here in front of me that I can read
6 into the record if you'd like, just the titles.
7 The first is a Lawrence Radiation Laboratory
8 general re-entry procedure for underground
9 nuclear events, CN-294, and this is dated
10 November 9th, 1961. I also do have a Reynolds
11 and -- Electrical and Engineering Company CNA
12 SNL re-entry document for day plus one
13 activities, and that is also available on the
14 site research database I believe at this time.
15 So what we can do is incorporate some of the
16 language from these documents and others into
17 the site profile to provide a -- a descriptive
18 -- some descriptive information regarding these
19 radiological control practices.

20 **MS. MUNN:** Wonderful. Again, I don't think
21 that description needs to be lengthy as long as
22 -- as long as the resource reference is easily
23 available.

24 **MR. PRESLEY:** Yes, and that's -- that's all I
25 see, Mark.

1 **MR. ROLFES:** Okay. Okay. All right.

2 **MR. PRESLEY:** This is Bob Presley. I have no
3 problems just --

4 **MR. ROLFES:** Okay, so we can put a couple of
5 statements in there and reference these
6 documents for --

7 **MR. PRESLEY:** That's fine.

8 **MR. ROLFES:** -- for -- okay, great.

9 **MR. PRESLEY:** Just do that. All right, is that
10 all right with everybody, all the working
11 group, please?

12 **MS. MUNN:** It is with me.

13 **DR. ROESSLER:** Okay.

14 **MR. SCHOFIELD:** Sounds good.

15 **MR. PRESLEY:** Okay.

16 **MR. CLAWSON:** (Unintelligible) with me.

17 **COMMENT FOUR: INGESTION OF NON-RESPIRABLE HOT**
18 **PARTICLES**

19 **MR. PRESLEY:** All righty, thank you. Let's go
20 on to comment four, ingestion of non-respirable
21 hot particles by reactor testing and nuclear
22 weapons testing workers needs to be evaluated.
23 Mark, do you want to comment on this, please?

24 **MR. ROLFES:** Yes, hang on just one second. I
25 am looking back at the -- let's see -- let's

1 see -- I was just looking back at our combined
2 comments two and three, and I did want to note
3 that we do have mention of dose reconstruction
4 for claimants who participated in the nuclear
5 rocket re-entries incorporated as a page change
6 into the revision of NTS-6 Rev. 1.

7 **MR. PRESLEY:** Okay.

8 **MR. ROLFES:** I looked over that before and I
9 apologize, and it appears that that was
10 documented in Section 6.5.1 and 6.5.2.

11 **MR. PRESLEY:** Okay.

12 **MR. ROLFES:** Okay. Number four, the --
13 regarding the ingestion of non-respirable hot
14 particles.

15 **MR. PRESLEY:** Uh-huh.

16 **MR. ROLFES:** All right. We -- this is the
17 individual that we spoke with, the health
18 physicist that oversaw the operations at the
19 Nuclear Rocket Development Station. He
20 indicated that no hot particle ingestion
21 occurred, to his knowledge -- or based on any
22 of the information that he had associated with
23 the monitoring following the events -- the re-
24 entry events. We believe that the status of
25 this is closed as well.

1 **MR. PRESLEY:** Okay. Now we talked about this
2 at extensive length. Arjun --

3 **MS. MUNN:** Yeah, we sure did. Was this -- this
4 was the one we had said there was new
5 information, newly unearthed reports to be
6 reviewed and an expanded OCAS response is -- is
7 -- is this -- is this the newly unearthed
8 reports that we had discussed (unintelligible)
9 --

10 **MR. ROLFES:** Many of the reports that we do
11 have are on-site radiological safety reports
12 for the specific nuclear rocket development
13 work that was done at the Test Site, and also
14 interviews with the health physicist that
15 oversaw the -- the radiation exposure potential
16 and controls of the site operations.

17 **MS. MUNN:** Sounds like a good expanded
18 response. Thank you.

19 **MR. ROLFES:** Okay, thanks.

20 **MR. PRESLEY:** Arjun?

21 **DR. MAKHIJANI:** Yeah, for this item four --
22 well, again, it's the same thing. It's in the
23 Chapter 5, Rev. 01, which we have not seen and
24 have not been asked to review.

25 **DR. MAURO:** And this is John, too. I -- in

1 effect, the case being made here is very
2 similar to -- we talked about before. There
3 are controls in place that would preclude a
4 person from inadvertently ingesting a hot
5 particle. But the last paragraph in your
6 response also goes on to say however, if for
7 some reason you decide that you would want to,
8 for example, calculate the dose to the lungs
9 from a hot particle -- we'll stick to the
10 internal right now -- as you say in your write-
11 up, in that paragraph, that you know, there are
12 methods to do that and you make reference to
13 this -- an NRDL report. Now, again I would
14 like to ask when -- when you're doing that --
15 this is exactly the same issue we talked about
16 before with the skin, but now we're talking
17 about a particle that might have been inhaled
18 or ingested that -- recognizing that the
19 controls are in place, that such a scenario
20 really can't happen, but you do acknowledge
21 that there may be certain cases, on a case-by-
22 case basis, where you'll need to address that
23 issue and use methodologies to derive those
24 doses, as you indicated in your write-up.
25 Again I would ask -- I'd like to know -- learn

1 a little bit more about how that's done. That
2 is, when you derive dose to the lung from a hot
3 particle, unlike -- you know, unlike an
4 external dose or inhalation of a -- of a -- of
5 a -- a plutonium, when a particle is
6 distributed throughout the lung and you go
7 through your standard dose reconstruction and
8 standard IREP method. In this case we're
9 talking about hot particles and I guess I'd
10 like to hear a little bit about how the dose
11 reconstruction's done and the probability of
12 causation, just like we talked about with the
13 skin.

14 **MR. ROLFES:** At this time the standard
15 biokinetic models would be used to interpret
16 bioassay data for estimating a dose to any
17 particular organ in which a cancer would
18 develop in the future. So right now at this
19 time we have nothing that would change,
20 essentially, on the interpretation of a
21 particular piece of either direct or indirect
22 radiobioassay.

23 **DR. MAURO:** It's a (unintelligible), so in
24 effect you're saying that if a chest count were
25 taken or a bioassay sample were taken and you -

1 - you saw a positive result --

2 **MR. ROLFES:** Uh-huh.

3 **DR. MAURO:** -- you would -- you just
4 (unintelligible) methods, IMBA, to determine
5 the dose to the organ of concern -- let's say
6 in this case the lung -- and there's be
7 business as usual. This would apply whether or
8 not there was reason to believe that that body
9 burden or what was inhaled was -- was just a --
10 a fume or a vapor or very -- you know, a one --
11 a -- very small particles or you ingest it and
12 possibly a -- now I'm not sure if you would
13 inhale I guess a hot particle. I don't even
14 know if that's a real scenario because the
15 particle would have to be --

16 **DR. MAKHIJANI:** No, it's not. We're talking
17 about non-respirable ingestion.

18 **DR. MAURO:** Okay, so this is -- okay, so the
19 reference to the lung here doesn't really
20 apply.

21 **DR. MAKHIJANI:** No.

22 **DR. MAURO:** I guess it would be more a GI tract
23 issue then.

24 **DR. MAKHIJANI:** Yes.

25 **DR. MAURO:** Okay. Then that goes to the GI

1 tract if -- I just wanted to make sure I
2 understand the position you're talking, and I'm
3 not saying that I agree or disagree with it,
4 I'm just saying that -- so you're saying that
5 if a person were in a circumstance where there
6 was a possibility where he might have ingested
7 a relatively large hot particle, you're say--
8 now I understand your argument is well, that
9 scenario isn't very realistic, but then you do
10 go on to say in the write-up that however, if
11 there is there is something in his records that
12 says that well, this might have occurred,
13 you're going to treat the -- that person -- you
14 know, let's say just use his bioassay data as
15 normal and reconstruct the dose, let's say to
16 his GI tract, the same way you would any other
17 person that had a positive bioassay or whole
18 body count.

19 **DR. MAKHIJANI:** Well, let me just make a
20 comment to what Mark said, is in this last
21 paragraph of item four --

22 **UNIDENTIFIED:** We haven't --

23 **DR. MAKHIJANI:** -- we haven't reviewed this,
24 I'm just responding to the last paragraph --

25 **DR. MAURO:** Me, too, yeah.

1 **DR. MAKHIJANI:** -- that doses could be
2 calculated based on the NRDS approach, or if
3 that information is not available on OCAS IG-
4 002, which is the IMBA EXPERT (unintelligible),
5 which is the normal way of doing dose
6 reconstruction for internal dose, I'm -- I'm --
7 on the face of it, from -- from having read the
8 Naval reactor documents, I'm not convinced at
9 all that these two methods are equivalent for
10 the GI tract. In fact, I suspect that they
11 would give you rather different answers for the
12 same parameters for hot particle ingestion.

13 **MR. ROLFES:** The -- the likelihood, once again,
14 of this occurrence is so, so minuscule, and
15 that hasn't been reiterated enough because the
16 number of people that were involved in these
17 re-entries were typically about ten. So in
18 comparison to the total number of individuals
19 that worked on-site at Nevada Test Site and
20 associated with a particular project where a
21 hot particle exposure could have occurred,
22 we've -- we've rapidly eliminated the -- more
23 than 99 percent of individuals that worked on-
24 site. This -- you know, we -- we're talking
25 about people that, once again, were in

1 respirators, so it's very unlikely that an
2 individual could have potentially ingested a
3 hot particle. Once again the bottom line is
4 that we have methods to assign dose based on a
5 -- a -- exposure, however unlikely it may be;
6 the methodology does exist.

7 **DR. MAKHIJANI:** Yeah, all -- all I'm saying --
8 I'm not -- I'm not commenting on whether it
9 would likely or not. All I'm saying is that
10 you have proposed two approaches for
11 calculating the dose for the same thing, and on
12 the face of it, I suspect that they're not at
13 all equivalents. That's all. If you ever have
14 to calculate a dose and -- and you try to do it
15 by these two methods, I don't think you'll come
16 up with the same number.

17 **MR. ROLFES:** Okay. And --

18 **MR. SMITH:** Mark -- Mark, this is Billy.

19 **MR. ROLFES:** Yes.

20 **MR. SMITH:** Arjun is -- is absolutely correct.
21 I've gone through the NRDL report in detail and
22 looked at the model, and actually gone through
23 sample calculations as to how an internal dose
24 would be calculated using the NRDL model --

25 **MR. ROLFES:** Uh-huh.

1 **MR. SMITH:** -- and the IMBA code is a much more
2 current code, you know, relying in ICRP-66 --

3 **MR. ROLFES:** 66 and 68, yes.

4 **MR. SMITH:** -- values. But yes, you would
5 probably get different numbers. And I'm sure
6 that if the case does occur, that the most
7 conservative (unintelligible) against the
8 higher dose would be applied to the particular
9 claimant to give him the benefit of the doubt.
10 There's no argument that the models are
11 identical. They are not identical. But -- and
12 we recognize that.

13 **MR. ROLFES:** Yes, we would certainly rely on
14 the biokinetic parameters associated with the
15 more recent ICRP models. However, there may be
16 technical parameters regarding potential
17 particle sizes, et cetera, and radionuclides of
18 concern in the other -- in the other reference,
19 such as the NRDL report that we're referring
20 to.

21 **MR. SMITH:** Yeah.

22 **DR. MAKHIJANI:** All I -- all I want to say is
23 that I -- I have some reservations about this
24 last paragraph.

25 **DR. MAURO:** Me -- me, too. Me -- I -- I feel

1 as if -- right now if I were asked to do a dose
2 reconstruction to a person that we have some
3 bioassay data, but we also have reason to
4 suspect that he may have ingested some hot par-
5 - hot particles that were relatively insoluble
6 and -- and they -- that could have lodged in
7 the GI tract, quite frankly I'm not sure how I
8 would do that dose calculation. Certainly I
9 don't think I would use the bioassay results to
10 predict what the dose would -- localized dose
11 might have been to the GI tract --

12 **MR. ROLFES:** Okay.

13 **DR. MAURO:** -- see -- see my -- it's the same
14 thing as the skin.

15 **MR. ROLFES:** Which insoluble hot particles
16 would you be --

17 **DR. MAURO:** I -- I -- no, no, I --

18 **MR. ROLFES:** -- referring to?

19 **DR. MAURO:** -- I don't know if that's a real
20 scenario. I mean I -- I'm prepared to accept
21 your position that that scenario is non-
22 existent, it can't occur because of the access
23 and egress controls, respiratory protection, et
24 cetera. And if that's the case, that's fine,
25 and you've made your case that that's the case

1 and this problem's put to bed. But if you do
2 say that well, we do acknowledge that there may
3 be certain cases, on a case-by-case basis,
4 where we're going to have to deal with this
5 problem, what -- and actually reconstruct the
6 dose to the GI tract from the -- the ingestion
7 of some insoluble hot particles. If that
8 scenario does make its way to a dose
9 reconstruction, it's not clear to me how you
10 would do that. And now whether or not we --
11 you need to specify that at this time for this
12 purposes or simply say that there are methods
13 available that we would draw upon and use the
14 ones most appropriate and make reference to
15 what those methods are, that may be sufficient.
16 But right now I just don't know what those
17 methods are.

18 **MR. ROLFES:** Okay. So if we had to complete a
19 dose reconstruction for an individual, a
20 hypothetical individual, that ingested a hot
21 particle, I think it would be more appropriate
22 to address that issue when we come to it rather
23 than trying to address something that has such
24 a low likelihood of occurrence --

25 **DR. MAURO:** Okay.

1 **MR. ROLFES:** -- right now.

2 **DR. MAURO:** And -- and -- and I --

3 **DR. MAKHIJANI:** It is in your -- it is in your
4 revised site profile. Right?

5 **MR. ROLFES:** What's that?

6 **DR. MAKHIJANI:** Well, I -- I'm just -- I'm just
7 looking at what's on the paper here. It says
8 addressed in NTS-5 Rev. 01, and I -- I think --
9 I think at the present time maybe -- maybe --
10 at least I would want to leave it right there
11 and just to react to this paragraph and say
12 that we have not reviewed --

13 **MR. ROLFES:** Okay.

14 **DR. MAKHIJANI:** -- Rev. 01, that's it.

15 **MR. PRESLEY:** Okay. Again, I think we have
16 talked about this and talked about it. Working
17 group, what's your wish on -- on comment four?

18 **MS. MUNN:** Well, this is Wanda. I'm prepared
19 to accept it. I'm a little concerned that we
20 don't have the revision to look at. That's --
21 you know, it's one of those things that we find
22 ourselves taking from time to time when we all
23 have time constraints and they don't fall out
24 in the proper order. I'm certainly willing to
25 accept the agency's statement that they have

1 **MS. ARENT:** As far as I can (break in
2 transmission) looking at it right here, it
3 looks verbatim.

4 **MR. ROLFES:** Okay.

5 **MS. MUNN:** So the words, dose reconstructors
6 may consider using the models and methods in
7 the NRDL report (break in transmission) this
8 information is available for NRDS workers,
9 internal exposures can be addressed through
10 OCAS IG-002 and the IMBA EXPERT codes.

11 **MS. ARENT:** Yes.

12 **MS. MUNN:** And is -- is that wording acceptable
13 to our contractor?

14 **DR. MAKHIJANI:** Well, Ms. Munn, as I said, the
15 last paragraph in that three-paragraph
16 statement --

17 **MS. MUNN:** Yeah.

18 **DR. MAKHIJANI:** -- I'm -- I'm uneasy about
19 because I don't think those two methods would
20 be equitable in results, and I don't -- and I
21 (unintelligible) that we -- we're not sure how
22 you would calculate that dose, so -- so
23 currently we're not comfortable with what's on
24 the page and haven't reviewed any of the
25 underlying reasoning.

1 **MR. ROLFES:** Okay. Keep in mind, Arjun, that
2 when we complete a dose reconstruction using an
3 individual's DOE response information -- for
4 example, when we interpret a whole body count
5 result, we have the options of using ingestion
6 or inhalation pathways as -- and additionally
7 injection or wound entry. So when we complete
8 a dose reconstruction we do consider all those
9 pathways, and there's nothing that prevents us
10 from -- you know, we wouldn't handle this case
11 any differently than any other case.

12 **DR. MAKHIJANI:** Well -- well, the -- the point
13 of the review when we wrote it in December 2005
14 was if you review the NRDL document, the --
15 it's quite persuasive that if such a thing did
16 happen that you would have to treat it
17 differently because you're -- you're producing
18 very high doses locally in a way that would not
19 be reflected necessarily in the way IMBA works,
20 especially for urinalysis. And that's why I'm
21 reiterating that -- that I'm uncomfortable with
22 this because the whole point of raising this
23 issue was that you would not pick up this kind
24 of internal dose in your normal dose
25 reconstruction.

1 **DR. MAURO:** You have to realize these -- the
2 dose to the GI tract from a particle that may
3 deposit in their -- the GI tract really should
4 be thought of as part of -- is not internal to
5 the body. It's -- in fact when I studied, you
6 know, physiology and anatomy, it's always a
7 good -- it's just a pocket that certainly --
8 that can -- it's like depositing on your skin.
9 It's no different. Other words, if you ingest
10 a particle that is relatively insoluble and
11 let's say -- let's say that scenario does
12 occur, it's the same exact problem as if it's
13 deposited on your skin and -- and -- and the
14 question is -- and -- and it's a -- as long as
15 you consider that the scenario is plausible and
16 you do have the wherewithal, the tools, the
17 methodologies to calculate the dose, and then
18 how you would use that dose to transfer that to
19 a probability of causation, and let's say there
20 are methods to do that, I -- I -- I'm not
21 familiar with them, but if there are methods to
22 do that and you're going to be adopting those
23 methods on a case-by-case basis, that -- that's
24 fine. But as Arjun pointed out, we -- we
25 haven't looked at any of that and we're not --

1 I -- I'm not familiar with it. It may be -- it
2 may be techniques that are well established in
3 the health physics community to -- to -- I know
4 we can do the dose using VARSKIN. I -- I'm not
5 going to -- I mean you could actually, in
6 theory, apply VARSKIN to the GI tract, say
7 listen, this particle of a certain dimension
8 and certain activity was ingested and deposited
9 someplace in the GI tract and you wanted to get
10 a dose rate, you could run VARSKIN there also,
11 in theory. But I'm more con-- I guess my
12 question goes okay, you just calculated this
13 very, very high dose to a very, very small area
14 in the GI tract and the person --

15 **MR. ROLFES:** Well --

16 **DR. MAURO:** -- does have GI tract cancer --

17 **MR. ROLFES:** Well --

18 **DR. MAURO:** -- I'm not quite sure -- what do
19 you do then?

20 **MR. ROLFES:** You need to --

21 **DR. MAURO:** To (unintelligible) probability of
22 causation.

23 **MR. ROLFES:** You need to be very careful about
24 making that statement because that particle is
25 not going to stop and reside in one location

1 for any significant amount of time.

2 **DR. MAURO:** Okay.

3 **MR. ROLFES:** Recall that as you ingest
4 something, it moves from your stomach after
5 about an hour --

6 **DR. MAURO:** Okay.

7 **MR. ROLFES:** -- and then moves into your small
8 intestine, into the -- I believe it's the
9 duodenum first, followed by the jejunum and
10 then into the ilium.

11 **DR. MAURO:** Yes.

12 **MR. ROLFES:** From there, after residence time
13 of about six to eight hours, I believe it's
14 moved into the large intestine and is moved
15 into the large intestine -- it -- it may reside
16 there for -- in between an hour and eight hours
17 and --

18 **DR. MAURO:** (Unintelligible)

19 **MR. ROLFES:** -- this entire time period that
20 this particle is moving through an individual's
21 digestive tract system, it is undergoing
22 radiological decay, and it is also being
23 shielded by materials --

24 **DR. MAURO:** Right.

25 **MR. ROLFES:** -- such as waters or solids within

1 the GI tract. So this particle is not being
2 deposited and residing within the GI tract. It
3 is continuously moving.

4 **DR. MAURO:** Okay.

5 **MR. ROLFES:** So it is not one localized area
6 that is being continuously exposed --

7 **DR. MAURO:** Okay, so I --

8 **MR. ROLFES:** -- through an ingestion.

9 **DR. MAURO:** -- I -- you know what, that's good.
10 I accept that. So in effect what you're
11 describing is a model of how you would go about
12 -- it certainly is not -- it's not -- it's not
13 IMBA. I mean it -- what you're saying is now --
14 -- we've got this particle that may or may not
15 be in contact with any given location as it's
16 moving through the system. I haven't thought
17 through the problem and I haven't seen it
18 written it up, but what you just des--
19 described to me certainly makes sense and there
20 probably is a way to come to grips with how
21 we're going to derive the doses, whether we're
22 talking about skin or talking about this
23 particle moving through the GI tract. And it
24 may turn out to be a -- a relatively
25 straightforward way of dealing with this. And

1 then once you do get some kind of dose, maybe
2 you come up with an average dose to the GI
3 tract as the particle passes through and the
4 bolus that it's associated with and the self-
5 shielding, so -- you would then of course --
6 then you have some estimate of the average dose
7 to the -- to the -- whether it's the stomach,
8 the esophagus or whatever different organ is
9 the organ of concern, you're saying that you
10 get a dose that way, not using IMBA nec-- I'm
11 not sure that IMBA would do this for you or
12 not, I'm not -- I'm not sure. And then from
13 there you can get a probability of causation
14 and so you're saying it is a tractable problem
15 and you have the wherewithal to do it.

16 **MR. ROLFES:** That's correct. It can be done
17 when necessary. And at this time we haven't
18 seen a case where this is -- has become
19 necessary.

20 **DR. MAURO:** Uh-huh, yeah.

21 **DR. MAKHIJANI:** Be -- be -- I -- I -- you know,
22 I -- John, occasionally have to -- we have to
23 do a public -- I -- I think, you know, if you -
24 - some people have looked at the Naval
25 Radiological Defense Lab document and maybe

1 some haven't --

2 **DR. MAURO:** I haven't.

3 **DR. MAKHIJANI:** -- and -- and there -- there is
4 a method specified in there, it's not necessar-
5 - it isn't the one that is specified in IMBA.
6 It's -- I don't see any one-to-one
7 correspondence, especially for using IMBA with
8 bioassay, to -- to do what that model does.
9 And all -- all I'm saying right now is that we
10 are in a position to say, and it's been
11 reaffirmed by -- by ORAU, is that these two
12 things are not equivalent and so the statement
13 that is in the matrix is not internally
14 consistent. How it should be modified or
15 whether it should be modified, whether the
16 working group wants us to review it and write a
17 memorandum on it or however, it is a question
18 of course that the working group should
19 address. But at this stage all we know is --
20 is -- is that that statement is internally not
21 consistent, or appears not to be consistent,
22 and -- and I think we should leave it at that
23 because we haven't even seen volume five.

