

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

convenes the

WORKING GROUP MEETING

**ADVISORY BOARD ON
RADIATION AND WORKER HEALTH**

NEVADA TEST SITE

The verbatim transcript of the Working
Group Meeting of the Advisory Board on Radiation and
Worker Health held in Cincinnati, Ohio, on Oct.
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*STEVEN RAY GREEN AND ASSOCIATES
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TRANSCRIPT LEGEND

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-- "*" denotes a spelling based on phonetics, without reference available.

-- "^"/ (inaudible)/ (unintelligible) signifies speaker failure, usually failure to use a microphone.

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P R O C E E D I N G S

(9:00 a.m.)

WELCOME AND OPENING COMMENTS

DR. WADE: We're going to begin.

This is Lew Wade and as always I have the privilege of serving as the Designated Federal Official for the Advisory Board. And this is a meeting of a work group of the Advisory Board, particularly this is the work group looking at the Nevada Test Site site profile. That work group is chaired by Robert Presley, members Clawson, Munn, Roessler and Schofield, and I believe they're all in the room.

Let me begin by asking if there are any other Board members who are on the call by telephone.

(no response)

DR. WADE: Are there any other Board members on the call by telephone?

(no response)

DR. WADE: Good, the reason I asked that is that we really can't have a quorum of the Board, and we don't. We have five Board

1 members present; a quorum would be seven.

2 So what I would suggest we do is go
3 around the table and make our introductions,
4 