24 **MR. SMITH:** This is Billy. Arjun is -- is
25 partially correct. I think what's not said in

1 this particular paragraph is that if people
2 ingest hot particles from the rocket testing
3 days -- because you need to be very careful in
4 how you use the models that are described in
5 the NRDL report, they are only -- that model is
6 only specific to hot particles from the rocket
7 test days.

8 **MR. ROLFES:** Correct.

9 **MR. SMITH:** IMBA itself can be used to
10 determine what the GI tract doses are from
11 other than NRDS tests, hence drill-backs and
12 tunnel re-entries. So you know, it comes down
13 to the dose reconstructor making the kind of
14 determination as to where did this guy work,
15 where did the hot particle come from, was it
16 NRDL rocket testing or was it Nevada Test Site
17 testing, and then they would choose the
18 appropriate model to apply. They don't have to
19 be consistent. We would just apply the
20 particular model from the source where the hot
21 particles came from.

22 **DR. MAKHIJANI:** Well, I -- I don't -- I only
23 partly agree with that, because the point that
24 was raised in our review is not that the test
25 workers face an identical situation to reactor

1 workers. Of course not, there were -- there
2 were different tests and different specific
3 physical situations. But that -- there would
4 be a similarity in that drill-back workers may
5 ingest non-respirable -- non-respirable
6 particles that contain short-lived
7 radionuclides and therefore may produce high
8 localized doses similar to what occurs with --
9 or what was postulated to be possible with the
10 reactor tests, not that it would be identical.
11 And under those circumstances, I think you'd
12 have the same problem with using IMBA compared
13 to -- because you've got significant localized
14 doses, maybe not as high as calculated in the
15 NRDL document, but significant.

16 **MR. PRESLEY:** Arjun, this is Bob Presley.

17 **DR. MAKHIJANI:** Yes, sir.

18 **MR. PRESLEY:** Your comments are noted.

19 **DR. MAKHIJANI:** Yeah.

20 **MR. PRESLEY:** Billy, appreciate your comments.
21 I think that we can say that item four is
22 closed based on the fact that this is for the
23 NTS use. We've stated that one way will be
24 used for the rocket tests and another way will
25 be used for other internal exposures. And as

1 Mark said, there's not that many doses that
2 will have to be done this way, so I would like
3 to close this out, please. What -- what's the
4 working group's thoughts on this?

5 **MS. MUNN:** Well, this is Wanda. I'm wondering
6 if there is a simple way to revise the language
7 of this last paragraph slightly in those last
8 few sentences to better incorporate what I
9 think I heard from Mark with respect to how
10 these highly unlikely cases would be addressed
11 if they do occur. It didn't sound to me as
12 though there would be a cut and dried
13 methodology that could be applied to all
14 circumstances because each of these
15 circumstances would be not only unlikely but
16 quite different. Can we -- if there's -- if
17 there's hesitance on anyone's part, can we fix
18 it with language in the matrix, is my question.

19 **MR. PRESLEY:** Mark --

20 **MR. ROLFES:** Bob --

21 **MR. PRESLEY:** -- is there a simple fix to that
22 last statement?

23 **MR. ROLFES:** Let's see, is this regarding if a
24 worker who partici-- is it the last paragraph
25 that you're referring to?

1 **MS. MUNN:** Yes, (unintelligible).

2 **MR. ROLFES:** Okay, as Laurie mentioned, this is
3 what we have documented in the revision of the
4 NTS-5 Rev. 1. If there is something that you
5 would like us to look into or change in
6 regarding to this language, then we could
7 certainly take a look at doing so in order to
8 resolve any potential outstanding comment.

9 **MS. MUNN:** I'm just not certain whether there's
10 easy language to clarify that a little more in
11 -- gosh, yeah. I -- I don't see that this has
12 to be the same language as the report, although
13 the report is the official document, is it not?

14 **MR. PRESLEY:** Correct.

15 **MS. MUNN:** That's what your dose
16 reconstructor's going to look at?

17 **MR. PRESLEY:** You know, Wanda, with the
18 language here, it says if this information is
19 not available for the NRDS workers, then you
20 know, internal exposures can be addressed
21 through either OCAS IG-002 or the IMBA EXPERT
22 codes, and the -- which are the -- the newest
23 thing going.

24 **MS. MUNN:** Yes, I'm -- I guess the real
25 question is, is this being interpreted

1 correctly by SC&A? I -- I -- when I read that
2 I did not get the implication that the
3 methodologies were likely to achieve similar
4 results. I got the impression that different
5 circumstances would require the use of -- of
6 different methods. Is -- am I -- am I off-
7 course here? Is that -- is that what you were
8 saying, Arjun and John?

9 **DR. MAURO:** Yes, I -- well, the default to
10 IMBA, lacking better methods or better
11 information, doesn't seem to be the solution.
12 That is, there are -- there are scenarios, as I
13 understand it, where IMBA is really not going
14 to serve us well and there may be other methods
15 that may need to be applied, depending on the
16 exposure situation for the ingested particle.
17 So I guess -- my understanding -- so the
18 language the way it is now really def--
19 eventually says well, listen, if worse comes to
20 worst, just use IMBA. And my understanding is
21 that IMBA may not serve us well when we're
22 dealing with this ingested, relatively
23 insoluble hot particle.

24 **MS. MUNN:** Yeah.

25 **DR. MAURO:** Do -- by the way, does -- does

1 NIOSH and ORAU agree that there are
2 circumstances where IMBA may not be the best
3 way to approach this problem?

4 **MR. ROLFES:** I would have to take a look at the
5 facts of the case that we're dealing with and
6 then make a decision based on the facts that we
7 have at hand.

8 **DR. MAURO:** I agree with that, and maybe that's
9 the words we need.

10 **MR. ROLFES:** Then that -- that's an unwritten --
11 -- that -- that may not be documented but, as
12 you know, that's the first piece of information
13 that we would consider in an individual's dose
14 reconstruction, and those pieces of
15 documentation are contained within the
16 claimant's files.

17 **DR. MAURO:** The on-- the only concern is right
18 now the words that really don't say that. They
19 say default to IMBA. You know, push comes to
20 shove, if you're at a loss, go to IMBA. And I
21 guess the answer is well, not necessarily.
22 There may -- there area circumstances where
23 IMBA won't serve our purposes well here.

24 **MS. MUNN:** And that -- Mark, my primary concern
25 here is the issue of our archives of what we

1 do.

2 **MR. ROLFES:** Uh-huh.

3 **MS. MUNN:** And if -- if the archive -- this
4 matrix will turn out to be the archive of the
5 workgroup.

6 **MR. ROLFES:** Correct.

7 **MS. MUNN:** And if we can in some way reflect
8 the (unintelligible) of what this discussion
9 has been about, and if we all -- if we're all
10 in agreement that IMBA may not be the best
11 default, that it's an individual issue, not
12 necessarily a cut and dried decision with
13 respect to which method to use, it -- if -- it
14 just feels like it would make sense to choose
15 our words for this closure matrix --

16 **MR. ROLFES:** Uh-huh.

17 **MS. MUNN:** -- in a slightly different way so
18 that it emphasized that it's such an individual
19 thing that no specific direction can be given
20 until the individual case is in hand.

21 **MR. ROLFES:** Okay.

22 **MS. MUNN:** Which I believe is -- is that right,
23 SC&A? Am I saying the right thing?

24 **DR. MAURO:** You -- my answer is yes, that --
25 that -- and it sounds like it -- pretty

1 straightforward. It's just some rewording here
2 to alert the -- the dose reconstructor that --
3 that IMBA is not ne-- and as long as you folks
4 -- you know, assum-- are in effect saying that,
5 if -- if you believe that there are
6 circumstances where IMBA really can't be used
7 to do the dose reconstruction for this
8 scenario, it should say that. Right now it
9 doesn't say that.

10 **MR. SMITH:** Yeah, but what it does say -- this
11 is Billy --

12 **DR. MAURO:** Okay.

13 **MR. SMITH:** -- it says that if there is a
14 scenario where a person gets a hot particle
15 from NRDS, they're going to use the NRDL model.

16 **DR. MAURO:** Correct, but --

17 **MR. SMITH:** If for some reason the information
18 is not available that the NRDL model can be
19 used, then they will look at another
20 alternative, which is the IMBA code. Now I
21 think the concern may be -- on SC&A's part is
22 that the -- the probability that the IMBA code
23 is going to give a lower dose than the NRDL
24 model is going to give, so if you can't use the
25 IMBA codes, then what model is the dose

1 reconstructor going to use if the NRDL --

2 **DR. MAURO:** Yes.

3 **MR. SMITH:** -- model is not appropriate --

4 **DR. MAURO:** Yeah, I --

5 **MR. SMITH:** -- (unintelligible) you don't have
6 enough information.

7 **DR. MAURO:** Yeah, I -- I mean I'm not
8 disagreeing with any -- with -- with you folks.
9 It's just a matter -- if you're comfortable
10 that the IMBA code could be used in a given
11 circumstance, great. But I guess I'm
12 visualizing if someone is going through this
13 without giving some thought to wait a minute,
14 IMBA really doesn't apply here and we don't
15 have suf-- the -- you know, it does not
16 necessarily have to be the NRDL report. I'm
17 more concerned about -- and -- and when you're
18 doing a dose reconstruction to the GI tract and
19 it's a scenario where a person may have
20 ingested a hot particle, a relatively hot
21 particle that's insoluble, that they simply ask
22 themselves the question -- and maybe this is
23 how it's done -- well, listen, I think under
24 these circumstances IMBA may not serve us well,
25 may not be claimant favorable, and there are

1 other ways to deal with this. If -- if -- if
2 you believe that's true, then I guess those
3 words should say that. If you believe no, IMBA
4 will serve us well, then that's fine, too. But
5 right now it's a bit ambiguous exactly what the
6 dose reconstructor is supposed to do when
7 confronted with this scenario.

8 **MR. ROLFES:** Okay. So it sounds like me this -
9 - to me this is more of, you know, how we would
10 go about assigning dose from a particular
11 exposure, which I really don't feel is
12 appropriate to put into the Nevada Test Site
13 SE-- or, excuse me, site profile because it's
14 something that could impact other -- other
15 sites, and it refers to how we interpret
16 bioassay data or how we assign dose from a
17 given exposure. And this is something that I
18 think is detailed within the OCAS
19 Implementation Guidelines that we've referenced
20 here in the -- in the response.

21 **MS. MUNN:** I wouldn't recommending -- recommend
22 anything in the site profile. I'm just looking
23 specifically at the wording in the matrix,
24 personally.

25 **MR. ROLFES:** Okay, okay, so you would like

1 information specific to the matrix that would
2 clarify --

3 **MS. MUNN:** That was -- that was my thinking.
4 I'm just --

5 **MR. ROLFES:** Okay.

6 **MS. MUNN:** -- concerned about the long-term
7 archive of this workgroup and what we've agreed
8 to.

9 **MR. ROLFES:** Okay.

10 **MS. MUNN:** And it -- there's been so much
11 discussion on this -- on this situation that
12 probably will never occur, but if it does
13 occur, it would be helpful -- seems to me --

14 **MR. ROLFES:** Okay.

15 **MS. MUNN:** -- if there's something here on the
16 -- the matrix that said essentially this isn't
17 likely, we can't foresee this happening, but in
18 the unlikely event that it does, we'll have to
19 use the method that's appropriate for that --
20 that circumstance.

21 **MR. ROLFES:** Okay, so that's the language that
22 you would like incorporated into the matrix
23 here?

24 **MS. MUNN:** That was just my opinion.

25 **DR. ROESSLER:** Yes, I agree with Wanda. I

1 think the word "unlikely to occur" would -- as
2 we come back to this and look at it again,
3 would give a different perspective.

4 **MR. ROLFES:** Okay. Would -- would that be okay
5 then if we, you know, documented, you know, the
6 probability of such occurrence within the
7 matrix, would that be responsive to -- to what
8 your concern is?

9 **MS. MUNN:** It would to me --

10 **MR. ROLFES:** Okay.

11 **MS. MUNN:** -- and I'm not speaking of numerical
12 or statistic probability, just --

13 **MR. ROLFES:** Okay.

14 **MS. MUNN:** -- just indicating that this -- no
15 one expects this to happen --

16 **MR. ROLFES:** Okay.

17 **MS. MUNN:** -- given the controls that were in
18 place. In the event that it did, it would have
19 to be individual decision with respect to
20 method for dose reconstruction.

21 **MR. ROLFES:** Okay. Gene or Laurie, could we
22 incorporate that information, the -- you know,
23 the probability of this occurrence, could we
24 add some -- a simple statement into the matrix
25 to indicate that we have considered the

1 likelihood of such a scenario?

2 **MS. ARENT:** Yes.

3 **MR. ROLLINS:** Mark, this is Gene. First I want
4 to apologize for not responding to your last
5 question. It wasn't that I'd fallen off the
6 planet; there's just too many buttons on this
7 telephone.

8 **MS. MUNN:** Phone technology is just a
9 (unintelligible).

10 **MR. ROLLINS:** Yeah, I'm -- I'm marking up this
11 matrix as we speak.

12 **MR. PRESLEY:** Okay, and --

13 **MS. MUNN:** That would be helpful and, from my
14 perspective, if that rewording could just be
15 sent out to -- to the working group, if the
16 working group agrees on it, just add it to the
17 matrix.

18 **MR. PRESLEY:** I have no problem with that.

19 **MR. ROLFES:** Okay.

20 **MR. PRESLEY:** That's just more for Mark to do.

21 **MS. MUNN:** Yes, I know.

22 **MR. PRESLEY:** Right here before Christmas.

23 **MS. MUNN:** Well, he has nothing to do between
24 Christmas and New Year's.

25 **MR. PRESLEY:** I know better than that. Okay --

1 **MR. ROLFES:** That's what I'm here for, so if
2 that's --

3 **MR. PRESLEY:** What we -- what we will do then
4 is we will -- will be looking for wording added
5 to the matrix --

6 **MS. MUNN:** Just clarification wording.

7 **MR. PRESLEY:** -- right, about the likelihood of
8 this happening. And then if Mark will send
9 that out, we will look at the wording. And if
10 everybody has -- says it's okay, Mark, we'll
11 send that back to you and -- and it'll be a go.

12 **MR. ROLFES:** All right. Okay, Mr. Presley, are
13 we ready to move on here?

14 **MR. PRESLEY:** Yes, we are.

15 **MR. ROLFES:** Okay.

16 **MR. PRESLEY:** Let's go to --

17 **DR. ROESSLER:** Bob, I'm going to cut out for a
18 minute -- this is Gen. I think I've burned out
19 the battery on this phone. I'm going to switch
20 to another one. So I'll bow back in shortly.

21 **MR. PRESLEY:** Okay.

22 **DR. ROESSLER:** But go ahead.

23 **COMMENT FIVE: RESUSPENSION**

24 **MR. PRESLEY:** All righty, we're going to start
25 with -- or go back to 5-7, 15 and 23, has to do

1 with comments on the resumption (sic) model and
2 resumption (sic) factors are not scientifically
3 defendable (sic) or claimant favorable due to a
4 variety of factors. Dose -- doses may be
5 underestimated -- and then it goes through
6 quite a few things here. Mark, I'm going to
7 let you discuss this. This one that we have
8 beat to death.

9 **MR. ROLFES:** Yes.

10 **MS. MUNN:** Oh, and one more thi-- Mark, this is
11 Wanda.

12 **MR. ROLFES:** Yes, Wanda.

13 **MS. MUNN:** I -- I'm not at all sure that I have
14 done my homework. I'm not sure I've read the
15 white paper. When -- when did Gene do that
16 white paper?

17 **MR. ROLFES:** Well, if you recall, there were
18 several white papers or several drafts that we
19 had put together. We had discussed and
20 presented our initial methodology --

21 **MS. MUNN:** Yeah, I remember seeing the drafts,
22 I just don't remember whether I ever actually
23 saw the final document.

24 **MR. ROLFES:** Okay --

25 **MS. MUNN:** Gene, when did that -- that final

1 come through, do you know? I'm wondering if I
2 can track it back quickly on my -- my computer
3 and --

4 **MR. ROLFES:** Wanda, I can answer for Gene.
5 There may not have been a final white paper
6 sent on to the Advisory Board members. I'll
7 let Gene respond to that in just a second, but
8 the final version ultimately will be
9 incorporated into the ambient exposure --
10 excuse me, the ambient -- excuse me, the
11 environmental portion of the site profile,
12 Chapter 4.

13 **MS. MUNN:** Yeah, I -- I'm -- I think it's a
14 moot question anyhow because my -- my memory is
15 that we had resolved all of the outstanding
16 issues with resuspension, but I just didn't
17 remember whether I had actually seen the final
18 document. So it's -- it's probably not worth
19 discussing.

20 **MR. CLAWSON:** Wanda, this is Brad. Not to mock
21 your memory or anything else, but I remember
22 the same thing, but when we closed this this
23 was pending on the white paper, the final of
24 the white paper, and I don't know if I have
25 seen it yet either.

1 **MR. ROLLINS:** This is Gene Rollins. I believe
2 the -- the initial draft was sent out because I
3 can remember John Mauro asking me some
4 questions, which indicated to me that he had
5 read through it.

6 **MS. MUNN:** Right.

7 **MR. ROLLINS:** There is going to be another
8 revision I'm working on currently that's going
9 to address enriching the near field with the
10 refractories and some of the correction factors
11 for early fission products, as I'm calculating
12 right now, are going to increase substantially.
13 So -- but those correction factors will be put
14 into the -- into the TBD, Chapter 4.

15 **MS. MUNN:** Oh, okay. When is that likely to be
16 incorporated, do you know? Well, you don't
17 know how -- when your new editions are going to
18 be done.

19 **MR. ROLLINS:** I will say that the -- Chapter 4
20 is now in review. When that version is
21 approved, I will immediately initiate a page
22 change that will incorporate these new fission
23 activation correction factors, and page changes
24 typically don't take that long to get through.

25 **MS. MUNN:** Yeah. Do we -- do we have any hope

1 at all of having that on deck by the time we go
2 to Las Vegas?

3 **MR. ROLLINS:** I'll let Mark field that
4 question.

5 **MS. MUNN:** That just way (unintelligible).

6 **MR. ROLFES:** Well, you know, we are around the
7 holiday season --

8 **MS. MUNN:** I know.

9 **MR. ROLFES:** -- and I know many people are in
10 fact operating at a reduced budget right now
11 and with a very high load of work. So I don't
12 want to speak and say that we will be able to.
13 We will certainly do our best to, as we always
14 do. I -- I couldn't give you a -- a more
15 detailed response as to a date that this might
16 be finalized.

17 **MS. MUNN:** Yeah, well, I didn't want to press
18 you. It's just -- it's just -- this is one of
19 those key factors that we've worked with so
20 long --

21 **MR. ROLFES:** Uh-huh.

22 **MS. MUNN:** -- it would really be nice to be
23 able to say at Nevada that we've thrashed this
24 one right down to the last nit and that it's
25 all completely squared away and the documents

1 are currently updated as they should be. But
2 if -- it's just a timing issue.

3 **MR. ELLIOTT:** Well, Wanda, this is Larry
4 Elliott. As Mark and Gene have indicated, if -
5 - if we possibly can and it's simply a page
6 change and we can get all of that and the logic
7 behind the page change reviewed in a timely
8 manner, we'll do so. But Mark's correct in
9 pointing out that -- that we're operating here
10 under constrained resources at this time of the
11 year, so -- and I'm not sure when this came
12 over to us for review, but you know, there's --
13 there's a series of reviews it has to go
14 through, so we'll try to get it there if we
15 can.

16 **MS. MUNN:** I understand.

17 **MR. ELLIOTT:** If not, we'll be ready to explain
18 its status currently at that time.

19 **MS. MUNN:** Good.

20 **MR. PRESLEY:** This is Bob Presley. If I
21 remember correctly when we were in Cincinnati
22 on the 25th we discussed this and -- and you
23 all told us at that point that the likelihood
24 of this being done by the time we went to NTS
25 was almost slim and none. So you know, I

1 understand. The only thing we can ask is to do
2 your best, which I know you will do, and we can
3 go from there.

4 **DR. MAURO:** As a refresher -- this is John --
5 is Lynn Anspaugh still on the line? If he's
6 not, I -- I'll -- I'll just -- 'cause he's been
7 tracking this a little closer than I have, but
8 I recall that there were three items that --

9 **MS. MUNN:** Uh-huh.

10 **DR. MAURO:** -- we had discussed, and let's see
11 if I -- there may be more, but the ones that I
12 -- my recollection is the number one you
13 mentioned, which I think was by far the most
14 important, that is the -- the fractionation
15 issue, sounds like you've got that well in
16 hand. That's great.

17 The other had to do with -- with -- I believe
18 you were basing your model for inhalation on
19 air sampling data that was collected at some
20 time -- I (unintelligible) the year -- and then
21 -- and I -- I remember one of our concerns is
22 that, you know, when you were applying that to
23 earlier years, let's say you wanted to go back
24 to 1963, I think you were taking later data,
25 air sampling data, and then sort of go back to

1 -- okay, what would the exposures be in 1963,
2 '64, you know, and you went -- and the way I
3 understood it is you went back in time and
4 back-calculated what might -- what the mix
5 would be for an earlier time using Hicks tables
6 type approaches, know-- knowing if you have
7 this much airborne activity, this mix of
8 radionuclides in the air at this thumb, you'd
9 theoretically go back to an earlier time and
10 figure out not only the -- the ho-- your
11 activity that would be because they decayed,
12 but also other radionuclides that may have gone
13 away. You could come -- you can reconstruct
14 that. And I -- I believe -- I believe you --
15 did you do that in the white paper, or has that
16 been done yet, this second issue?

17 **MR. ROLLINS:** This is Gene Rollins. John, the
18 way we addressed -- we did address early
19 fission activation products --

20 **DR. MAURO:** Yes.

21 **MR. ROLLINS:** -- using the -- using the Hicks
22 data.

23 **DR. MAURO:** Okay.

24 **MR. ROLLINS:** And then that -- and that's what
25 I just mentioned, that once we -- we have gone

1 back now and enriched the near field --

2 **DR. MAURO:** Okay, that -- you -- you mentioned
3 the -- the fractionation issue and that --
4 which were a different problem, and that was
5 the fact that -- you know, there's the
6 fractionation issue --

7 **MR. ROLLINS:** Well, that all comes together
8 because it also allows us to postulate what was
9 there shortly after -- within months after
10 detonation.

11 **DR. MAURO:** Okay, good, so -- so in -- in one -
12 - in effect those -- these -- these issues
13 which I have separately in my mind, I can see
14 how you could -- they really come together as
15 really a single issue.

16 **MR. ROLLINS:** Right.

17 **DR. MAURO:** Ok-- okay, and you're addressing
18 that. Now there was another problem that I
19 recall that -- there was some cleanup between
20 the time that the air sample was taken and --
21 let's say you're going backwards in time now,
22 apparently -- at least some -- and this was an
23 issue that perhaps the -- there was a cleanup
24 operation that took place, let's say between
25 the mid-1960s and the later time period when

1 you have your air sampling data, and we were
2 concerned that that -- and from that
3 perspective, you know, you've got a problem.
4 You know, how do you go backward -- how do you
5 use more recent data to go backward if there
6 was some cleanup in between. Is that a -- am I
7 -- first of all, is my recollection correct
8 that that was an issue we discussed? And if
9 so, how -- do you have a way to deal with that?

10 **MR. ROLFES:** Yes, John, we did discuss that a
11 bit and the cleanup was limited to, for
12 example, picking up pieces of structural steel.
13 It wasn't necessarily linked in any way to
14 reducing the radionuclide inventory --

15 **DR. MAURO:** Ah --

16 **MR. ROLFES:** -- in the soil.

17 **DR. MAURO:** -- okay, I see what you're saying.

18 **MS. MUNN:** Yeah.

19 **DR. MAURO:** That's (break in transmission) --

20 **MR. PRESLEY:** This is Bob Presley. And if I
21 remember correctly, on that discussion you all
22 have all kinds of data on those later
23 operations.

24 **MS. MUNN:** (Unintelligible) cleanup
25 (unintelligible).

1 **MR. PRESLEY:** Yes.

2 **MS. MUNN:** (Unintelligible) pretty specific.

3 **DR. MAURO:** Yeah, that -- I wanted to make sure
4 that these various items that we talked about
5 earlier are not on your plate and being taken
6 care of in this -- the new analysis, and it
7 sounds like -- at least the ones I can recall.
8 There may have been others, I -- I -- that's
9 why I asked if Lynn might have been on the
10 line. He may recall some of the others that we
11 brought up at that time.

12 **MS. MUNN:** The key ones, though, were the three
13 -- the three comments, 7, 15 and 23.

14 **DR. MAURO:** Okay.

15 **MR. PRESLEY:** Okay. We have a -- what does
16 everybody want to do on the closure on this, on
17 item 5-7, 15 and 23?

18 **MS. MUNN:** Well, we've agreed on the technical
19 issues. It's just a question of
20 administratively getting it into the document,
21 and that's in process.

22 **MR. PRESLEY:** Yeah.

23 **MS. MUNN:** Resolved.

24 **MR. PRESLEY:** I think this ought to be closed
25 and let them get it into the document. Anybody

1 have a problem with that?

2 **DR. ROESSLER:** No problem.

3 **MR. SCHOFIELD:** No.

4 **MR. PRESLEY:** All righty. Mark that as such.

5 **MR. ROLFES:** I did also want to remind everyone
6 that this exposure scenario, the internal doses
7 resulting from environmental intakes, is purely
8 limited to the 1963 forward time period, so --
9 because of the SEC that was designated for the
10 1951 through 1962 time period.

11 **MR. PRESLEY:** All right.

12 **DR. MAURO:** Yeah, that -- that -- that -- yeah.

13 **MR. PRESLEY:** That was one of the things that
14 we discussed. Okay?

15 **MR. ROLLINS:** And this is Gene Rollins again.
16 I -- I do want to mention that the ambient
17 intakes that are discussed in the white paper
18 and have been incorporated into Chapter 4 of
19 the TBD also include an ingestion pathway of
20 100 milligrams per day of contaminated soil, so
21 I want you to keep that in mind as you move
22 through this matrix 'cause I think that might
23 come up again.

24 **MS. MUNN:** Oh, that's good information. Thank
25 you.

1 **MR. PRESLEY:** It -- it will, later on.

2 **DR. MAURO:** Good number, 100 milligrams a day.
3 We're -- that has been a subject of
4 longstanding disc-- debate and we've been
5 pushing for that and that's certainly a
6 bounding assumption.

7 **MS. MUNN:** It certainly would be a major
8 bounding assumption.

9 **MR. PRESLEY:** It comes up, if I remember
10 correctly, about 17, I think.

11 **COMMENTS EIGHT/NINE: USE OF 1967 DATA FOR 1963-1966**

12 Okay, let's go on to 8 and 9, the use of 1967
13 external dose data for 1963 through 1966 is not
14 claimant favorable. There was no test in '67
15 with measurable off-site fallout. Mark, do you
16 want to comment on this, please?

17 **MR. ROLFES:** Well, the information that we have
18 put together is now in Nevada Test Site Chapter
19 6, Revision 1, Page Change 1 -- and let me
20 verify, I do believe that that has been
21 approved. Let me check on my last page.

22 Actually that is still internal as well, so it
23 has not been approved yet formally. Let's see,
24 the -- in our response in this category for 8
25 and 9 is that unexposed control films and TLDs

1 were processed with personal dosimeters, and
2 the readings from these control dosimeters were
3 subtracted from personal dosimeter readings to
4 attain a net reading for determining exposures.
5 Beginning in April of 1957 all employees that
6 entered NTS were required to wear a dosimeter
7 while inside NTS. Because control dosimeters
8 were maintained in environmentally-controlled,
9 low background areas, exposure resulting from
10 elevated ambient environmental levels from
11 testing activities in other areas of the site
12 would have been included in the individual
13 exposure records. So ambient doses are no
14 longer being assigned after 1957 due to capture
15 by the universal badging and personal dosimetry
16 that was in place. So we show that this is
17 closed as well.

18 **DR. MAURO:** Bob, let me just make sure I -- so
19 the need to go -- to extrapolate backwards in
20 time is no longer necessary.

21 **MR. ROLFES:** Correct.

22 **DR. MAURO:** Okay, that's very important. You
23 actually have data for the earlier years, I
24 guess this 1963 to '66, so you're not going to
25 use 1967 data, external data, to reconstruct

1 doses for people exposed from '63 to '66. You
2 actually have real data.

3 **MR. ROLFES:** Correct.

4 **DR. MAURO:** Oh, okay.

5 **MR. PRESLEY:** Okay.

6 **MS. MUNN:** Resolved.

7 **MR. PRESLEY:** Yes? Somebody holler "Bob"?

8 **MS. MUNN:** No, I just said "resolved."

9 **COMMENT TEN: PRE-1963 EXTERNAL ENVIRONMENTAL DOSE**

10 **MR. PRESLEY:** Yes. Okay, let's move on to
11 comment 10, TBD does not provide any guidance
12 for pre-1963 external environmental dose, and
13 we touched on that just a few minutes ago.
14 Mark, you want to go back over that?

15 **MR. ROLFES:** I think this speaks to what we had
16 just stated as well, so I think this could have
17 been incorporated in the previous comment as
18 well, and our response is essentially the same.

19 **MR. PRESLEY:** Yes.

20 **DR. MAKHIJANI:** Yeah, I agree. This is Arjun.

21 **MR. PRESLEY:** Arjun, you have any -- you agree?

22 **DR. MAKHIJANI:** Yes, sir.

23 **MR. PRESLEY:** So we're going to call this one
24 closed and resolved.

25 And when we do -- when we redo this, Mark, how

1 about putting those together, 8, 9 and 10,
2 could you, please?

3 **MR. ROLFES:** We certainly can.

4 **MR. PRESLEY:** I appreciate that.

5 **DR. MAURO:** Now I know that there is an SEC
6 issue dealing -- I just want to make sure
7 there's no cross-wiring here -- there is an SEC
8 issue that we're currently looking at very
9 closely related to whether workers did not wear
10 their -- their film badges.

11 **DR. MAKHIJANI:** That's separate, John.

12 **DR. MAURO:** That's separate, so -- I just want
13 to make sure everybody's comfortable that --
14 that issue's --

15 **DR. MAKHIJANI:** That's a separate issue.

16 **DR. MAURO:** Clearly SEC, nothing to do here.
17 Good, okay. Thank you.

18 **MR. ROLFES:** And we will address that in number
19 20 of the matrix, and I did send out a separate
20 e-mail with an attachment that will further
21 elaborate on the analysis that we completed to
22 determine if this was in fact a -- a -- you
23 know, a -- an occurrence that was frequent or
24 infrequent, so --

25 **DR. MAURO:** Oh, is that the separate e-mail

1 that had all the graphs on it?

2 **MR. ROLFES:** Yes, correct.

3 **DR. MAURO:** Okay, I have that. Good, thank
4 you.

5 **DR. MAKHIJANI:** Mr. -- Mr. Presley, may I
6 interrupt? I -- I did not realize this call
7 was going to go on the whole day and I have
8 scheduled something at 2:00 o'clock and I will
9 need to go for about an hour. I just needed to
10 say that item 11 we have not reviewed before
11 and it is under review as we discussed in the
12 previous working group meeting, and I'll submit
13 that to you or SC&A will submit that to you
14 before the end of the year -- or -- or in the
15 first days of the next -- well before the next
16 Board meeting.

17 **MR. PRESLEY:** Okay.

18 **DR. MAKHIJANI:** And I will -- I hope to be back
19 in about an hour.

20 **MS. MUNN:** (Unintelligible)

21 **MR. PRESLEY:** You want to skip 11 for the time
22 being?

23 **MS. MUNN:** (Unintelligible) have Arjun on
24 (unintelligible).

25 **COMMENT TWELVE: RADON DOSE IN G-TUNNELS**

1 **MR. PRESLEY:** All righty. Let's go to 12, and
2 that's radon dose in G-tunnels are not claimant
3 favorable, has to do with the Gravel Gerties
4 and, Mark, I'll let you go --

5 **MR. ROLFES:** Okay.

6 **MR. PRESLEY:** -- do this, but if y'all will
7 remember, we've had quite a few discussions on
8 this and this was put to bed at the last
9 meeting.

10 **MR. ROLFES:** Yes. I did want to indicate that
11 we have addressed radon doses in G-tunnel. We
12 did revise those and they are more claimant
13 favorable than they previously were. We also
14 have guidance to the dose reconstructors
15 regarding Gravel Gertie radon exposures. That
16 was also updated in the TBD and this
17 information is contained in the Chapter 4,
18 Revision 1, Section 4.4.3 and 4.4.4, and that
19 is the section of the Technical Basis Document
20 that is currently at OCAS for review.

21 **MR. PRESLEY:** Okay. Does anybody have a
22 problem with that? John, you're all right?

23 **DR. MAURO:** Yeah, I mean it sounds like that
24 you actually have radon measurements. Could
25 you just give me conceptually the solution?

1 Other words --

2 **MR. ROLFES:** I'll let Gene speak to that. I do
3 believe that we increased the concentration of
4 the working level based on -- well, I'll let
5 Gene explain.

6 **MR. ROLLINS:** This is Gene Rollins. What --
7 what -- what I had done previously was -- the
8 work location was unknown. I had recommended
9 using a lower value than the maximum value that
10 was -- had been reported in G-tunnel --

11 **DR. MAURO:** Oh, okay.

12 **MR. ROLLINS:** -- and so all I did was just
13 change the document such that for unknown
14 locations that we would use the maximum value.

15 **DR. MAURO:** Okay, and approximately how many
16 measurements were made that -- upon which you
17 base that? Are we talking about a handful or a
18 large number of measurements?

19 **MR. ROLLINS:** I -- I -- it was only one report
20 -- or actually there were two reports that were
21 done over a period of two years. I would have
22 to guess -- they did them in each of the
23 tunnels, probab-- I -- I'd have to guess maybe
24 20 measurements per tunnel.

25 **DR. MAURO:** Okay. Okay, so you had a large

1 number of measurements. That -- that strategy
2 -- the idea of taking the high end value of the
3 distribution of values is -- as your universal
4 is -- is really appropriate.

5 **MR. PRESLEY:** Okay. Working group, anybody
6 have a problem marking that closed and
7 resolved?

8 **MR. CLAWSON:** This is Brad, I have no problem
9 with it.

10 **MR. PRESLEY:** Okay.

11 **DR. ROESSLER:** No problem.

12 **MR. PRESLEY:** All righty.

13 **MR. SCHOFIELD:** No problem.

14 **COMMENT THIRTEEN: IODINE-131**

15 **MR. PRESLEY:** All righty, let's go to 13, the
16 environmental dose due to -- doses due to I-1--
17 or -- not I --

18 **MR. ROLFES:** Iodine-131.

19 **MR. PRESLEY:** -- Iodine-131, I was having a
20 senior moment there, needs to be taken into
21 account for non-monitoring (sic) workers. This
22 is also one that we looked at and, Mark, you
23 want to comment on that?

24 **MR. ROLFES:** Sure. We did develop guidance for
25 unmonitored workers that would bound potential

1 organ doses from radioiodine exposures, and we
2 did incorporate a sample bounding calculation
3 based on the highest concentrations that were
4 measured -- for example, for the Baneberry
5 event, the highest concentrations that were
6 measured in Area 12 Camp following that release
7 -- and these sample calculations -- excuse me,
8 I can't speak, either, today -- are addressed
9 in the NTS Chapter 5, Revision 1 in that
10 Section 5.3.3.1.

11 **DR. MAURO:** Mark, a quick question for you.
12 When you used the measured data -- I presume
13 the -- it was an air sample that looked
14 specifically for iodine-131. Is that correct?

15 **MR. ROLFES:** Well, I would have to take a look.
16 However, as you know, there could have been
17 other radioiodines that were involved in --

18 **DR. MAURO:** That's why I asked.

19 **MR. ROLFES:** -- in any venting.

20 **DR. MAURO:** My -- my experience is that shortly
21 after a test or an expl-- the major contributor
22 to the thyroid dose -- or not -- is not iodine-
23 131 but iodine-132, 33, 34, 35 -- it's about a
24 -- they contribute maybe as much as seven or
25 eight-fold higher dose.

1 **MR. ROLFES:** That's very possible, depending
2 upon the time following --

3 **DR. MAURO:** You're tal-- exactly.

4 **MR. ROLFES:** -- the exposure.

5 **DR. MAURO:** My only -- my only concern I guess
6 is that when -- in this protocol that's been
7 adopted, that it includes consideration of the
8 time period following -- you know, when the air
9 sample was taken, if it was an air sample, and
10 -- and factored in there might have been these
11 other shorter-lived iodines also that are --
12 not maybe, there certainly was, if it was soon
13 after the event. They could be the major
14 contributor to the dose to the thyroid gland.

15 **MR. ROLFES:** It -- once again, depending upon
16 the time, those radioiodines would be
17 detectable by gamma spectroscopy of an air
18 filter. The -- for example, there are cases
19 where an individual was exposed to a
20 radioiodine and was surveyed, found to be
21 contaminated and was taken for a whole body
22 count following this exposure. And I have seen
23 in the records that all three potential
24 radioiodines that he was exposed to were
25 accounted for and credited. He was in fact

1 credited with dose for those exposures. So
2 that information is in fact known, so --

3 **DR. MAURO:** Okay, that -- yeah, as long as that
4 protocol doesn't, you know, ignore the short-
5 lived, then we're fine.

6 **MR. SMITH:** Mark -- Mark, this is Billy.
7 Generally these people were either -- direct
8 thyroid counting for sodium iodide crystals or
9 whole body counted, but generally we -- we were
10 evaluating the thyroid gland, we were looking -
11 - I mean iodine-131 -- radioiodine in the
12 thyroid, we did a thyroid count.

13 **MR. ROLFES:** Okay. Thank you.

14 **DR. MAURO:** Yeah, but see, what we ran into is
15 very often -- let's say a thyroid scanned for
16 the correct count would be looking particularly
17 for iodine-131, because several days later --
18 if that's when it's done -- you're going to
19 lose a lot of the short-lived, and the exposure
20 -- so therefore you end up seeing the iodine-
21 131 as being the only major -- only important
22 contributor, when in fact the majority of the
23 dose might have been delivered by the short-
24 lived iodines that he experienced and which
25 have long since disappeared, you know, sev--

1 'cause several days later they -- several of
2 them are not going to be there. And that was -
3 - those are only -- we're not saying that was -
4 - wasn't factored in, but I'm just -- I guess
5 my question is if you're basing your -- your
6 dose reconstruction on either air samples or
7 are based on a thyroid scan, that the short-
8 lived iodines are factored into the dose
9 reconstruction.

10 **MR. ROLFES:** When exposures could have
11 occurred, they certainly are incorporated into
12 a dose assessment. Typically when we have a
13 positive bioassay result for an individual that
14 was exposed, I have seen sample calculations
15 that were done for particular claimants from
16 Nevada Test Site or particular workers from
17 Nevada Test Site where -- essentially I believe
18 it was isotopic data from like the Hicks tables
19 that were used to assign intakes of other
20 radionuclides associated with this individual's
21 exposure at a given time following a test.

22 **DR. MAURO:** Excellent, that -- that's -- that's
23 -- you know, I -- I made reference to the
24 shorter-lived iodines, but certainly the full
25 suite of -- when you get to the shortly after -

1 - the air -- the radionuclides of airborne,
2 going to the Hicks tables will allow you --
3 especially if you have only one radionuclide
4 you measured, in theory you could predict what
5 every other radionuclide was as a function of
6 time that the person might have been exposed
7 to. Yes.

8 **DR. ANSPAUGH:** This is Lynn Anspaugh back for
9 just a minute. You know, there -- there are
10 REECo reports that calculated the doses, and I
11 think the highest one was 4 rem to the thyroid.
12 And I -- I believe REECo did a pretty good job
13 of documenting all that and including short-
14 lived radioiodines (break in transmission)
15 that's a little bit of concern is whether or
16 not there might have been a dose to the GI
17 tract that wasn't calculated and might be of
18 some interest in some particular cases.

19 (Unintelligible) on the phone he might have a
20 few comments about that. I don't know what was
21 an issue of concern at the time or not.

22 **MR. ROLFES:** Well, Lynn -- this is Mark Rolfes
23 -- and for example, if we do have doses
24 calculated to the thyroid, our Integrated
25 Modules for Bioassay Analysis program allows us

1 to calculate doses to any other organ within
2 the body. So that really wouldn't be an issue
3 that would belong in a site profile, but rather
4 would certainly be documented in an IMBA
5 calculation when necessary.

6 **MR. PRESLEY:** Okay, does anybody -- anybody
7 have a problem with this? I believe that's --
8 can I mark 13 closed and resolved?

9 **MS. MUNN:** Sounds resolved.

10 **COMMENT FOURTEEN: INTERNAL MONITORING**

11 **MR. PRESLEY:** Okay, let's go to 14. There are
12 no internal monitoring data till late 1955 or
13 1956, some plutonium from then, and then it
14 says plutonium from then on, some tritium from
15 '58, plutonium, tritium and mixed fusion (sic)
16 products from 1961. Mark, do you want to talk
17 about (unintelligible) --

18 **MR. ROLFES:** Certainly. I do want to point out
19 once again and reiterate that there is an SEC
20 in place for the years 1951 through the end of
21 1962, so the earlier internal monitoring issue
22 is moot at this point.

23 As it pertains to the 1963 time period forward,
24 we do have bioassay data for individuals, and
25 we have a claimant-favorable methodology to

1 interpret that bioassay data in place.
2 So let's see, I believe we have -- let's see,
3 I'm just taking a look at the rest of our
4 response here, and we did agree to putting that
5 guidance for interpreting those fission product
6 bioassay results and gross alpha bioassay
7 results into the site profile, or into the TBD
8 this is addressed in, the Nevada Test Site
9 Chapter 5, Revision 1, and it's specific to
10 section 5.6.3.

11 **MS. MUNN:** (Unintelligible)

12 **MR. PRESLEY:** Good. Yeah, I remember
13 discussing that last time. Okay --

14 **MR. ROLFES:** And with one other thing --

15 **MR. PRESLEY:** All right.

16 **MR. ROLFES:** -- there are also -- whole body
17 counting on site did become routine in 1967.
18 Prior to 1967 there were (break in
19 transmission) counts conducted as well, so that
20 information is available. But I thought that
21 that was appropriate to add that as well, so...

22 **DR. ROESSLER:** Mark?

23 **MR. PRESLEY:** Okay, go ahead somebody.

24 **DR. ROESSLER:** It's Gen. The SC&A comment
25 mentions plutonium from then on, so I assume in

1 the -- in your methodology you have handled
2 that also.

3 **MR. ROLFES:** Well, we -- we have indicated that
4 we have a methodology to interpret gross alpha
5 bioassay data, so that would incorporate a
6 plutonium exposure such as plutonium-239, 240.

7 **DR. ROESSLER:** Okay. Okay.

8 **DR. MAURO:** So you -- so you -- what I'm
9 hearing is you have data from '63 to '67 --

10 **MR. ROLFES:** Yes.

11 **DR. MAURO:** -- it might be limited, but
12 sufficient to build a coworker model.

13 **MR. ROLFES:** Yes, if needed, there is
14 information to allow us to assign internal
15 doses for the people that were directly
16 involved with and had a potential for exposures
17 to the radionuclides of concern.

18 **MR. PRESLEY:** Okay, anybody else have anything
19 else?

20 **MR. CLAWSON:** Well, Mark, this is just Brad. I
21 just want to make sure -- now the earlier years
22 are under the SEC. Right?

23 **MR. ROLFES:** That's correct, up until the end
24 of 1962.

25 **MR. CLAWSON:** '62, okay. I just wanted to make

1 sure (unintelligible) --

2 **MR. PRESLEY:** '51 to '62. Okay?

3 **DR. ANSPAUGH:** This -- this is Lynn Anspaugh
4 again. I'm a little bit confused on this
5 issue. If somebody didn't work there 250 days,
6 then you still have to do a dose
7 reconstruction. Right?

8 **MR. PRESLEY:** Now --

9 **MR. ROLFES:** However we would not assign
10 internal doses to that individual because of
11 the SEC that was designated, so we would only
12 be limited to assigning external doses to the
13 individual.

14 **DR. MAURO:** Yeah, I would be able to help out a
15 little bit here. On the 250-day workgroup
16 we're explicitly addressing the possibility and
17 the plausibility of reconstructing doses for
18 short-term exposures, so it -- it -- an
19 interesting development is that it may be
20 plausible to reconstruct short-term internal
21 exposures, and it's being looked at right now
22 as part of the 250-workday investigation, which
23 is an SEC issue.

24 **MR. PRESLEY:** Okay.

25 **MR. CLAWSON:** (Unintelligible), you know, I

1 understood that. But Bob, didn't we, with the
2 250 days for NTS, wasn't it -- didn't we come
3 up with a -- because the people were living out
4 there 24/7, we did --

5 **DR. ROESSLER:** No, that was another -- I think
6 that was another scenario, wasn't it?

7 **MR. PRESLEY:** Yes, but it -- it had -- it had
8 the same thing as this right here. Didn't we
9 come up with --

10 **MR. CLAWSON:** Like 89 days or --

11 **DR. MAURO:** 83, yeah. It's really not 250
12 days, it's 83 work -- 83 calendar days.

13 **MR. PRESLEY:** Yeah, right, right, that's
14 exactly what it was.

15 **MR. CLAWSON:** I just wanted to make sure
16 (unintelligible) --

17 **MS. HOMOKI-TITUS:** Hi, this is Liz, I'm sorry
18 to interrupt. That was actually a decision,
19 just to be clear, that has to be made by the
20 Department of Labor.

21 **MR. PRESLEY:** Right.

22 **MS. HOMOKI-TITUS:** It wasn't made by HHS.

23 **MR. PRESLEY:** Right.

24 **MR. ROLFES:** That's correct.

25 **MR. PRESLEY:** Yeah, that was made by the

1 Department of Labor, to go with an 83-day, as I
2 remember -- correct.

3 **MR. CLAWSON:** Okay.

4 **COMMENT SIXTEEN: USE OF PHOTON DOSE**

5 **MR. PRESLEY:** Okay, let's move on to 16, use of
6 photon dose as done by DTRA as a basis of
7 estimating internal doses during periods when
8 there are no data or scattered internal
9 monitoring data. Mark, do you want to -- this
10 is something that we -- again, that we've taken
11 care of, but you want to --

12 **MR. ROLFES:** That's --

13 **MR. PRESLEY:** -- kind of elaborate on it just a
14 little bit?

15 **MR. ROLFES:** Correct, and that was -- that was
16 certainly investigated early on during the
17 atmospheric weapons testing days or device
18 testing days and we have not pursued that any
19 further because we ended up designating the SEC
20 for the 1951 through 1962 time period.

21 **MR. PRESLEY:** Okay, we want to mark that
22 closed. All righty.

23 **COMMENT SEVENTEEN: INGESTION DOSES**

24 Go on to 17, ingestion doses need to be better
25 evaluated, and you want to --

1 **MR. ROLFES:** And as Gene had indicated
2 previously, the environmental section of the
3 site profile does now include a very claimant-
4 favorable ingestion pathway of 100 milligrams
5 per day of contaminated soil, so we feel that
6 that issue is closed.

7 **MR. PRESLEY:** John, do you have a comment on
8 that?

9 **DR. MAURO:** I fully agree that's the way to
10 close this one.

11 **COMMENT EIGHTEEN: OTIB-002**

12 **MR. PRESLEY:** All righty. Going to 18,
13 recommended use of OTIB-002 for the post-1971
14 tunnel re-entry workers, and Mark, do you want
15 to --

16 **MR. ROLFES:** Okay.

17 **MR. PRESLEY:** -- comment on that?

18 **MR. ROLFES:** We did change some of the language
19 which indicates that dose reconstructors should
20 observe the limitations of the approach
21 contained in maximum internal dose estimates
22 for DOE complex claims, and any contrary
23 instructions have been removed from the site
24 profile for Nevada Test Site. So we feel this
25 issue is closed.

1 **MR. PRESLEY:** And that's been addressed in
2 Revision 5 (sic).

3 **MR. ROLFES:** Correct.

4 **MR. PRESLEY:** Okay, does anybody have anything
5 about that?

6 **MR. SCHOFIELD:** No.

7 **MR. PRESLEY:** John, are you all right with --

8 **DR. MAURO:** Oh, absolutely. We were just
9 concerned if they were applying OTIB-2 to a
10 situation where it wasn't appropriate, and it
11 sounds like that's been resolved.

12 **COMMENT NINETEEN: PRE-1966 BETA DOSES**

13 **MR. PRESLEY:** Right. Going to 19, there are no
14 beta dose data until 1966, the TBD dose not
15 specified or specifically a procedure for
16 estimating pre-1966 beta doses. Mark?

17 **MR. ROLFES:** Okay, I will read from what we've
18 got here in our response, and we do have time-
19 dependent beta-gamma ratios that have been
20 developed and were added to the Technical Basis
21 Document. We're also looking into the
22 development of a method using Hicks data for
23 the tower and surface shots. Let's see, we
24 also -- as I had reported to you at the last
25 working group meeting, we had looked through

1 200 claimant external dosimetry files and
2 evaluated their data to determine whether there
3 were positive neutron, beta and gamma results.
4 And of the 200 files that we reviewed, 23
5 contained a total of 140 positive beta or
6 shallow dose results. What was apparent from
7 this review is that -- let's see, when there
8 were positive beta results, they were not the
9 norm, so it -- from this 200, a very low number
10 of actual bad readings contained a positive
11 dosimetry result.
12 There was a total of 256 positive photon
13 results for the years in which the positive
14 beta results were located. And let's see, I --
15 as far as the beta-to-photon ratios that we
16 have and observed in this review, based on the
17 annual exposure dosimetry totals for the year
18 in which the positive beta results were
19 available, a review of 50 annual ratios found
20 25 to be less than a one-to-one ratio, 13
21 ratios were between one and two-to-one, and
22 only three of the 50 ratios were equal to or
23 greater than four-to-one beta to gamma. Right
24 now our site profile has an indication that we
25 can use up to a five-to-one beta to gamma

1 ratio.

2 Furthermore, there are additional survey
3 documents and rad safe reports that do have
4 measurements, and these that I'm speaking of
5 are particular to the NRDS tests as well, so...

6 **MR. PRESLEY:** Okay.

7 **DR. MAURO:** Mark, this is John. I -- I have a
8 question. It sounds like that there are two
9 kinds of analyses that we have here to deal
10 with this beta dose. One is a theoretical one
11 where by looking at Hicks tables, if you know -
12 - or given the point in time you're at
13 following a test --

14 **MR. ROLFES:** Uh-huh.

15 **DR. MAURO:** -- and you have your gamma reading,
16 you could predict what the beta yield would be,
17 and that would be a theoretical -- certainly
18 one very reasonable approach to doing it,
19 probably gives you pretty high estimate.
20 The other approach is to actually use your
21 measurements that were taken --

22 **MR. ROLFES:** Uh-huh.

23 **DR. MAURO:** -- and my guess is you'll get
24 substantially different results when you actual
25 use measured data. What -- what approach are

1 you adopting? That is, for the purpose of
2 reconstructing beta dose, are you going to use
3 -- I be-- are you going to use the actual
4 empirical measurements for the ratios --

5 **MR. ROLFES:** In (unintelligible) --

6 **DR. MAURO:** -- or are you going to use the
7 theoretical ones based on Hicks?

8 **MR. ROLFES:** Empirical data would always
9 outweigh any theoretical calculation that could
10 be done, and I believe we're just investigating
11 the Hicks tables just to -- to see if we're
12 right -- in the right ball park, excuse me.
13 But certainly the recorded data would outweigh
14 any theoretical calculations.

15 **DR. MAURO:** I -- I would just caution -- you
16 know, if -- let's say there's a big difference,
17 a substantial difference between the ratios.
18 You may want to check to see wha-- the
19 reliability of the beta measurements, given
20 some of the limitations of beta detection.

21 **MR. ROLFES:** Yes, and certainly we could look
22 into that as well, as we previously discussed.
23 And I guess to further elaborate on that, we
24 did have a discussion at the last working group
25 meeting about low energy beta particles.

1 However, when individuals have a potential for
2 beta exposures, those individuals are likely in
3 anti-contamination clothing plus their own
4 personal clothing. And so any low energy beta
5 emitters that wouldn't have been recorded by a
6 dosimeter's open window would have not
7 penetrated through that individual's --

8 **DR. MAURO:** Uh-huh.

9 **MR. ROLFES:** -- clothing to irradiate their
10 skin at a depth of seven milligrams per square
11 centimeter. Let's see --

12 **DR. MAURO:** By the way, I did notice an -- we
13 believe that in making that determination --
14 you know, what might penetrate through the
15 clothing, beta -- beta energy and -- and the --
16 the shielding effect of his clothing, I don't
17 know if this has any play here, but we noticed
18 that in a calculation that was done in OTIB-17
19 there was an assumption regarding the density --
20 - you know, the grams per centimeter squared --

21 **MR. ROLFES:** Uh-huh.

22 **DR. MAURO:** -- of clothing, and I think there
23 might have been a six-fold error in that
24 calculation, the reason being there was --
25 which is being discussed as part of TBD-17, but

1 if you use that factor, shielding factor --
2 maybe ought to take another look at that.

3 **MR. ROLFES:** Okay. And then also one of the
4 reasons we are looking into the Hicks tables is
5 to determine whether any of these lower energy
6 beta particles were produced. Is that correct,
7 Gene? Is that one of the reasons that we were
8 reviewing the Hicks data, to determine any weak
9 beta emitters?

10 **MR. ROLLINS:** That's part of what Richard's
11 looking at -- Richard Griffith is -- that's
12 what he's looking at. I haven't reviewed his
13 results yet. I was more interested in how the
14 refractories could be enriched so I -- yes, but
15 that is part of what he's -- he's reviewing.

16 **MR. ROLFES:** Okay.

17 **DR. MAURO:** Yeah, if they -- you know, the idea
18 circumstance would be if your empirical
19 measurements are very compatible with the Hicks
20 measurements -- Hicks theoretical relationship,
21 you know you've got a rock solid case. If
22 there is a large difference, then of course
23 you're in that difficult situation of -- and
24 let's say Hicks is more limiting, it becomes
25 the bounding -- you're in a difficult situation

1 of, you know, demonstrating why you're going to
2 go with the lower ratio for the reasons you
3 gave. I mean in principle the arguments you're
4 making are certainly valid. That is, you're
5 going to get shielding effects. But -- but
6 then you're in that position where you have to
7 make that case. But ideally if the ratios come
8 out equivalent, that would be -- in -- in my
9 opinion, that would put this problem to bed.

10 **MR. PRESLEY:** Okay.

11 **DR. ANSPAUGH:** But again I think the ratios are
12 not going to come out equivalent because the
13 method that Griffith is using doesn't account
14 for the self-shielding effect of surface
15 roughness, so I think high priority really
16 should go to the empirical data, as Mark
17 mentioned.

18 **DR. MAURO:** Okay, thank you. I sta-- I stand
19 corrected.

20 **MR. PRESLEY:** All right. Anybody have a
21 problem with 19 then?

22 **MR. CLAWSON:** This is just Brad, so --

23 **MR. PRESLEY:** Go ahead.

24 **MR. CLAWSON:** -- (unintelligible) we come to a
25 conclusion on this. I know -- to me, it seems

1 like we're still kind of up in the air about
2 it.

3 **MR. PRESLEY:** Well, John just agreed.

4 **DR. MAURO:** Yeah. I mean I -- my only concern
5 was that if you're not going to use Hicks, you
6 know, that means you may not be as
7 conservative. But as Lynn pointed out, and I -
8 - and I defer to Lynn certainly -- that the
9 empirical data is the -- are the numb-- the
10 data to rely upon and I'm fine with that. It
11 sounds like you're going to come out with a
12 ratio that may be somewhat different than the
13 five-to-one that you've been using before. Is
14 that correct?

15 **MS. MUNN:** It sounded lower.

16 **DR. MAURO:** You're coming up with a higher or
17 lower value? If -- if I understood correctly,
18 the current guidance says a ratio of -- a beta
19 to gamma ratio of about five-to-one?

20 **MR. ROLFES:** Current guidance -- I'm sorry, I
21 didn't know if the question was guided to me,
22 John, I apologize. The current Technical Basis
23 Document has a range of beta-gamma ratios based
24 upon essentially the facts of the case that we
25 are working with and the individual's exposure

1 potential, and what we have in the site profile
2 has right now a maximum of five-to-one, I
3 believe, beta to gamma ratio. Does answer what
4 you had asked --

5 **DR. MAURO:** Well, and -- but I'm hearing that
6 you're revisiting that ratio right now.

7 **MR. ROLFES:** Well, we were asked to take a look
8 into -- we did indicate that we were going to
9 look into the Hicks table and we were going to
10 consider the refractory issue about adding
11 refractories back in --

12 **DR. MAURO:** Uh-huh.

13 **MR. ROLFES:** -- and we had tried to set up the
14 technical call, however we weren't able to do
15 that prior to this call. From what it sounds
16 like, though, the empirical data is the best
17 path forward and would certainly be -- be most
18 robust.

19 **MR. ROLLINS:** Mark, this is Gene Rollins, I --

20 **MR. ROLFES:** Yes, Gene.

21 **MR. ROLLINS:** I have in front of me the results
22 that Richard Griffith sent to me yesterday.
23 This -- this data has not been reviewed. I can
24 only just tell you what I'm looking -- the
25 graph that I'm looking at right now, and it's

1 basically beta to photon ratios based on the
2 Hicks data --

3 **MR. ROLFES:** Okay.

4 **MR. ROLLINS:** -- as a function of time after
5 detonation. And it -- it -- at
6 (unintelligible) zero, we're looking at about a
7 ten-to-one beta to gamma. That falls -- after
8 ten days it falls to about two-to-one, and then
9 at 1,000 days after detonation it peaks at what
10 appears to be about 80-to-one, and then at
11 10,000 days it falls back to about 11-to-one.
12 You can make of that what you will. I think
13 what Dr. Anspaugh said certainly has to be
14 taken into consideration, and I -- and I
15 suspect a lot of this beta in here, although
16 it's not documented what it is or what the
17 energies are, I suspect a lot of this might be
18 low energy beta.

19 **MR. ROLFES:** Okay.

20 **MR. ROLLINS:** So take that with a grain of
21 salt.

22 **MR. ROLFES:** Okay.

23 **MR. PRESLEY:** Sounds to me like that's all over
24 the table. Okay, we got a problem -- anybody
25 have a problem with that? I'm going to mark

1 that closed and -- and if -- if something comes
2 up down the road, then we can -- we can
3 certainly re-evaluate it.

4 **MR. CLAWSON:** Well, Bob, this -- this paper's
5 still coming out. Correct?

6 **MR. PRESLEY:** Right.

7 **MR. CLAWSON:** Okay. Well, I just -- that's
8 fine.

9 **COMMENT TWENTY: NON-USE OF BADGES**

10 **MR. PRESLEY:** Okay. Go with 20, there appears
11 to have been an internal non-use of badges in
12 some circumstances. And Mark has gone back and
13 looked -- and I'm going to let you go ahead and
14 tell what you've looked at and what you've
15 found on that. I find that data to be very,
16 very informative.

17 **MR. ROLFES:** A picture says a 1,000 words.

18 **MR. PRESLEY:** You got that right.

19 **DR. MAURO:** (Unintelligible) file so you're --
20 you're looking at that graph now?

21 **MR. ROLFES:** Yes, I -- I did just open the
22 attachment that was sent to you in the second
23 e-mail that I passed around.

24 **MR. PRESLEY:** Talk about figure 1 first?

25 **MR. ROLFES:** Yes, this -- I'm looking at figure

1 1, and this is the Nevada Test Site claimant
2 exposure by quarter from 1963 through 1966. At
3 the last working group meeting we had mentioned
4 that we were going to go back and take a look
5 into the claimant population to determine
6 whether there were individuals that had a
7 potential to be in a situation where they would
8 need to remove their dosimeter to avoid
9 exceeding an annual limit or a quarterly limit.
10 And what we have done here, if you take a look
11 at this first quarter -- or, excuse me, this
12 first figure here shows the number of
13 individuals that approached the 3,000 millirem
14 limit. And if you take a look, there's
15 approximately two individuals that were in a
16 potential to be exposed to 3,000 millirem in a
17 quarter.

18 **DR. MAURO:** I'm sorry, I'm looking at the --
19 there's a figure here -- I may -- I'm not sure
20 if I'm looking at the same thing you're looking
21 at. It's not -- the file I'm looking at -- it
22 starts off with a -- one of these three-
23 dimensional color pictures.

24 **MR. ROLFES:** Correct.

25 **DR. MAURO:** Is that what you're looking at

1 right now?

2 **MR. ROLFES:** Yes, that is correct.

3 **DR. MAURO:** Oh, okay, so I want to make sure --

4 **MR. ROLFES:** If you take a look at the two
5 highest peaks there, there's two peaks that
6 exceed 2,500 --

7 **DR. MAURO:** Okay.

8 **MR. ROLFES:** -- millirem, and those are the two
9 individuals that I was referring to approaching
10 the 3,000 millirem quarterly limit.

11 **DR. MAURO:** Okay.

12 **MR. ROLFES:** If you go on to the next figure 2,
13 it goes on and shows that there were three or
14 four individuals that were approaching the five
15 rem annual limit from '63 through '66.

16 **DR. MAURO:** Okay.

17 **MR. ROLFES:** And we've identified the
18 individual's doses here to basically show you
19 that there were not a large number of
20 individuals that were in a situation where they
21 would have needed to remove their badge to
22 avoid exceeding an annual limit for dose.
23 Let's see, we've also prepared a small write-up
24 as well, and if we have Mel on the line I guess
25 I'd like him to speak. I'm starting to get a

1 sore throat from speaking here a little bit and
2 my mouth's a little dry so -- actually before
3 we get into that, if you wouldn't mind, Bob,
4 could we take a break --

5 **MR. PRESLEY:** Yeah.

6 **MR. ROLFES:** -- or sometime in the near future?

7 **MR. PRESLEY:** Yeah. No, let's do it right now.

8 **MR. ROLFES:** Okay, great.

9 **MR. PRESLEY:** Does everybody want to take a
10 five-minute break and we'll start back up at 20
11 till? You can just mute your phone and we'll
12 not cut anything off.

13 **DR. BRANCHE:** Okay, 20 minutes till the hour,
14 Bob?

15 **MR. PRESLEY:** Yeah.

16 **DR. BRANCHE:** Okay.

17 **MR. CHEW:** I'm on the line, Bob, Mark --

18 **MR. ROLFES:** Okay, thank you, Mel. I'll be
19 back in about five.

20 **MR. CHEW:** Okay.

21 **MR. ROLFES:** Thank you.

22 **MR. PRESLEY:** Thank you.

23 (Whereupon, a recess was taken.)

24 **MR. PRESLEY:** Ready, Mark?

25 **MR. ROLFES:** Okay.

1 **MR. PRESLEY:** Discuss this write-up.

2 **MR. ROLFES:** Okay. If Mel's available and is
3 there back on the line, I'd like to have him
4 summarize the review that was conducted, if you
5 could, please.

6 **MR. CHEW:** Sure. The question -- the comment
7 came is were there any systemic or intentional
8 non-use of badges in some circumstances to
9 avoid approaching or exceeding the occupational
10 dose limits here. (Unintelligible) say this
11 practice might have occurred until the mid-
12 1960s or even extended into the '97 -- the
13 1970s. During the last meeting when this issue
14 was brought up and was both the -- also both
15 the -- a comment from SC&A and also it
16 addresses one of the comments that came up on
17 the SEC, so I think we're covering both
18 situations here. The -- the question really
19 comes up is that there was some -- there was a
20 worker interviewed that made some allegations
21 or assertions that this may have hap--
22 happened. NIOSH committed to look into how we
23 would evaluate and analyze information and so
24 we can addre-- properly address this particular
25 question and issue here.

1 The qua-- the time frame in -- in -- in --
2 right now is between 1963 to 1967 time -- 1966
3 time frame. And the reason why after 1966/'67,
4 the dosimeters -- the badge were incorporated
5 into the security badge and also was color-
6 coded and it was incumbent of the security
7 force to assure that the NTS workers were
8 wearing the latest color-coded badges that
9 would represent probably their monthly change
10 on their badge -- on their film badge. So
11 we're talking about a period between 1963 to
12 1966 where the dosimeters were worn as a
13 separate item on the -- on the clothing or on
14 the person here.

15 So what we did is that we tried to examine the
16 highest exposed NTS files that we have access
17 to and look how many of the claimants -- how
18 many -- how many of these particular files in -
19 - were inclusive of those dates that we're
20 looking at, 1963 to 1966 again. We came up
21 with about 93 individual files that really
22 represented a good cross-section of not only
23 the workers involved but the radiation
24 technicians and the -- some miners and the
25 tunnel people, so we -- we analyzed the proc--

1 the distribution of the people -- worker that
2 it -- this is truly representative. And we
3 came up with -- there was about 1,880
4 datapoints that we looked at, so it was not --
5 so ev-- every -- many of -- all these workers
6 and by and large who had their film badges
7 changed on a monthly basis, if not more, you
8 know, based on some specific incidents that
9 they were working on, a particular shot or
10 recovery that caused the -- the Reynolds
11 Electric folks to go ahead and change their
12 badge.

13 And the only -- the only really plausible
14 reason why a large group of workers would
15 misuse their dosimeters is that it would
16 preclude them from -- from working additional
17 radiation -- high radiation areas -- all
18 radiation areas and so therefore potentially
19 lose their potential income here. And at that
20 time, as you've shown on the graphs, the
21 applic-- applicable dose limits were 3 rem per
22 quarter and 5 rem per year. There were no
23 administrative controls at that time in place
24 during that particular time period here. And
25 so only the workers really who had really an

1 incentive to hide their real true dose and the
2 risk of being disciplined would -- would --
3 would probably have a reason for going ahead
4 and not wearing their dosimeters here.
5 Our analysis clearly shows that -- and remember
6 we looked at all these particular claims on a
7 mon-- every time they changed the badge, so
8 when you look at the particular file you can
9 actually even see how often that badge was
10 changed and -- and sometimes it was even more
11 than the month -- on a monthly basis here, but
12 certainly on -- when you look at their annual
13 records you can see that -- that they were --
14 had their badges changed on a very regular
15 basis here.

16 So we're looking to see if there was any
17 pattern and also to analyze what the maximum
18 exposures might have occurred during a
19 particular quarter which would give them an
20 incentive to not wear their badges here. So --

21 **MR. PRESLEY:** Hey, Mel --

22 **MR. CHEW:** Yes?

23 **MR. PRESLEY:** Hey, Mel?

24 **MR. CHEW:** Yes, sir?

25 **MR. PRESLEY:** This is Bob Presley. You all

1 continue. I have to go make another phone call
2 right here in a second and I'll be right back.

3 **MR. CHEW:** Okay. All right, Bob, I'll continue
4 here.

5 **MR. PRESLEY:** Thank you.

6 **MR. ROLFES:** Go ahead.

7 **MR. CHEW:** So what we did is that -- to clearly
8 demonstrate that the -- the -- the -- none of
9 the people -- none of the folks that we
10 examined even come cl-- will come close to
11 exceeding their quarter limit and not
12 (unintelligible) their annual do-- exposures,
13 too. As Mark said, only a few even came close
14 to on a quarter area, but the majority of them
15 actually received very low exposures for that
16 particular monthly change or on an annual basis
17 or on a quarterly basis here.

18 So the in conclusion, we'd like to propose that
19 the analysis of the data clearly demonstrates
20 that there was not a systemic pattern or any
21 real reasons for the Nevada Test Site people
22 that we looked at to remove their dosimeters to
23 -- in -- in order to continue working in the
24 radiation area. Not to preclude that there may
25 be some exceptions in this particular area, but

1 there was certainly not a systemic pattern.

2 **MR. ROLFES:** And one other thing I think is
3 important to point out, Mel, is that the
4 exposures that these people typically received
5 were received in a very short time period,
6 typically involved with a re-entry that
7 occurred over -- for example, a few hour time
8 period or up to two-day time period sometimes,
9 one or two days, rather than a chronic exposure
10 that a person would continually be exposed --
11 these -- these are simply acute exposures, so
12 there really wouldn't have been a time for an
13 individual to develop a pattern of improper
14 behavior and do this in a -- a continuing
15 basis.

16 **MR. CHEW:** Yeah, let me add to that, Mark.
17 Many occasions -- as you well know, the dates
18 are well-defined. We know what experiments or
19 what tests were conducted. You can certainly
20 see, even on some of the hi-- higher exposure
21 people that the badges were even changed either
22 for one day or two days apart here --

23 **MR. ROLFES:** Uh-huh.

24 **MR. CHEW:** -- and so that even validates what
25 you were just saying here, Mark.

1 **MR. ROLFES:** Okay.

2 **MR. CHEW:** Uh-huh.

3 **MR. PRESLEY:** This is Bob Presley. I'm back,
4 I'm -- I'm listening.

5 **MR. CHEW:** Uh-huh, I'm open to questions here.

6 **MR. CLAWSON:** Yeah, Mel, this is Brad Clawson.

7 **MR. CHEW:** Hi, Brad.

8 **MR. CLAWSON:** Explain to me how -- well, this
9 claimant identifier, did you just use claimants
10 that -- use their doses for this or was this an
11 overall general over the Nevada Test Site?

12 **MR. CHEW:** Well, we have -- we had some access
13 problems right now with the records center at
14 the -- at Nevada and so -- however, we were
15 able to certainly look at all the highest
16 exposures, the highest exposure of the 160 from
17 the direct claimant files. So yes, they are
18 from the claimant files.

19 **MR. CLAWSON:** Okay.

20 **MS. MUNN:** Those are the only ones that we're
21 interested in, in any case.

22 **MR. PRESLEY:** That's correct.

23 **DR. MAURO:** This is John, I -- I -- I'm going
24 to be a bit of a skeptic, so bear with me a
25 little bit.

1 **MR. CHEW:** Sure, John.

2 **DR. MAURO:** Now in looking at the data, it
3 looks like you have individuals -- in other
4 words, you -- I see there are about 100 claim--
5 claimant identifiers -- looking at the very
6 first graph --

7 **MR. CHEW:** (Unintelligible)

8 **DR. MAURO:** -- and -- and looking at it, what
9 it shows is that no one out of the 100 -- and I
10 believe these may have been the highest exposed
11 individuals out of the population of numbers
12 you looked at?

13 **MR. CHEW:** That's correct.

14 **DR. MAURO:** No one exceeded their -- the limit.
15 Could -- couldn't someone argue that this is
16 evidence that there was a practice of
17 deliberately avoiding these exposures,
18 especially when you say that the exposures may
19 have occurred acutely? You know -- what I'm
20 getting at is I don't know -- I mean -- please,
21 I guess I feel as though -- I -- I don't -- I
22 see what you've done here, and you're showing
23 that look, we took the highest 100 claimants --
24 exposures that we -- we were able to find in
25 the records out of I don't know how many

1 thousands you had mentioned that you looked at,
2 and you plotted the data by quarter for these
3 people, and no one exceeds the quarterly limit
4 of 300 (sic) millirem. And somehow you find
5 that as being compelling evidence that this
6 practice of deliberately leaving their badges
7 let's say back in their locker is -- that this
8 somehow provides evidence that -- that they
9 didn't do that.

10 **MR. SMITH:** John --

11 **DR. MAURO:** I have a little trouble with the
12 log--

13 **MR. SMITH:** John -- John, this is Billy.

14 **DR. MAURO:** Yeah.

15 **MR. SMITH:** If you look at table 1 --

16 **DR. MAURO:** Okay, let me go down to the table.

17 **MR. SMITH:** -- I think that's a better --

18 **DR. MAURO:** Okay.

19 **MR. SMITH:** -- description as to -- rather than
20 looking at the graphs (unintelligible) there
21 and seeing that nobody went over the limit.
22 But if you can look at those --

23 **DR. MAURO:** I'm on table 1 right now.

24 **MR. SMITH:** Yeah, table 1, if you look at the
25 means, the median and the 95th percentile -- of

1 course the bottom line just shows the maximums
2 that are shown on those particular plots.

3 **DR. MAURO:** Okay. These are quarterly doses,
4 distribution and numb-- okay, I'm looking at
5 it, '60-- 1963, quarter number one.

6 **MR. SMITH:** Right.

7 **DR. MAURO:** Okay. All right, let's -- let's
8 walk through that.

9 **MR. SMITH:** Okay.

10 **DR. MAURO:** Yeah, so -- okay, if you're looking
11 at the arithmetic mean, I see the arithmetic
12 mean out of the number of samples here is 131?

13 **MR. SMITH:** Right.

14 **DR. MAURO:** And the median is zero.

15 **MR. SMITH:** Right.

16 **DR. MAURO:** Okay, so 50 -- so basically what
17 you're saying, half the people, at least, had
18 no more than --

19 **MR. SMITH:** Doses were below zero.

20 **DR. MAURO:** Say -- sorry?

21 **MR. CHEW:** Let him finish, Billy.

22 **MR. SMITH:** Okay, go on.

23 **DR. MAURO:** No, no, I just want to read the
24 numbers and see if we're looking at the same
25 thing and -- so what we're saying is that half

1 -- half of the workers that were in this first
2 column had doses that were below the limits of
3 detection, and the maximum out of all these
4 people was 2 rem in that quarter.

5 **MR. SMITH:** Right.

6 **DR. MAURO:** Okay, and there -- and there was a
7 3 rem per quarter limit.

8 **MR. SMITH:** Right.

9 **DR. MAURO:** By the way, these numbers are very
10 consistent with the graph.

11 **MR. SMITH:** Right.

12 **DR. MAURO:** Okay. Now I guess -- now -- now
13 that we're -- understand that we're -- we're
14 looking at the same column, now you're saying
15 that somehow this is evidence that there was no
16 practice or systemic practice of -- of
17 deliberately leaving let's say badges in -- in
18 -- in the -- and I gue-- help me out with this,
19 I -- I want to -- I want to be convinced but I
20 haven't -- haven't yet.

21 **MR. SMITH:** Okay, look at the -- look at the
22 95th percentile column as you go across by
23 year, as an example. You know, you could look
24 at every quarter there and --

25 **DR. MAURO:** Yeah.

1 **MR. SMITH:** -- if you start with '63, you have
2 573, 730, 182 and 104.

3 **DR. MAURO:** Uh-huh.

4 **MR. SMITH:** So that simply says of course that
5 the doses that fall in that particular
6 percentile category were significantly less
7 than 3 rem a quarter numbers. I mean they
8 don't even approach the 3 rem per quarter
9 number.

10 **DR. MAURO:** Right, right.

11 **MR. CHEW:** John, I -- we -- we need to have a -
12 - an agreement that there -- there has to be a
13 reason for the people to do that. Okay? And -
14 - and -- and I think we addressed that as that
15 the reason is that the potentially would have
16 been received greater than the quarter exposure
17 -- quarterly limit exposure and would take them
18 out of potentially working and potentially loss
19 of income. So I think we're fundamentally --
20 have addressed there's -- there's a reason for
21 why the people want to do that.

22 The next -- there's a level of detail that is
23 not shown in this table that we actually
24 analyzed was when we actually look at the
25 individual files here. You could just see on a

1 given year or an -- on a given -- I'm sorry, on
2 a given individual, on a year, you could see
3 that that persons have the badges changed even
4 on a monthly basis, so you see numbers that are
5 on a monthly basis that -- and then adds up to
6 the quarterly exposure, too. So the monthly
7 one gives you really a -- a indication that if
8 a person says, you know, gee, I just got 50
9 this month and another 50 this month and
10 another 50 this month here, you know, what --
11 what is the real reason for not -- for going
12 over -- be concerned that they're going to go
13 over the quarterly limit here. Okay? And so I
14 think the fundamental thing we have to come to
15 agreement is that we -- we're trying to show is
16 that there was fundamentally not a real purpose
17 and a reason for why -- systemically why that
18 they would need to do this.

19 **MS. OWENS:** This is Kathleen from Senator
20 Reid's office. Can I perhaps add something
21 here?

22 **MR. CHEW:** Sure.

23 **MS. OWENS:** You're asking for reasons, you
24 know, and I believe this is the only issue
25 that's being looked at, but I have heard from

1 many workers who also didn't wear their badges
2 for fear of damaging them in terms of, you
3 know, trades workers. I'll give you one
4 example, one of the petitioners, for example,
5 he would get sparks on it and so, you know,
6 they didn't want to damage the badges,
7 supervisors looked down upon this in terms of
8 having to do more paperwork. Has this been
9 looked at, and I've heard this from many
10 people, not just perhaps one person.

11 **MR. CHEW:** Billy, I mean you might
12 (unintelligible) since you were part of the
13 dosimetry on (unintelligible) maybe address
14 that.

15 **MR. SMITH:** Kathleen, I don't -- I'm not aware
16 of people taking off their badges for any
17 reason, and -- and I certainly hadn't heard of
18 anybody taking off their badge for fear of
19 damaging them.

20 **MS. OWENS:** I -- I guess this is maybe more
21 particular for the SEC, but I -- one of the
22 affidavits in the SEC petition quite clearly
23 states that.

24 **DR. MAURO:** Yeah, this is John. I -- I have to
25 second that. The reason I am paying a lot of

1 attention to this particular issue, it is -- it
2 certainly has applicability to the dose -- the
3 site profile, but it is probably the most
4 important problem or issue associated with the
5 SEC. There are -- there are ten affidavits
6 that were filed and the -- the affidavits are
7 very compelling that there was in fact some
8 widespread problems, and in fact the very
9 reason that we just heard, beside approaching a
10 max -- it sounds like even there was a -- more
11 reason was that -- that the -- they get --
12 there's a problem in terms of the -- this --
13 the -- they get dirty and they left -- and
14 there was a -- and it -- it sound like from
15 looking at the affidavits, quite frankly just
16 trying to look -- read the story told, and it
17 sure sounds like there was a lot of that going
18 on, leaving it behind. And if that one worker,
19 and I have to go look again, and this may be
20 another way to get a hook on this, claimed that
21 he routinely left his badge behind, but he did
22 wear a pocket ionization chamber, and in -- and
23 he was -- and in fact he talked about a
24 particular circumstance where his pocket
25 ionization chamber read very high, I think it

1 was 5 rem, and -- but -- but he left his badge
2 behind. So the -- this seems to be -- one of
3 the things I would want to do of course is see,
4 you know, if there's any way to track -- say
5 okay, the -- here's -- here's a bunch of pocket
6 ionization chamber readings that were -- that
7 were read out -- I don't -- I don't know if
8 these are in the records -- I mean this would
9 be almost like the prima facie evidence of yes
10 or no whether this was going on if -- if there
11 is a record of the PIC readings and -- and if
12 the same -- in that month let's say you find
13 that yeah, this person has a record in the log
14 somewhere that says the -- the -- the pocket
15 ionization chamber read whatever numbers are in
16 -- are in the record, we -- recognizing that
17 pocket ionization chambers are not as --
18 anywhere near as reliable as a film badge, but
19 then looking at the film badge records and if
20 you see for that month it is reading of zero
21 and -- and this is basically what's being
22 claimed in some of these SEC affidavits, that
23 would -- you know, for -- if that's -- if we
24 see that -- I'm looking at a way -- you see,
25 this is an indirect way, and I understand your

1 argument, the table 1 that we're looking at.
2 But then I read that -- I have to say, after
3 reading that petition I said hmm, oh, my
4 goodness, I would sure like to find out whether
5 or not for this particular person that ga--
6 gave this particular claim in his affidavit,
7 whether or not his -- his actual dose in that
8 month when -- you know, was re-- recorded as
9 zero, but his PIC he claims has recor--
10 recorded at least, on one day, five -- five R,
11 there may be -- that may be a direct way --
12 does anyone know on the phone whether or not
13 pocket ionization handwritten logs are -- are
14 maintained somewhere --

15 **MR. SMITH:** This is Billy, John.

16 **DR. MAURO:** Yes?

17 **MR. SMITH:** Yes.

18 **DR. MAURO:** Yes.

19 **MR. SMITH:** There were logs maintained of any
20 PIC readings that people exiting an area --
21 they were recorded on logs and those records
22 would be maintained at the records center.

23 **THE COURT REPORTER:** Excuse me, was that Mr.
24 Smith?

25 **MR. SMITH:** Yes.

1 **THE COURT REPORTER:** Okay, I just wanted to
2 make sure. Thank you.

3 **MR. SMITH:** Who was that?

4 **THE COURT REPORTER:** This is the court
5 reporter.

6 **MR. SMITH:** Oh, I'm sorry.

7 **DR. ROESSLER:** Who was the person who talked
8 before that?

9 **DR. MAURO:** John Mauro.

10 **DR. ROESSLER:** Okay, but there was somebody
11 else I think that --

12 **MR. ROLFES:** Billy and Mel Chew.

13 **DR. ROESSLER:** But it was probably Mel
14 answering the PIC question.

15 **MR. SMITH:** No, that was me, Billy.

16 **MR. ROLFES:** That was Billy Smith.

17 **DR. ROESSLER:** Billy, okay, thanks.

18 **MR. SMITH:** Okay. Yes, we did maintain logs of
19 people exiting areas where they wore PICs, and
20 those records are available. Haven't looked at
21 them from the respect -- from the perspective
22 that John just mentioned. That would be an
23 interesting view. But one of the things that,
24 you know, you need to recognize is that when
25 these people worked in these radiological areas

1 where there was potential exposures and they
2 had to wear PICs in -- associated with those
3 dosimeters, that was one of the methods we used
4 to determine whether or not they would need to
5 get dosimeters changed, badges changed, on a
6 more frequent basis than monthly.

7 **MR. ROLFES:** In addition -- yeah, the real time
8 monitoring is documented by one of the health
9 physicists that we spoke with. Real time
10 monitoring was in fact done for individuals
11 that were in a position to be exposed to high
12 dose rates -- for example, on re-entries. So
13 an individual working in a high dose rate area
14 would have had radio communications with
15 someone who was observing his recorded dose or
16 his exposure on a real time basis.

17 **MR. SMITH:** The other thing that took place is
18 while these people were working in those areas
19 WSI security had a very, very high presence in
20 these areas and one of the reasons why it -- it
21 -- it doesn't seem reasonable to me that people
22 would be allowed to take off their badges is
23 that because, you know, if they did, then it
24 would have been a security violation and they
25 would not have been able to work in them.

1 **MR. CHEW:** Billy --

2 **MR. SMITH:** Yes.

3 **MR. CHEW:** -- let me -- I don't want to put
4 words in your mouth, but maybe you can answer
5 this question here. Let's focus in on the time
6 frame, the '63 to '66 --

7 **MR. SMITH:** Okay, in the --

8 **MR. CHEW:** -- 'cause I think '67 afterward --

9 **MR. SMITH:** The dosimeter and the security
10 credentials were separate at that time.

11 **MR. CHEW:** At that time there was clearly some
12 of the REECo rad safe staff present when -- you
13 know, in high radiation areas and people
14 potentially wearing pocket dosimeters 'cause
15 that's who issued them. And so were the rad
16 safe monitors, the RCTs, part of their
17 responsibility to assure that they were also --
18 that people were wearing those --

19 **MR. SMITH:** Of course.

20 **MR. CHEW:** -- film badges in addition to the
21 PICs, too?

22 **MR. SMITH:** Yes.

23 **MR. CHEW:** Okay. I was hoping you would say
24 that.

25 **DR. MAURO:** Now I don't know --

1 **MR. CLAWSON:** Let me ask, John, I've got a
2 question. You're telling me of course you've
3 got a check-off list that you checked each one
4 of those had a badge. Let me ask you this.
5 Did you check to make sure they had any kind of
6 crystals in them --

7 **DR. MAURO:** Oh, I didn't check --

8 **MR. CLAWSON:** -- or anything else like that?

9 **DR. MAURO:** Oh, I didn't go back to his -- no,
10 this is basically a que-- see, I know -- there
11 are these af-- ten affidavits. I didn't go
12 back to their dose reconstructions or their
13 records. We didn't do any of that. We -- we
14 have not been authorized to do that. All we've
15 been authorized to do is to review the
16 affidavits and the information that's available
17 to us as part of the SEC review. And when I
18 see a person that claims that he left his badge
19 in the locker room and went in because of the
20 concerns that were mentioned earlier, getting
21 it dirty, the -- the sparks, and also high
22 exposures -- potential, but did report that he
23 had this very high PIC reading on his pocket
24 ionization chamber, one -- one thing I would do
25 immediately but which I haven't done is simply

1 say okay, any way we can zero in on the date --
2 the date when that PIC was -- when he claims
3 that he received that high exposure reading,
4 and then go and look at his film badge reading
5 for that month. And if he got -- if he saw 5
6 rem or R on his pocket ionization chamber and
7 there's a zero in his -- his data for his film
8 badge reading for that month, something doesn't
9 look right and maybe his claim is valid. Maybe
10 his --

11 **MR. CHEW:** And we have to be -- caution, too,
12 John, as you well know, you know, pocket
13 ionization chambers are susceptible to doses --
14 I mean to -- to discharges that potentially
15 give false readings --

16 **DR. MAURO:** And I --

17 **MR. CHEW:** -- (unintelligible) factor that in,
18 too.

19 **DR. MAURO:** And I agree with that. Now the
20 things is -- now if there are -- let's say it
21 turns out -- that's why I asked the opening
22 question was if there's a record maintained of
23 the pocket ionization chamber readings, and
24 let's say we went in and randomly grabbed ten
25 of them out of -- just randomly grabbed --

1 don't even look at anything but just randomly
2 grab some positive readings, and let's say just
3 take ten of them, then go back and say okay,
4 and let -- these are positive readings now so
5 you're going to see some number above zero.
6 Then go back -- just go grab these same
7 people's month-- monthly film badge readout,
8 and if in all cases they read zero and -- while
9 the pocket ionization chambers that you picked
10 for these people read something positive, I
11 would -- I would -- then -- and then I would
12 say you know something, these folks have a --
13 have a -- make an as-- sounds like there's a
14 legitimate claim here.

15 **MR. CHEW:** Sure, it doesn't add up, yeah.

16 **DR. MAURO:** Yeah, it doesn't add up --

17 **MR. CHEW:** (Unintelligible) I agree.

18 **DR. MAURO:** -- and -- and then they say -- but
19 if you look at ten and in all cases the film
20 badge gave a positive reading -- may not be
21 exactly the same as the pocket ionization
22 chamber --

23 **MR. CHEW:** Sure.

24 **DR. MAURO:** -- reading is, you wouldn't expect
25 it to be, but you would like -- you expect that

1 if you did get a positive on the pocket
2 ionization chamber, you would get a positive on
3 the -- on the film badge, and -- and if you see
4 that and in all ten you do get a positive
5 positive, I would say hmm, you know, maybe this
6 wasn't a widespread practice if it existed. So
7 to me, that goes -- the only reason I'm -- I'm
8 bringing this up is that this is the essence of
9 the SEC petition, and -- and this -- and right
10 now the -- this type of analysis, though it
11 goes towards that concern, I -- I would say if
12 what I just described sounds reasonable to
13 everybody on the phone, this is certainly
14 something that might be a good thing to do.
15 Not SC&A, for NIOSH to do, to put this problem
16 and answer this question because the affidavits
17 -- these folks that wrote those affidavits are
18 very detailed and they're convinced that this
19 was a widespread practice, so they're coming --
20 their position -- these workers are -- are --
21 definitely believe that there was this
22 widespread practice. I remember [Name redacted
23 was one time spoken to about this.
24 Unfortunately he has passed on. He also said
25 it was a widespread practice, and I think we --

1 we have an obligation to let -- let's really
2 put this one to bed. And if we can do that by
3 looking at the PIC data and -- and almost like
4 a blind test to see what the film badge
5 compared to the PIC, that might be one way to
6 get a real handle on this and put this issue to
7 bed the right way.

8 **MR. CHEW:** John, I -- this is Mel. I like what
9 you're saying. Let me propose this, that NIOSH
10 and the ORAU team go back and come up with a
11 spot so we can think this out and so we can
12 really address this because you -- you clearly
13 say that this is a very important issue here
14 and so we'll come up with some method --
15 methodology to try to address this issue
16 adequately, taking into consideration what you
17 have suggested here.

18 **MR. ROLFES:** Before -- before we agree on
19 anything -- this is Mark -- and I wanted to ask
20 Billy a question. For an individual that would
21 have damaged his dosimeter or his film badge
22 associated with, you know, welding or getting
23 sparks on the film badge, burning a hole in it,
24 would something like that, if that occurred,
25 would that be documented in the individual's

1 file?

2 **MR. SMITH:** Yes.

3 **MR. ROLFES:** Okay. So if we had documentation
4 then of an individual that had damaged his
5 badge, if we had that indication and he was the
6 same one that was making the statement that he
7 was told -- or asked to remove his dosimeter,
8 then that would certainly be a number one
9 identifier that would, you know, attract our
10 attention to such an issue.

11 **MR. SMITH:** Yes, that would be --

12 **MR. ROLFES:** And then -- and then in that case
13 it would give us a path forward for assigning a
14 dose to that individual.

15 **MR. SMITH:** I have a comment to John relative
16 to the petition that you were talking about,
17 not the -- not the overall SEC petition but the
18 claimant statement that he got 5 --

19 **DR. MAURO:** R.

20 **MR. SMITH:** -- R on his badge and he was a
21 welder. I mean as a health physicist, does
22 that make sense that a guy would be welding in
23 an area, creating vapors in a radiological area
24 and that -- that there was not any other people
25 around doing the proper air monitoring and

1 personnel monitoring?

2 **DR. MAURO:** There -- there are a lot of reasons
3 not to believe that statement, that he received
4 5 R. In other words, I'm not disagreeing that
5 there are reasons -- but then again, the
6 statement is made in an affidavit and it's a
7 re-- and it's a -- a recurring issue. I just
8 used that as one example of one that -- there
9 are nine others that have stories that are
10 attested to, and then of course we have the
11 statements made by Mr. Brady that this was a
12 widespread practice, and I -- and I think that
13 we have -- I think that if there's another way
14 to come at this problem that might be a little
15 bit more direct in order to really put this
16 thing to bed, I think we should do it. I'm
17 sorry to be so -- I mean I'm -- I -- I feel as
18 if the data analysis that was just done goes
19 toward that, but there are other things that
20 could be done -- probably fairly expeditiously,
21 unless I'm wrong -- that could really answer
22 this question to the satisfaction of everyone,
23 including the folks -- you know -- you know,
24 who are con-- concerned this was a widespread
25 issue. It may turn out that it's not -- was

1 not a widespread issue and such an analysis
2 might actually show that. So I'm not -- I'm
3 not saying that I necessarily believe the
4 person actually experienced 5 R any -- in one -
5 - in one day. I don't know if that's -- if
6 that's real. But I think that -- that this --
7 this recurring theme needs to be more directly
8 addressed and I -- I'm only saying this because
9 I'm right -- involved up to my eyeballs in the
10 NTS SEC petition review.

11 Along these same lines --

12 **MS. MUNN:** Which -- which period? Which time
13 period, John?

14 **DR. MAURO:** Pardon me? Who --

15 **MS. MUNN:** Which time period?

16 **DR. MAURO:** Oh, this is -- this is post-'62.
17 This is -- this is during -- this is -- now I
18 don't know for this particular worker what year
19 that was, but it -- this is all when the below-
20 ground testing was -- not during the above-
21 ground, so we're talking post-'62. That's --
22 and the reason that's the case is because
23 that's the SEC petition, it's for post-1962 --

24 **MS. MUNN:** Right, right.

25 **DR. MAURO:** -- and so this worker and the other

1 nine affidavits all go toward that time period.
2 Now what the particular year is when this
3 occurred, whether it occurred during the '63 to
4 '67 period or occurred a later period, I don't
5 know.

6 **MS. MUNN:** But it was post the existing SEC,
7 that -- that was the only question.

8 **DR. MAURO:** Ye-- yes, it was -- the existing --
9 not the old -- not the one that's been awarded
10 but this is the new one.

11 **MS. MUNN:** Uh-huh.

12 **DR. MAURO:** Now there's one more thing that I
13 think is important that I think is a source to
14 get a handle on this, and bear with me. In the
15 S-- in the SEC there is -- the evaluation
16 report -- the evaluation report explicitly
17 tries to address this issue. And what it does
18 is it has a table in it, and it says okay, we
19 looked at 1,200 CATIs for -- for -- taken --
20 you know, CATI reports taken from claims, and
21 we also, independent of that -- this is NIOSH's
22 report -- said that we interviewed I think it
23 was 14 or 15 people.

24 **MR. ROLFES:** Yes, that's correct.

25 **DR. MAURO:** Right. And the outcome of that --

1 and this is really a question. The outcome of
2 that was you fou-- you observed thir-- you got
3 13 hits, namely -- and what I mean by hits is I
4 think the number was 13 individuals said yes,
5 we did leave our film badges behind at -- so --
6 and the argument was made that well, 13 out of
7 on the order of 1,200 shows that, if it did
8 occur, it was very rare.

9 Now my -- so I think the idea that that was
10 done, that phone calls were made -- other
11 words, you looked at the CATIs and that you
12 also did separate telephone calls to -- I
13 believe it was 14 or 15 people specifically
14 asking that question in the phone calls -- not
15 in the CATI. Remember, the CATI does not ask
16 that question. Certainly it might come out in
17 -- during the CATI interview, but there's no
18 question in the CATI that says did you, you
19 know, leave your badge behind. But -- but so
20 they actually -- NIOSH actually called up 15
21 people or 14 people, and the outcome, though,
22 was 13 hits.

23 My question is that -- did those 13 hits occur
24 in the -- did most of those hits occur in the
25 results of looking at the CATI, or did a

1 significant number of those hits occur as a
2 result of the 15 people that were called up.
3 Right now I think that, you know, you read that
4 and you say we got 13 hits, but if the 13 hits
5 came from the 14 or 15 people that were called,
6 that changes the complexion --

7 **MR. ROLFES:** Sure --

8 **DR. MAURO:** -- of (unintelligible)
9 considerably.

10 **MR. ROLFES:** -- sure, certainly, and I'd be
11 happy to provide that information to you. And
12 in order to answer that question, none of the
13 15 individuals that interviewed -- that we
14 interviewed said that they had defeated the
15 badging or had directly seen anyone do this.

16 **DR. MAURO:** Okay, that's important. We didn't
17 --

18 **MR. ROLFES:** They were --

19 **DR. MAURO:** -- I appreciate that information
20 because that was our first concern. We'd like
21 to know where -- where are they -- so the hits
22 occurred -- something that emerged from the
23 1,200 CATI interviews.

24 **MR. ROLFES:** There were two people that had
25 reported that they had heard third-hand that

1 this was done on site, but none of the 15 had
2 direct knowledge of this occurrence. So these
3 are second- and third-hand reports of -- of
4 this occurrence.

5 **DR. MAURO:** Well, I mean just from a
6 statistical point of view, I am encouraged that
7 out of the 14 or 15 people that I assume you
8 randomly called, you got zero hits. If there
9 was a widespread practice, you know, one would
10 expect more -- you know, at least one or two
11 hits, but I'm glad you gave me that
12 information. I didn't know that. See, that's
13 the kind of information that I see that goes
14 directly towards this issue as oppo-- you know,
15 and is very, very helpful in helping to come to
16 grips with this, not only for the site profile
17 but also for the SEC.

18 **MR. PRESLEY:** Okay, are there any more
19 questions?

20 **MS. MUNN:** This is really a thorny issue, and -
21 -

22 **MR. PRESLEY:** This is -- this is something that
23 is going to have to be -- as far as I'm
24 concerned, going to have to be done on a --
25 almost on a case-by-case basis.

1 **MS. MUNN:** Well, you know, it's the -- I -- by
2 the time the 1960s rolled around, people who
3 worked on these sites were not babes in the
4 woods. No one that I knew during the 1960s was
5 unaware of the potential involved in radiation
6 exposure. It was a well known, well
7 documented, quite reasonably understood
8 phenomenon. And the reason for badging would
9 have been obvious to anyone. Not only that, it
10 was not a period of deprivation in the United
11 States. It isn't as though anyone working on -
12 - out in the middle of the Nevada desert in the
13 extreme hot, extreme cold, terrible conditions
14 couldn't have found a job somewhere else. It's
15 -- in order for this kind of thing to have
16 occurred systemically, it boggles the mind as
17 to how many individuals would have had to be
18 complicit in having it happen. You would have
19 to have the worker. You would have to have the
20 worker's supervisor. You would have to have
21 the security and health physics people. And
22 you would have to have all coworkers.

23 **DR. MAKHIJANI:** This is Arjun. I'm back.

24 **MR. PRESLEY:** Thank you, Arjun.

25 **MS. MUNN:** It just -- well, the suggestions

1 that have been made are good ones. I just
2 could not keep making that observation. It
3 seems very difficult, but certainly if we can
4 track it to ground and it can be done with a
5 relative short period of time, then certainly
6 in the context of the SEC that needs to happen.
7 But in the interim, thank you to those of you
8 who have put together the information that we
9 have. It's most informative.

10 **MR. CLAWSON:** And Wanda -- this is Brad -- and
11 to your comments, you're talking back in these
12 days -- and I can tell you today that we're
13 still fighting with these issues. And as far
14 as the security badges go and so forth like
15 that, my TLD is different than my security
16 badge. There's many, many different things
17 that push people into this. And I can sit
18 right now -- I have a new work force that is
19 coming in that actually scoffs at me and laughs
20 about some of our contamination issues and
21 radiation issues because they -- they don't
22 believe them. There's -- there's a lot of
23 issues that play into this, so don't think that
24 because of the issues that have arisen because
25 of these petitions and everything else like

1 that that this problem has stopped, because it
2 still happens now.

3 **MS. MUNN:** Hmm, I'm (unintelligible) --

4 **MR. SMITH:** This is Billy Smith. One -- one --
5 one fact that -- that stands out to me over the
6 period of operation of the Nevada Test Site
7 through the present, over a million individual
8 dosimeters have been issued, and less than one
9 percent of that number had any positive gamma
10 dose on them at all.

11 **MS. MUNN:** Uh-huh.

12 **MR. ROLFES:** That's very helpful to know,
13 Billy. That's --

14 **MR. PRESLEY:** I appreciate that, Billy, very
15 much.

16 **MR. CLAWSON:** You're -- you're telling me one
17 million badges and you've only got one percent
18 that got any kind of dose?

19 **MR. SMITH:** Less than one perc-- less than one
20 percent received any type of gam-- of -- of
21 radiation exposure.

22 **MR. ROLFES:** That certainly does make sense
23 based on the limited number of exposures that
24 occurred at the Site. Once again, this is not
25 a production facility where there's a

1 continuous exposure potential, but rather it's
2 -- it's an acute exposure potential associated
3 with and shortly following after a test. And
4 once again, as we had mentioned before in the
5 analysis that was completed, most of these
6 exposures that we're seeing were received in,
7 for example, an acute manner in one- or two-day
8 time period. So that -- that really does make
9 sense to me from -- you know, from a knowledge
10 of the operations.

11 **DR. MAKHIJANI:** But by the same token then,
12 Mark, you know, a global analysis -- a global
13 analysis of badges in the way that you present
14 it rather than -- I had thought that there was
15 going to be an analysis of a particular group
16 of workers in a particular -- in the -- in --
17 in -- in that period of time, which was the
18 tunnel re-entry workers rather than all of
19 them. I haven't had a chance to study what you
20 sent, but I thought you -- you essentially put
21 all the badges together, which -- which throws
22 in the non-testing periods and the testing
23 periods and the workers who were in the forward
24 areas and those who were not in the forward
25 areas.

1 **MR. ROLFES:** No, we --

2 **DR. MAKHIJANI:** That's what I understood Jim
3 Neton to say in the last working group meeting
4 is that you would look at the workers who were
5 in the forward areas.

6 **MR. ROLFES:** What we have here was the time
7 period of 1963 through 1966 --

8 **DR. MAKHIJANI:** Right.

9 **MR. ROLFES:** -- and it was 160 of the highest
10 exposed claimants that we have from Nevada Test
11 Site; 94 of those 160 were within the 1963 to
12 1966 time period, so those are the individuals
13 that we focused on.

14 **DR. MAKHIJANI:** Yeah, yeah, but that's
15 different than what I'd thought Jim Neton was
16 proposing is to look at -- because this thing
17 has really mostly arisen, at least in terms of
18 the testimony that has been given, apart from
19 the atmospheric testing period which -- which
20 to some extent is moot because of the SEC -- is
21 -- is the tunnel re-entry workers. This is --
22 this has arisen both in the testimony that's
23 been presented before the Board, some
24 documentary evidence and so on in -- in that
25 context. And if I remember what Jim Neton had

1 proposed is what you were going to do is to
2 look at that group of workers to see if -- if
3 there was an issue with -- with their records,
4 their CATIs, their affidavits, their dosimetry,
5 and I don't know exactly -- I don't know that a
6 -- a -- a plan of research was set forth at the
7 last working group meeting, but the group of
8 workers had been defined.

9 **MR. ROLFES:** Well, I feel that --

10 **DR. MAKHIJANI:** Not (unintelligible).

11 **MR. ROLFES:** I really can't think of any other
12 exposure scenario other than -- you know, the -
13 - the highest exposed individuals would have
14 been captured in this -- in this study that we
15 have done.

16 **DR. MAKHIJANI:** You're -- you're talking about
17 the highest recorded badges. We're not talking
18 about the highest recorded badges, which is the
19 data that you've presented. What -- what we
20 were talking about is to look at what might be
21 a pattern -- I mean a worker might leave their
22 badge off entirely if they anticipate a high
23 exposure 'cause they don't want to be sent
24 back. I mean I -- I had -- at least this was
25 my understanding and -- and -- that -- that

1 NIOSH was going to look at a group of workers,
2 not at a group of high exposed claimants but at
3 a group of tunnel workers and look at their
4 records.

5 **MR. ROLFES:** Well, once again, this highest
6 exposed group is comprised of several people
7 who were involved in tunnel re-entry.

8 **DR. MAURO:** Arjun, I -- during the disc-- what
9 -- during your absence --

10 **DR. MAKHIJANI:** Yeah, I'm sorry that I --

11 **DR. MAURO:** Yeah, it's okay, but --

12 **MR. CLAWSON:** This is -- this is Brad. I hate
13 to -- I -- I've got some -- I've got a lot of
14 people waiting on me to do a job. I didn't
15 think that this was going to take this long. I
16 have got to -- I've got to step off right now.
17 I've got some work that has to be done. I
18 apologize, but I've got several people waiting
19 on me, so Bob, I apologize but I've got to --
20 I've got to stop right now and go take care of
21 some work right now.

22 **MR. PRESLEY:** Okay.

23 **MR. CLAWSON:** I apologize.

24 **MR. PRESLEY:** I understand.

25 **MR. CLAWSON:** Okay.

1 **MR. PRESLEY:** We've got about an hour before
2 I've got to go.

3 **MR. CLAWSON:** Okay, we'll see you later.

4 **MR. PRESLEY:** Now.

5 **MR. ROLFES:** John, I think Arjun came back in -
6 -

7 **DR. MAURO:** Yeah.

8 **MR. ROLFES:** -- after your discussion, if you
9 want to --

10 **DR. MAURO:** I just wanted to bring -- this is
11 something I want to put out for just
12 consideration. It's an idea that I came up
13 with. In reading the affidavits -- and Arjun,
14 I just mentioned this -- this be-- before you
15 came on -- that we have an individual who turns
16 out wore a pocket ionization chamber, and I
17 found out that -- that the -- this is -- a lot
18 of folks wore pocket ionization chambers, and
19 there are records of what their readings are
20 from the pocket ionization chambers. And in
21 theory you can go back and randomly sample all
22 of the positive readings and maybe -- from --
23 that -- where there are pocket ionization
24 chamber readings, and they're in the records,
25 and then go back to that person's film badge

1 record history and see if that month he had a
2 zero, the month where the pocket ionization
3 chamber read something positive, and see if the
4 -- that same very month he has a zero on his
5 film badge reading. That would -- and if that
6 happens, and it happens a lot, well, it sounds
7 like there's something fishy going on. If it
8 turns out that whenever you get a -- a positive
9 pocket ionization chamber reading, you get --
10 you more or less -- or out of the let's say
11 ten, 20, 30 samples, you also get a positive
12 film badge reading, it's not going to be the
13 same, it seems to me that kind of analysis --
14 unless I'm missing something -- would really
15 put this issue to bed, one way or the other.

16 **MR. PRESLEY:** This is Bob Presley. We're going
17 to beat this one to death. I'm going to ask
18 Mark if he would go back -- Mark, how long is
19 it going to take to do something like there to
20 where that you can get your hands on those
21 pocket dosimetry -- those things and then look
22 and see what the -- if it corresponds in any
23 way to the badge readings.

24 **MR. ROLFES:** Well, we are trying to be -- you
25 know, we are trying to work within a set amount

1 of time and trying to provide responses to
2 claimants in a timely manner. This is
3 something -- if we're referring to a million
4 film badge results, I certainly expect there's
5 at least that many pocket ioniza-- ionization
6 chamber results.

7 **MS. MUNN:** I think what we're talking about is
8 a random sample of pocket ionization results
9 that can be correlated to the same individual's
10 film badge for that period, and I heard the
11 number suggested 20?

12 **DR. MAURO:** And that -- this is a question I
13 guess a statistician -- you know, what kind of
14 sense of a power we're looking for, I don't
15 know. I'm just saying that you only need-- you
16 don't need that many, and if you get -- you
17 know, if you could randomly select ten, 20 or
18 whatever number that is deemed appropriate of -
19 - of the positive, you start with the -- you
20 want to get positive readings of pocket
21 ionization chambers, and these would just be
22 for a given day, and then -- and you got a
23 positive reading. Then you go back to the --
24 for that person, that -- the month in which
25 that day got that reading and see if he got a

1 positive reading, or did he get a zero.

2 **MR. CHEW:** I agree with you, John, I think the
3 first -- first order of business to see if we
4 can retrieve the records of the pocket
5 ionization chambers and look at the positive
6 ones. I -- I think that's the right approach
7 here, just talking about how we're going to go
8 forth (unintelligible).

9 **MR. PRESLEY:** Would we want to look at them
10 random, or would we want to pull say 20 high
11 doses and look and see if -- if you know you've
12 got a positive high, then there should be a --
13 at least something on that film badge.

14 **DR. MAURO:** Yeah.

15 **MR. PRESLEY:** Now if we do that and it's on 20
16 of those film badges, then I'd say we don't
17 have a problem. If you look at 20 and say
18 okay, ten of these pocket ionization chambers
19 have a high reading but their badges say no
20 reading, then yeah, we've got a problem.

21 **MR. ZLOTNICKI:** This is Joe Zlotnicki with
22 SC&A. I've got a question on this and that is
23 is there any indication that the workers in
24 general in these affidavits say they didn't
25 wear their film badge; they say they did,

1 however, wear their PIC, or were they likely to
2 leave both of them off?

3 **DR. MAURO:** I -- I brought this up, Joe,
4 because there was one affidavit where this was
5 the claim made by the worker, that he had his
6 PIC, he got a very high reading on his PIC, but
7 he left his film badge behind.

8 **MR. ZLOTNICKI:** Yeah, I heard -- I heard you
9 say that, but --

10 **DR. MAURO:** Oh, okay.

11 **MR. ZLOTNICKI:** -- I'm wondering in general --

12 **DR. MAURO:** Oh.

13 **MR. ZLOTNICKI:** -- in these other affidavits if
14 people are claiming that they still wore their
15 PIC and that that dose got recorded. It would
16 seem if people were leaving their film badge
17 off and wearing a PIC and getting a result,
18 they were laying themselves open to be sort of
19 discovered.

20 **MR. PRESLEY:** That's exactly --

21 **MR. ZLOTNICKI:** So I'm wondering if they would
22 leave all dosimetry off if they're intending to
23 leave any off deliberately.

24 **MR. ROLFES:** Well, this is Mark, and for this
25 particular individual, what might be best

1 helpful for us in directly analyzing whether
2 this situation occurred and if any significance
3 -- any significant dose was received by the
4 individual, maybe we could get -- you know,
5 maybe we could speak with him and get
6 authorization to retrieve his records and take
7 a look at the specific, you know, time period
8 that this occurred and also take a look at what
9 kind of radiation exposure environment this
10 individual was in. That might give us our most
11 straightforward answer.

12 **DR. MAURO:** I agree, we should start -- well,
13 you folks should start with the affida-- the
14 people who claim -- who made the affidavits and
15 -- and it sort of -- you know, convince
16 yourself that gee, this has really happened.

17 **MR. PRESLEY:** I've got no problems with that.
18 This is Bob Presley. Wanda, what would you
19 agree?

20 (No responses)

21 Gen?

22 **DR. ROESSLER:** I think if the information is
23 available, that's the very first place to
24 start.

25 **MR. PRESLEY:** Okay.

1 **MR. SCHOFIELD:** Yeah, I -- I agree with that,
2 too.

3 **MR. PRESLEY:** Okay.

4 **MS. MUNN:** (Unintelligible) a good idea, John.
5 I hope it doesn't take us down an unproductive
6 path.

7 **DR. MAURO:** Well, you know what it is is -- in
8 reality is this is more an SEC issue than it is
9 -- I mean the -- the immediacy of this is
10 apparent. It is the heart and soul of the
11 issue. And the fact that we're engaging it
12 here in the site profile I have to -- I -- I
13 apologize for bringing it up, but it's so -- so
14 fundamental that I -- I -- you know, I couldn't
15 help myself.

16 **MR. PRESLEY:** Let me ask you something -- this
17 is Bob Presley. Did we not talk about setting
18 a working group up to look at this problem? I
19 don't think we ever did; I know we talked about
20 it. But -- because this is such a widespread
21 problem --

22 **MS. MUNN:** Well, it recurs on every site.

23 **MR. PRESLEY:** -- it recur-- recurs at every
24 site.

25 **MR. ROLFES:** I know that it was evaluated in

1 detail for the Rocky Flats site as well, and I
2 know that it's come up with Nevada Test Site
3 and other sites as well, so --

4 **DR. MAURO:** Yeah, we never -- I've got to say
5 that the only reason I -- the idea came about
6 the PIC, I don't think we ever talked about the
7 -- that the -- the pocket ionization chambers
8 may be the ultimate solution. I'm not sure if
9 it is. May turn out that it's not going to
10 work. You know, they -- the rea-- you know,
11 and -- but it seems to be at least an idea that
12 might give us a handle on one of the most
13 difficult problems we've been trying to deal
14 with.

15 **MR. ROLFES:** Uh-huh.

16 **MR. SCHOFIELD:** Right, Nevada has things -- two
17 things, one, the fact that they did actually
18 record these PIC values, which is something
19 that I -- I can say from personal experience
20 they did not do in Los Alamos. Plus, the film
21 badge and your badge were one and the same.
22 They were --

23 **MR. SMITH:** Not during this particular time
24 period.

25 **MR. SCHOFIELD:** Not during this particular time

1 period, okay.

2 **MR. SMITH:** Right.

3 **MR. ROLFES:** During the '63 through '66 time
4 period. However, following 1966 they were one
5 and the same.

6 **MR. SCHOFIELD:** Oh, okay.

7 **MR. SMITH:** Right.

8 **MR. PRESLEY:** Yeah. Okay, let's leave this
9 open, and Mark, the only thing that I know to
10 do -- 'cause we can talk about this for the
11 next week -- is if we decide that we've got to
12 have our meeting on the night of the 7th, let
13 Mark give us an update on what's happened on
14 this.

15 **MS. MUNN:** That sure would be helpful to have.

16 **MR. ROLFES:** I guess -- I guess a little
17 clarification now as well, you know. If we
18 have indication that one individual did this
19 and it occurred, it becomes a dose
20 reconstruction specific to his claim. What
21 we've done for the site profile review is
22 evaluated, in our entire claimant population,
23 whether this in fact occurred. And for the
24 site profile issue we have a methodology to
25 address this and assign a dose based on the

1 relevant facts of the case and documentation in
2 our site profile, which we did agree within --
3 excuse me, that the Board did agree -- the
4 Board did agree with, I believe. We
5 incorporated -- remember we had discussed about
6 assigning a potential unmonitored dose. For
7 example, if an individual was working in a high
8 radiation area for three quarters and then
9 suddenly had a zero reported for the fourth
10 quarter, we did propose using a methodology
11 based on the individual's own dosimetry records
12 to interpolate a potential radiation dose, or
13 even assign the highest recorded dose from any
14 quarter of that year to the quarter where the
15 individual had a zero dose and indicated that
16 he had removed his dosimeter or hid his
17 dosimeter.

18 **MR. PRESLEY:** Uh-huh.

19 **MR. ROLFES:** So there is a dose reconstruction
20 methodology that exists, and that is the focus
21 of the site profile review.

22 This is also something that was considered for
23 the SEC evaluation as well, which is a separate
24 issue at this point, so...

25 **DR. ROESSLER:** I think that's a separate issue,

1 but since we've spent a lot of time on it today
2 and since we know that this is going to be an
3 area that comes up and up again, I like Bob's
4 idea of a workgroup on this particular issue,
5 and I don't -- I hope we don't lose that
6 thought. That should come up at the Board
7 meeting, I think, in --

8 **MR. ROLFES:** Okay.

9 **DR. ROESSLER:** -- Las Vegas.

10 **MR. ROLFES:** All right. All right.

11 **MR. SMITH:** Mark, this is Billy.

12 **MR. ROLFES:** Yes, Billy.

13 **MR. SMITH:** You may want to inform the Board of
14 the problems that I encountered relative to
15 trying to retrieve some of the --

16 **MR. ROLFES:** Yes.

17 **MR. SMITH:** -- (unintelligible) data.

18 **MR. ROLFES:** Yes.

19 **MR. SMITH:** I don't know how that's going to be
20 resolved between now and the January meeting,
21 so --

22 **MR. ROLFES:** Yeah, very true, Billy. NIOSH
23 isn't the only one with funding problems, and
24 DOE is also, you know, under a tight budget
25 constraint right now as well. To access

1 individuals' records it can get into quite a
2 large amount of time and money and man hours
3 that go into these studies. These -- these are
4 not simple record retrievals. These take lots
5 of time. And if we're talking about going
6 through a lot of data, it -- it's not something
7 that's going to be addressed in a very -- I
8 don't foresee it being, you know, done in a
9 very timely manner. We'd certainly make any
10 arrangements we could to try to -- you know, to
11 try to do it in a timely manner, but I -- I did
12 want to make the Advisory Board aware of that,
13 or the working group aware of that, so...

14 **MR. PRESLEY:** I'm very much --

15 **MS. MUNN:** (Unintelligible)

16 **MR. PRESLEY:** I'm very much aware of that.

17 **MS. MUNN:** We certainly do hope we're not
18 talking about a significant sorting of data.
19 If it's not -- if it's available, that's one
20 thing. If it's -- if it's not available, then
21 that's an entirely different issue.

22 **MR. SMITH:** Wanda, this is Billy. The data is
23 available. One of the main storage systems
24 that they use for these records -- well, Nevada
25 brought all of the records back from the

1 federal archives and put them in a repository
2 here --

3 **MS. MUNN:** Right, right, thank goodness.

4 **MR. SMITH:** -- and most of them are stored on -
5 - on microfilm, and you can go in by some
6 microfilm index number and -- and -- and find
7 most of the things that you are looking for.
8 Then the staff over there -- DOE staff over
9 there have to go over and sort through these
10 things and sort out the Privacy Act stuff
11 that's associated with it so when they present
12 it to us it doesn't have all the stuff other
13 then what we --

14 **MS. MUNN:** All the other identifiers, yeah.

15 **MR. SMITH:** Yes. So -- and their staff has
16 recently been reduced -- I -- I was trying to
17 get some information from Martha DeMarre within
18 the last few weeks and she just couldn't
19 support me because of their --

20 **MS. MUNN:** (Unintelligible)

21 **MR. SMITH:** -- ongoing mission and -- and she
22 does not have the resources, and I'm not
23 allowed to go into their particular database
24 because I don't have the permissions to get --
25 to use their databases.

1 **MS. MUNN:** Right.

2 **DR. ROESSLER:** I think that because this is
3 really a bigger issue and there's -- there are
4 a lot of problems like time and budget, it
5 needs to be done on a very systematic way, not
6 just somebody has an idea, we follow through on
7 it and then maybe that's not considered the
8 very best way to have approached it. Again, I
9 just want to support the idea of a working
10 group on this particular issue.

11 **MR. PRESLEY:** Let me ask something. Can we go
12 ahead and for this site profile go ahead and
13 say that we support, as a working group, the
14 means of doing this on this site profile, but
15 we recommend that the Board ask that a working
16 group be put together to study this as a
17 complex-wide problem?

18 **MR. SCHOFIELD:** Bob, I'll back that. I'll
19 second that.

20 **MS. MUNN:** Sounds reasonable to me.

21 **MR. CHEW:** Mark?

22 **MR. ROLFES:** Yes.

23 **MR. CHEW:** This is Mel. I think that -- I
24 think maybe it's best for us to -- the ORAU
25 team and you and NIOSH, to -- let's get

1 together and think about this and how to
2 approach -- to answer this particular one for
3 the site profile here before we make any
4 commitment you said (unintelligible) with an
5 approach that we can try to address this thing
6 in a timely manner.

7 **MR. PRESLEY:** Can -- can we talk about this
8 then on September (sic) the 7th and come up
9 with -- if we can -- if we can close this issue
10 out for this SEC, I'm sorry, for this site
11 profile, and then make the recommendation that
12 the Board study this for a -- have a study
13 group look at this for a -- as a -- not a site
14 --

15 **DR. ROESSLER:** Global.

16 **MR. PRESLEY:** -- global problem, 'cause that's
17 what we talked about before. I remember --
18 hey, Lew, you still on there? Lew may still
19 have the list of what we talked about but I'm
20 pretty sure this was one of the problem-- one
21 of the things that we -- we looked into and --
22 and we decided we didn't have the money to do
23 at the time, but I think it's going to have to
24 be done or else we're going to have this
25 problem on every site.

1 **DR. ROESSLER:** Bob, I think maybe you meant,
2 when you mentioned a date, in January 7th for
3 our --

4 **MR. PRESLEY:** January 7th, yeah.

5 **DR. ROESSLER:** Yeah, just for the record.

6 **MR. PRESLEY:** Yeah, January 7th. Can we -- can
7 we do that? Mark, can you just come back and -
8 - and y'all talk about it? SC&A, what do you
9 think about that, John?

10 **DR. MAURO:** Yeah, the way I'm looking at this
11 is that this is an idea to come at a very
12 important problem, its feasibility, its
13 plausibility, how you would actually do it,
14 whether it'll work and -- is still uncertain.
15 And I think the first step is just -- you know,
16 I -- I guess it was Mel that mentioned this --
17 I believe it was Mel -- you know, we've got to
18 first look at whether -- you know, whether it's
19 plausible to do this in this particular
20 instance, on this site, and maybe this could
21 almost be a pilot investigation. That is, you
22 know, for this site, since we do know -- sounds
23 like that we do -- do know that there is --
24 that these data do exist, the -- I mean the
25 pocket ionization chamber exist, but the

1 plausibility of retrieving it, the cost, what
2 it's really going to tell us, there may be some
3 fundamental flaws with the idea, we don't know.
4 But I think that -- so the first step should be
5 taken by -- by which -- just to look into the
6 plausibility of this line of investigation to
7 give us fruitful results in this particular
8 instance. And if we could hear back about the
9 plausibility of it on the 7th, that would be
10 very helpful.

11 **DR. MAKHIJANI:** Well -- well, I think Mr.
12 Presley is -- is -- is also right in the sense
13 that we -- we are looking at it in -- in this
14 context, but -- but as has been mentioned, it
15 comes up at many different sites and -- and --
16 and -- well, in a way it's not for us, but it -
17 - it -- this is, to some extent, a generic
18 issue. I mean there's a particularity with NTS
19 because there's more documentation here, but --
20 but there is -- there is a more general
21 question and maybe a more general method is
22 called for or a general investigation is called
23 for.

24 **MR. PRESLEY:** Let's let -- let NIOSH look at
25 this and come back to us with a recommendation

1 on the 7th. Mark, do you agree?

2 **MR. ROLFES:** All right. Okay.

3 **MR. PRESLEY:** Hey, Larry? Is he there?

4 **MR. ELLIOTT:** I'm here.

5 **MR. PRESLEY:** Is that workable for you?

6 **MR. ELLIOTT:** I'm sorry, I was distracted in
7 another conversation and so I wasn't paying
8 attention. Can you fill me in?

9 **MR. PRESLEY:** All right. We're going to -- we
10 are asking you all to come back with a
11 recommendation on the 7th, that night in our
12 meeting, on whether it would be plausible to
13 look into this issue of checking badges with --

14 **MR. ELLIOTT:** PICs.

15 **MR. PRESLEY:** -- yeah, PICs and -- and things
16 like that.

17 **MR. ELLIOTT:** Given our -- given DOL's
18 constraints included, I understand.

19 **MR. PRESLEY:** Right. Right. Okay?

20 **MR. ELLIOTT:** We'll certainly be prepared to
21 give you a status report.

22 **MR. PRESLEY:** I think that's -- I think that's
23 only fair. Okay? Working group, are y'all
24 satisfied with that?

25 **MS. MUNN:** Surely.

1 **MR. SCHOFIELD:** Yes.

2 **DR. ROESSLER:** Yes.

3 **MR. PRESLEY:** All righty, let's go on to 21.

4 **MR. CLAWSON:** Hey, Bob, this is Brad.

5 **MR. PRESLEY:** Yes.

6 **MR. CLAWSON:** I'm going to be back with you for
7 about 20 minutes. They'll come and get me when

8 --

9 **MR. PRESLEY:** Okay.

10 **MR. CLAWSON:** -- exactly I've got to run, so I

11 --

12 **COMMENT TWENTY-ONE: EXTREMITY DOSIMETRY**

13 **MR. PRESLEY:** All righty. The TBD does not
14 contain information about extremity dosimetry.
15 Mark, do you want to go over that? This is
16 another --

17 **MR. ROLFES:** Okay, sure. We do have extremity
18 dosimetry within individuals' DOE reported dose
19 files, and those are used in dose
20 reconstructions when necessary. For example,
21 if the individual has a skin cancer of an
22 extremity for which we need to calculate a dose
23 to that extremity. Let's see, I believe that
24 we have provided an update in the NTS Chapter
25 6, Revision 1, and let's see, that is Section

1 6.3.5.3.1 -- let me check on the status. That
2 is currently -- that should be in the
3 currently-approved documentation, so it is
4 currently available. And I believe that --
5 let's see, our response also addresses the
6 expanded review that was conducted by SC&A as
7 well.

8 **MR. PRESLEY:** Right. Okay. Arjun or John, do
9 y'all have a problem with this? As I see it,
10 this is a closed issue. We -- we solved this
11 problem in Cincinnati on the 25th.

12 **MS. MUNN:** I think we did.

13 **DR. MAKHIJANI:** Yeah, from -- from a TBD point
14 of view. That might have to come up in -- in
15 the SEC, but from a -- if -- if -- if -- yeah,
16 our -- our comment had been -- in -- in our
17 review that there were only rare instances of
18 monitoring, as NIOSH said, prior to '67. After
19 '67 it doesn't seem to be an issue.

20 **MR. PRESLEY:** Right.

21 **DR. MAKHIJANI:** But I guess if the position is
22 we don't need to reconstruct doses prior to '67
23 at the present time, I guess -- you know, that
24 -- that's -- then it's not a TBD issue but it
25 might be an SEC issue.

1 **MR. PRESLEY:** Right.

2 **DR. MAKHIJANI:** Right, agreed.

3 **MS. MUNN:** Good.

4 **COMMENT TWENTY-TWO: NEUTRON DOSES**

5 **MR. PRESLEY:** Let's go on to 22. There are no
6 neutron doses -- neutron dose data until 1966
7 and partial data until 1979. Mark, do you want
8 to -- we talked about this also. You want to
9 say what our finding was on this?

10 **MR. ROLFES:** Yes, let's see, we've got a
11 proposed methodology based on the Pantex site
12 profile, and these are based on recorded
13 dosimeter results for individuals that were
14 working in a production-related environment.
15 Nevada Test Site, once again, was limited to a
16 very defined number of tests involving a
17 defined exposure potential to neutrons. The
18 comments that we recently received also on --
19 these were public comments that had been sent
20 out to the Advisory Board. This concern was
21 raised by an individual member of the public as
22 well, and this was in regards to Operation BREN
23 and HENRE. We do have data indicating that
24 neutron doses were in fact monitored associated
25 with those projects, the bare reactor

1 experiment Nevada and the high energy reactions
2 experiment, which were conducted on-site at
3 Nevada Test Site. So I believe that we do have
4 information that would allow us to do a
5 claimant-favorable dose reconstruction.

6 **MR. PRESLEY:** That's al-- go ahead, I'm sorry.

7 **MR. ROLFES:** Oh, no.

8 **MR. PRESLEY:** That's also been reported out in
9 the NTS Revision 1.

10 **MR. ROLFES:** Yes. And that's -- that's the
11 portion -- the Page Change 1 portion I believe
12 is still in -- let's see, that's still
13 internal, I believe. Let me verify that --
14 yes, it's still internal, in review at this
15 time, so...

16 **MR. PRESLEY:** Okay. Anybody have anything on
17 that?

18 **DR. MAKHIJANI:** Yeah, we -- we've reviewed
19 this, Mr. Presley, in -- in our October review
20 that we submitted to the working group --

21 **MR. PRESLEY:** Uh-huh.

22 **DR. MAKHIJANI:** -- and had commented then that
23 the use of these NP ratios from Pantex was not
24 well justified and -- and -- in one case 2.5
25 and in the other case five, and in general have

1 some discomfort with -- with NP ratios from
2 other sites being transferred to -- you know,
3 intersite use of NP ratios seems -- seems to
4 pose some difficulties in terms of
5 (unintelligible).

6 **DR. MAURO:** I'd like to add, though, that the
7 first part of your response dealing with the
8 tests and the contribution of neutron exposure
9 as a function of distance, I'm familiar with
10 that and that's certainly true. That is -- so
11 the -- the problem has to do -- I mean if there
12 is an issue here, it has to do with the
13 neutron-to-photon ratio that's being adopted
14 for people who were exposed I guess in the
15 reactor tests.

16 **DR. MAKHIJANI:** Right, on the methodology in
17 regard to the tests, we -- we -- we didn't
18 reproduce the calculations, but saw no
19 problems.

20 **DR. MAURO:** Yeah, we -- yeah, that the -- yeah,
21 we agreed that the -- the neutron doses at --
22 at a distance are not going to be a problem.
23 But right now -- I think that was one of our
24 findings in the -- in the Pantex, even though -
25 - I know that's right now being held up for

1 various reasons, but that wa-- that was one of
2 our concerns, and not only the Pantex ratio but
3 also, as Arjun pointed out, the -- the use of
4 other site data in this context, and we're
5 actually working on -- with -- with the working
6 group whe-- on the -- under what conditions can
7 you use other site data. This is certainly an
8 area that has been actively investigated by
9 other working groups.

10 **MR. ROLFES:** Okay. One of the important things
11 to mention I guess, also the Operation BREN,
12 the Bare Reactor Experiment Nevada, one of the
13 primary concerns was potential neutron
14 exposures associated with an atmospheric test,
15 and we do have quite a number of civil effects
16 experiment documents that were conducted by --
17 this was under the civil effects test
18 operations, CETO, I believe, that was quite an
19 elaborate study and quite a bit of detail
20 associated with this test in order to determine
21 neutron doses and gamma doses at various
22 distances and reactor heights or source heights
23 on the BREN tower. The individuals that had a
24 potential for neutron exposure in these
25 scenarios were in fact monitored, and I think

1 that's the important point.

2 In relation to the device assembly individuals
3 -- so the bottom line is that atmospheric
4 testing, the people that were in a potential to
5 be -- well, there really was no potential
6 during the atmospheric testing time period for
7 the great majority of individuals. The one
8 exception we've mentioned is potentially a
9 flight crew from the military that could have
10 been in the air during a test.

11 The individuals at NRDS and those associated
12 with Operations BREN and HENRE were also
13 monitored. Furthermore, we do have
14 documentation at the NRDS of the gamma and
15 neutron dose rates surrounding the reactor at
16 various distances. Those could simply be used
17 to apply a neutron-to-photon ratio because it
18 is documented the highest recorded exposures
19 received on these reactor tests for each
20 reactor test. So there -- there are a number
21 of pieces of information that we could use to
22 assign neutron doses from various operations
23 and --

24 **DR. MAURO:** Mark, I'd be interested in how tho-
25 - those ratios stack up against the -- the 1.7

1 (unintelligible) value that you were thinking
2 about using originally. Other words, have you
3 sort of confirmed that the 1.7 was a good
4 number or does it show that the actual data you
5 have -- maybe the 1.7 was not very claimant
6 favorable?

7 **MR. ROLFES:** Well, let me -- let me pull up a -
8 -

9 **DR. MAURO:** Because this goes a little bit
10 toward this question of other site data, it's -
11 - it's almost like a test case.

12 **MR. ROLFES:** Let me see if I can find this
13 reference here.

14 **MR. SMITH:** Mark, while you're looking -- this
15 is Billy.

16 **MR. ROLFES:** Yes, Billy.

17 **MR. SMITH:** I actually worked on Project HENRE
18 at NRDS. That was a linear accelerator so
19 there was no gamma associated with that
20 particular operation. Only when the BREN tower
21 was in Area 4 -- it was a bare reactor, it was
22 a research reactor that -- that's now back at
23 Oak Ridge at DOSAR -- would there have been
24 some gamma associated with neutrons.

25 **MR. ROLFES:** Okay. I do have, for example --

1 this is from the Los Alamos Scientific
2 Laboratory, environmental effects of the QETNT*
3 effluent, a review and evaluation report. I am
4 looking through this document and there is a
5 table at various distances from the reactor
6 that have integral gamma and neutron data at
7 100 and 200 feet. At the closest measurement,
8 which was 100 feet from the reactor, the gamma
9 dose rate was -- let's see -- about three --
10 let's see, let me make sure I've got this right
11 -- this was an integral dose, so it was a total
12 of 3,640 rad for gamma exposures. The neutron
13 exposure was 65 rad, so --

14 **DR. MAURO:** Okay, so it was (unintelligible).

15 **MR. ROLFES:** -- we're talking about -- yeah,
16 we're talking about a couple of orders of
17 magnitude difference, so an individual that was
18 associated with the project that received gamma
19 dose likely would not have received a
20 significant neutron dose without receiving a
21 very large gamma dose, is -- is the bottom
22 line.

23 **DR. MAURO:** Uh-huh. That -- that sort of
24 validates that the 1.7 if you were to -- if we
25 did use that, at least in -- from the

1 comparison you made, it would be very claimant
2 favorable.

3 **MR. ROLFES:** Yes, very.

4 **DR. MAURO:** In fact to the point where -- yeah,
5 okay. All right, that's helpful.

6 **MR. PRESLEY:** All right, we're going to mark
7 this one closed.

8 **COMMENT TWENTY-FOUR: HIGH-FIRED OXIDES**

9 Okay, let's go on to 24, presence of high-fired
10 oxides resulting from atmospheric weapons
11 testing and reactor testing needs to be
12 investigated. Mark, y'all did a tremendous
13 amount of work on that.

14 **MR. ROLFES:** All right. Yes, I did just
15 receive notification of a revision to TIB-49
16 which addresses plutonium strongly retained in
17 the lung, and that basically gives us
18 adjustment factors to -- based on the data that
19 we have for a particular claim, on how to
20 assign a claimant-favorable dose estimate for
21 high-fired oxides or very insoluble plutonium.

22 **MS. MUNN:** This has been well covered by many
23 workgroups and I think --

24 **MR. ROLFES:** Yeah, and also --

25 **MS. MUNN:** -- most of them agree it's done.

1 **MR. ROLFES:** I apologize, I talked over you a
2 little bit, Wanda. And also obviously from the
3 atmospheric weapons testing period there is an
4 SEC that has been designated for the '51
5 through '62 time period, so...

6 **MR. PRESLEY:** Yes, I'm going to mark that one
7 complete.

8 **COMMENT TWENTY-FIVE: SITE EXPERT INTERVIEWS**

9 All righty, 25, NIOSH documentation of site
10 expert interviews is inadequate. Mark, you all
11 have gotten with SEC and -- or SC&A and done a
12 tremendous amount of work I know back on that.
13 Do you want to discuss your all's findings with
14 that?

15 **MR. ROLFES:** Well, in addition to those listed
16 in this document, there are additional
17 interviews once again that have been conducted
18 following the Special Exposure Cohort
19 submission that we received, so as far as for
20 the -- and those -- the summarization of those
21 interviews has been presented in -- in what
22 I've related to you today as well, so I don't
23 foresee us needing to do anything else with
24 this.

25 **MR. PRESLEY:** No. Arjun?

1 **DR. MAKHIJANI:** Yes, Mr. Presley, I agree with
2 that. Just as a kind of FYI, the -- the
3 broader interview procedure -- now NIOSH has a
4 very formal procedure for documenting
5 interviews now and -- and we've reviewed that
6 separately as part of our Task III work, and
7 Ms. Munn, you have that report.

8 **MS. MUNN:** Right.

9 **DR. MAKHIJANI:** We haven't discussed, I don't
10 think, at any of our meetings, but -- but you
11 have that report.

12 **MS. MUNN:** Right, I do.

13 **DR. MAURO:** I think that's OTIB-97 --

14 **DR. MAKHIJANI:** Yeah, so --

15 **DR. MAURO:** -- or Proc. (unintelligible) --

16 **DR. MAKHIJANI:** -- so Mr. Presley, I -- I agree
17 with Mark, it's --

18 **MR. PRESLEY:** Okay.

19 **DR. MAKHIJANI:** -- closed.

20 **MR. PRESLEY:** Yeah, we had a -- y'all sent me
21 an e-mail message on that.

22 **COMMENT ELEVEN: ENVIRONMENTAL DOSE**

23 Now we're through the 25, except we need to go
24 back to 11. Arjun had to leave. Arjun, what
25 we said we were going to do is wait till you

1 got back and then go back and discuss 11, so if
2 everybody (unintelligible) --

3 **DR. MAKHIJANI:** Yeah, (unintelligible).

4 **MR. PRESLEY:** -- everybody would, go back to
5 11, which has to do with correction factors for
6 extreme environmental doses and --

7 **DR. MAKHIJANI:** Where am I? I've lost my --
8 number 11, okay. Yeah, before I -- I'm very
9 sorry, again, I had to leave like that, but I --
10 -- we -- we did -- we had overlooked number 11
11 because it was about environmental dose, but it
12 actually had been a revision in -- in Chapter 6
13 and I had overlooked it, thinking that we were
14 not to review environmental doses. Since our
15 last working group I had asked our team to
16 prepare responses to this. Unfortunately,
17 we've got two different pieces of paper. They
18 aren't consolidated or internally reviewed.
19 I'm sorry they aren't ready yet, but I will --
20 I will send you this piece of paper immediately
21 after the first of the year, so about a week
22 before the Board meeting.

23 **MR. PRESLEY:** Okay, 'cause I -- you know, we're
24 going to have to have that meeting on the 7th.
25 I'd like --

1 **DR. MAKHIJANI:** Yes.

2 **MR. PRESLEY:** -- to be able to discuss this --

3 **DR. MAKHIJANI:** Yes.

4 **MR. PRESLEY:** -- as one of the action items and
5 saw that off at that time.

6 **DR. MAKHIJANI:** Yeah, you -- you will have this
7 several days before -- before the meeting on
8 the 7th.

9 **MR. PRESLEY:** Okay.

10 **DR. MAURO:** I've got just a quick question on
11 the response that's provided by Mark. I notice
12 that you did an analysis of angular or
13 directional dependence.

14 **MR. ROLFES:** Uh-huh.

15 **DR. MAURO:** And based on your analysis, you
16 felt that there was -- there is -- the
17 adjustment factor is one. That is, there
18 really --

19 **MR. ROLFES:** Exactly.

20 **DR. MAURO:** -- is no effect. Did you -- did
21 you do that based on -- you ran some models and
22 -- and how the -- did -- the flux would hit --
23 hit the -- other words, what am I -- am I to
24 understand what you're saying is a person was
25 standing in a contaminated area, let's say it

1 was a -- the ground was contaminated. You're
2 saying that the -- the angular direction
3 doesn't really change the -- the response of
4 the film badge?

5 **MR. ROLFES:** It does not change it where it
6 would exceed our claimant-favorable dose
7 conversion factors.

8 **DR. MAURO:** Oh, I see.

9 **MR. ROLFES:** And certainly in light of our --
10 our assumptions that we make when we complete a
11 dose reconstruction, we are already
12 incorporating various correction factors for
13 energy spectra and -- let's see, radiation
14 energies -- let's see, I'm trying to recall off
15 the top of my head other -- but the bottom line
16 of the study was that we did take a look at
17 whether separate external dose correction
18 factors from environmental contamination would
19 result in a -- in a higher dose to the
20 individual than what the badge would have
21 reported, and we did not find that to be the
22 case.

23 **DR. MAURO:** Did you -- did you do this by a --
24 like an MCMP type calculation?

25 **MR. ROLFES:** I'll actually ask Gene Rollins for

1 clarification. I know that this was done quite
2 a while ago and -- let's see, I believe we had
3 addressed this -- let's see, that was in Rev. 1
4 of the NTS external dosimetry TBD. Let's see -
5 - and -- do we have Gene on the line? I'd like
6 to see if he could explain a little bit more
7 detail. I believe it was Richard that had
8 conducted this analysis.

9 **MR. ROLLINS:** Yes, I'm -- I'm here, Mark.

10 **MR. ROLFES:** It's been a while and I'm trying
11 to recall exactly what was done. I know we did
12 document it and it has been --

13 **MR. ROLLINS:** Well, we -- we worked up the
14 geometry factors and -- if I'm remembering
15 correctly 'cause it was done some time ago --
16 it turned out that the -- they were less than
17 one.

18 **MR. ROLFES:** Yes.

19 **MR. ROLLINS:** And so we decided just to leave
20 them as one, to be claimant favorable.

21 **MR. ROLFES:** Yes.

22 **DR. MAURO:** And this would be the fa-- let me
23 just see if I have it right. So you get a
24 reading on your dosimeter -- let's say a film
25 badge -- that reads 100 MR was -- the -- was

1 darkening on your -- your film badge, but
2 you're saying that -- that would -- but that's
3 of course determined under a certain set of
4 calibration conditions if the -- you're saying
5 the way in which you convert the -- the -- the
6 optical density reading on the film badge to an
7 organ dose, the way it's done now, is more than
8 adequate to account for the fact that the --
9 the film badge may not respond -- under-respond
10 if the angle of incidence is -- let's say not
11 perpendicular but say a much more severe angle,
12 you're saying that -- that the -- 'cause I know
13 when we did some calculations we found that the
14 angle of incidence did have a -- and the energy
15 of the photon did have a very significant
16 effect on how the film badge would respond and
17 -- but you're saying that you -- taking that --
18 even taking that into consideration, your --
19 your adjustment factors are more than
20 sufficient to account for that?

21 **MR. ROLLINS:** That's correct. Badges would not
22 have under-responded.

23 **DR. MAURO:** Did we -- do we have -- did we see
24 that? Did we -- has that report been -- is
25 that contained in any of your documents that we

1 have available to us?

2 **MR. ROLFES:** Did we document that in the site
3 profile, Gene? I --

4 **MR. ROLLINS:** The actual -- the actual
5 calculational package? No.

6 **MR. ROLFES:** No, okay.

7 **DR. MAURO:** I -- the -- I only bring it up
8 because I recall in another -- for some other
9 purposes, we did -- we did some analysis like
10 this and we did see a substantial, you know,
11 under-response on the ang-- when the energy is
12 low and the angle of incidence is -- is off --
13 is not perpendicular, you could really -- and I
14 was just surprised that, you know, you're okay.

15 **MR. ROLLINS:** We could -- we could -- I guess -
16 - I'm going to leave that up to Mark, but I
17 presume we could make that package available.

18 **MR. ROLFES:** Yeah, that's -- I'm trying to
19 recall, I -- I wanted to look back and see if I
20 could find -- I don't have those -- I thought
21 we had closed this issue at the last --

22 **MR. PRESLEY:** Yeah, we had.

23 **MR. ROLFES:** -- working group meeting.

24 **DR. MAURO:** We did? Please, I apologize. If
25 this has been closed, I --

1 **MR. PRESLEY:** We closed this.

2 **DR. MAURO:** I don't want to open it up again, I
3 just wasn't --

4 **MR. PRESLEY:** You all -- you all met with this
5 -- with NIOSH and closed this thing about the -
6 - about the interviews. That's what I've got -
7 -

8 **DR. MAKHIJANI:** Yeah, yeah, we -- we -- the
9 documentation of the interviews?

10 **MR. PRESLEY:** Right.

11 **DR. MAKHIJANI:** Yeah, John -- John, we did.

12 **DR. MAURO:** No, I'm talking about this angle of
13 incidence response --

14 **DR. MAKHIJANI:** Oh, the angle of incidence
15 thing?

16 **DR. MAURO:** Yeah, I mean the -- I -- I -- we're
17 on number 11. Right? I assume we're on number
18 11.

19 **MR. PRESLEY:** Yeah, I'm sorry.

20 **DR. MAURO:** Yeah, number 11.

21 **DR. MAKHIJANI:** Number 11 is not -- Mr.
22 Presley, number 11 is not --

23 **MR. PRESLEY:** Right, right.

24 **DR. MAKHIJANI:** -- closed 'cause we haven't
25 given you our response to it.

1 **MR. PRESLEY:** Yeah, that's right.

2 **DR. MAKHIJANI:** But we will do that before --
3 before...

4 **DR. MAURO:** And the reas-- that -- that was --
5 for the question was do we have the analysis
6 that was done. Sounds like that there wasn't
7 qui-- there was an analysis done by NIOSH that
8 was a while back, and my question was did we
9 have an opportunity to look at it. And the
10 only reason I brought it up was I was surprised
11 to see, given a -- you know, a low energy
12 photon coming in at a high angle of incidence,
13 our -- my expectation is that you could really
14 underestimate a dose if you don't take that
15 into consideration.

16 **DR. MAKHIJANI:** Yeah, well, we're -- we're
17 going to file -- we're going to file our
18 response and -- and -- and you -- yeah.

19 **DR. MAURO:** Okay, but they have a report
20 apparently that -- that we haven't seen.

21 **DR. MAKHIJANI:** No, we have.

22 **DR. MAURO:** Oh, you -- we do have it. Okay,
23 that was my question.

24 **DR. MAKHIJANI:** This was -- yeah, this was --
25 this was a problem that -- it was a omission on

1 our part, John, which I just said is --

2 **DR. MAURO:** Okay.

3 **DR. MAKHIJANI:** It was there and -- and we
4 didn't -- we overlooked it and so in -- in our
5 general review of external dose issues and
6 that's why we had to go back and do this
7 separate piece of work.

8 **DR. MAURO:** Oh, okay. So we still owe them a -
9 - a -- our responses.

10 **DR. MAKHIJANI:** Right.

11 **DR. MAURO:** Okay.

12 **MS. MUNN:** Arjun, as a small heads-up, are you
13 seeing major problems here with the report that
14 you're putting out?

15 **DR. MAKHIJANI:** I don't know actually, Ms.
16 Munn. I -- I -- I farmed this out --

17 **MS. MUNN:** Or it's too early to ask. Okay.

18 **DR. MAKHIJANI:** -- I farmed this out and I
19 haven't -- I haven't had a chance to go through
20 it carefully.

21 **MS. MUNN:** Oh, fine, fine.

22 **DR. MAKHIJANI:** I wish I could brief you.

23 **MS. MUNN:** It was just -- my only thought was
24 time constraints with the meeting we're going
25 to have (unintelligible) before --

1 **DR. MAKHIJANI:** I will try to send it to you as
2 soon as possible.

3 **MS. MUNN:** No problem. Thank you.

4 **MR. ROLFES:** And also keep in mind that if you
5 are an individual that is working in a
6 contaminated environment, and if it's an
7 environmental area where there's a low dose
8 rate based on background contamination, it's
9 very unlikely that an individual's dosimeter
10 would even register a positive dose given the
11 low dose rate associated with an environmental
12 contamination scenario. I don't see
13 significant environmental doses being
14 accumulated by an individual at the Nevada Test
15 Site.

16 **DR. MAURO:** The only -- the only comment I have
17 is that it sound like, notwithstanding whether
18 there is one or not -- a detectable dose -- the
19 -- the argument is being made here that -- that
20 the angular -- direction really does not need
21 to be taken into account because built into the
22 calculational method and converting from a film
23 badge reading to an organ dose that you have
24 sufficient conservatism built into that
25 adjustment factor to account for any angular

1 dependency.

2 **MR. ROLFES:** Exactly.

3 **DR. MAURO:** And -- and -- yeah, and I believe
4 that's true, but we haven't reviewed that.

5 **MR. ROLFES:** Okay, so --

6 **DR. MAKHIJANI:** Why don't we just revisit that
7 (unintelligible).

8 **MR. ROLFES:** Okay, so as you are aware, if we
9 have a non-positive dose from an individual
10 working in an environmentally contaminated
11 area, we would assign a missed dose to that
12 non-positive dosimetry cycle, so --

13 **DR. MAURO:** Okay.

14 **WRAP-UP AND FUTURE PLANS**

15 **MR. PRESLEY:** Okay. Now, we're through our 25
16 items. We have the comments that Mark has
17 added from the external dose section of the NTS
18 technical database. Mark, to my knowledge, all
19 of these have been closed.

20 **MR. ROLFES:** All right.

21 **MR. PRESLEY:** Now, you know, we've got to go
22 back and look at that thing, and I was
23 wondering, has anybody -- has everybody had
24 time to look at this or has anybody got any
25 comments on these responses?

1 **MS. MUNN:** I don't have any grief with them
2 myself. I was wondering what -- what else do
3 we need to look at? Do we have any -- any
4 issue from SC&A on these?

5 **DR. MAKHIJANI:** (Unintelligible) didn't go over
6 these (unintelligible).

7 **MS. MUNN:** I -- I thought we were finished with
8 them.

9 **MR. PRESLEY:** Yeah, I did, too.

10 **MS. MUNN:** (Unintelligible) comments on the
11 external dose section. So we -- we've worked
12 the external dose thing pretty well and I
13 thought we'd come to closure with...

14 **DR. MAURO:** It looks like we've talked about --
15 I mean beta dose, there is this list of
16 radionuclides that -- aren't these similar to
17 the ones we just discussed --

18 **MR. PRESLEY:** They are a -- they're -- every
19 one of them are out of the same thing we just
20 discussed.

21 **DR. MAURO:** Yeah, that's what I -- that's what
22 I -- I'm looking at them and that's what
23 appears to be the case.

24 **MR. PRESLEY:** Yeah, these were --

25 **DR. MAURO:** Are there any here that we -- that

1 are new? When I say new, I -- are not already
2 covered by the above 25?

3 **MS. MUNN:** I don't think so. The comments are
4 all -- you know, responses that were made to
5 the -- to the first revision.

6 **MR. CLAWSON:** Hey, Bob --

7 **MR. PRESLEY:** Yes.

8 **MR. CLAWSON:** -- this is Brad. I'm going to --
9 they've come to get me now so -- are we -- one
10 question I wanted to find out before we left,
11 are we going to need to meet the 7th?

12 **MR. PRESLEY:** Yes.

13 **MR. CLAWSON:** Okay, so --

14 **DR. ROESSLER:** Do you have a time?

15 **MR. PRESLEY:** 7:00 o'clock.

16 **DR. ROESSLER:** Oh, good, okay.

17 **MR. SCHOFIELD:** What time?

18 **DR. BRANCHE:** All right, Bob -- Bob, this is
19 Christine.

20 **MR. PRESLEY:** Yes.

21 **DR. BRANCHE:** So you're going to definitely do
22 that? You're definitely going to see the need
23 for the meeting at 7:00 p.m. on that --

24 **MR. PRESLEY:** Yeah, we're going to --

25 **DR. BRANCHE:** -- Monday the 7th?

1 **MR. PRESLEY:** Yeah, we're going to have to to
2 go -- 'cause we've got some stuff to go over so
3 that hopefully we can make a recommendation to
4 the Board.

5 **DR. BRANCHE:** Okay, I just -- I want to make
6 sure 'cause I got to make arrangements for
7 Zaida to have the room arranged. We -- we sent
8 it up as tentative. Now I can confirm it with
9 her.

10 **MR. PRESLEY:** Yeah, yeah.

11 **DR. BRANCHE:** Okay.

12 **DR. ROESSLER:** But that's in the hotel, our
13 meeting hotel.

14 **DR. BRANCHE:** It will be in the hotel, yes.

15 **MR. PRESLEY:** And --

16 **DR. BRANCHE:** And we'll get details to you,
17 Bob, and the -- and the rest of the committee.

18 **MR. PRESLEY:** Okay, sounds good.

19 **MR. CLAWSON:** I just want to make sure I'll get
20 my schedule figured out for that. I know that
21 that was tentatively -- we went from there, so
22 we'll see you on the 7th then.

23 **MR. PRESLEY:** Okay, thank you, Brad.

24 **MR. CLAWSON:** Okay, thank you. 'Bye.

25 **MR. PRESLEY:** Okay.

1 **MS. MUNN:** We should be able to use the same
2 room as procedures.

3 **MR. PRESLEY:** Right, that's exactly right. I
4 don't see a problem. Y'all get through, we'll
5 go in.

6 **MS. MUNN:** Yeah.

7 **MR. PRESLEY:** In fact, two of us will already
8 be in there.

9 **MS. MUNN:** Yep, true.

10 **MR. PRESLEY:** Anybody got anything else on
11 these comments?

12 **MR. ROLFES:** Yes, is there anything that we
13 need to do with the public comments that we
14 received? We did put together a matrix from
15 the approximately 40 pages of information that
16 were received and we prepared a response and
17 how we've documented our public comments and
18 what we propose to do with the information
19 we've received. If there are any issues there,
20 I'd be happy to discuss those as well, so --

21 **MS. MUNN:** That was a staggering amount of
22 information and, as I said, I didn't do my
23 homework. I (unintelligible) not --

24 **MR. ROLFES:** Okay.

25 **MS. MUNN:** I didn't download that because it

1 wasn't from Mark and so I didn't -- I didn't
2 think that it was going to be (unintelligible).

3 **MR. PRESLEY:** Well, I'll tell you what I've
4 done. I've -- for two nights I've read over
5 those things, spent about four hours a night.
6 Some of them I've gone over more than once. I
7 don't see -- I'm going to be honest with you.
8 I don't see a whole lot of the comments that I
9 think we need to do a whole lot with. There's
10 some of the comments that -- that are going to
11 be incorporated in the site profile, but
12 there's a lot of those things that it would
13 take years and years and years and years and
14 years to go back and check on.

15 **MR. ROLFES:** Okay. I believe that we've done a
16 pretty good job at incorporating the issues
17 that would affect the outcome of a dose
18 reconstruction, so --

19 **MR. PRESLEY:** I think you have, too.

20 **MR. ROLFES:** Okay.

21 **MR. PRESLEY:** I don't see a problem.

22 **MR. ROLFES:** Okay.

23 **MR. PRESLEY:** What I'm saying. Anybody else
24 got anything?

25 **MS. MUNN:** Can we hopefully make a short item

1 of that on our meeting on Jan-- in January?

2 **MR. PRESLEY:** I don't see why we can't. Mark,
3 do we need to --

4 **MS. MUNN:** I really would like to at least read
5 it over.

6 **MR. PRESLEY:** Yeah, yeah, I tell you what let's
7 do. Everybody go back, look at those things.
8 If you have an issue with anything, bring it to
9 the Board on the 7th and we'll discuss it.

10 **MS. MUNN:** Very good.

11 **DR. MAKHIJANI:** Mr. Presley, is that for the
12 working group or for --

13 **MR. PRESLEY:** That's for --

14 **DR. MAKHIJANI:** -- (unintelligible)?

15 **MR. PRESLEY:** That's for the working group --

16 **DR. MAKHIJANI:** Okay.

17 **MR. PRESLEY:** -- and we'll -- we'll go at it
18 from there, not SC&A. I'm not asking y'all --

19 **DR. MAKHIJANI:** Okay.

20 **MR. PRESLEY:** -- to do anything extra right
21 now.

22 **DR. MAKHIJANI:** Okay, right. Just clarifying.

23 **MR. PRESLEY:** Yeah.

24 **MS. MUNN:** Yeah, thank you, Bob.

25 **MR. PRESLEY:** Okay?

1 **MS. MUNN:** I feel badly about that. Sorry.

2 **MR. PRESLEY:** No problem. No problem. It took
3 -- I didn't start reading them until, like I
4 said, night before last.

5 **MS. MUNN:** I just didn't realize what they
6 were.

7 **MR. PRESLEY:** And --

8 **MS. MUNN:** My bad.

9 **MR. PRESLEY:** So I appreciate everybody's time
10 and concern and -- has anybody got anything for
11 the good of the working group or anything like
12 that? If not, I'd like to wish everybody a
13 Merry Christmas.

14 **MR. SMITH:** Bob, this is Billy Smith.

15 **MR. PRESLEY:** Yeah.

16 **MR. SMITH:** I sent Mark Rolfes a comment just a
17 minute ago, e-mail, I don't know whether or not
18 he saw it, but it has to do with a comment on
19 item 24. I think NRDL needs to be changed to
20 NRDS (unintelligible).

21 **MR. PRESLEY:** Okay.

22 **MR. ROLFES:** Thank you, Billy, I did see that
23 and -- let's see, let me get back -- I didn't
24 look in the matrix to see where -- where we had
25 put that.

1 **MR. SMITH:** Down at the bottom of number 24.
2 The fact that we were talking about the NRDL
3 document might be confusing if we leave it
4 uncorrected.

5 **MR. ROLFES:** Okay. Oh, okay, I see it here,
6 any new guidance would apply to the NRDL -- is
7 what it says -- activities. It should be NRDS.

8 **MR. SMITH:** Yes.

9 **MR. ROLFES:** My apologies. Thank you, Billy.

10 **MS. MUNN:** Thank you, glad you caught it.

11 **MR. PRESLEY:** Okay, has anybody else got
12 anything?

13 **MS. MUNN:** No, Merry Christmas to everyone.

14 **MR. ROLFES:** Yeah, Merry Christmas, Happy
15 Holidays.

16 **MR. PRESLEY:** Christine, do you have anything?

17 **DR. BRANCHE:** No, I just -- I just know that
18 we're going to be making plans for -- making
19 arrangements for the location on the 7th at
20 7:00 p.m. Is that right?

21 **MR. PRESLEY:** Yeah, and like --

22 **DR. BRANCHE:** Okay.

23 **MR. PRESLEY:** Like Wanda and I said, we can use
24 the same room. When she finishes up, then I'll
25 go -- come in.

1 **DR. BRANCHE:** Well, let's just make sure that
2 that's going to be okay with the hotel, so --

3 **MR. PRESLEY:** Okay.

4 **DR. BRANCHE:** -- (unintelligible) just wait for
5 notification from Zaida, I'd appreciate it.

6 **MR. PRESLEY:** Yeah, we can do that.

7 **DR. BRANCHE:** Okay. Merry Christmas to all of
8 you.

9 **MR. PRESLEY:** Merry Christmas to everybody.

10 **MR. SCHOFIELD:** Merry Christmas.

11 **MR. PRESLEY:** And I'd like to thank Mark Ross
12 (sic) for all his help.

13 **MR. ROLFES:** Thank you, Bob. Thank you,
14 everyone.

15 **MR. PRESLEY:** Merry Christmas.

16 **MR. ROLFES:** Happy New Year's and Happy
17 Holidays.

18 **DR. BRANCHE:** Merry Christmas, Ray Green.

19 **MR. PRESLEY:** Yeah, Ray.

20 **THE COURT REPORTER:** Thank you all.

21 (Whereupon, the meeting was adjourned at 4:12
22 p.m.)

1

CERTIFICATE OF COURT REPORTER**STATE OF GEORGIA****COUNTY OF FULTON**

I, Steven Ray Green, Certified Merit Court Reporter, do hereby certify that I reported the above and foregoing on the day of December 19, 2007; and it is a true and accurate transcript of the testimony captioned herein.

I further certify that I am neither kin nor counsel to any of the parties herein, nor have any interest in the cause named herein.

WITNESS my hand and official seal this the 25th day of January, 2008.

STEVEN RAY GREEN, CCR, CVR-CM
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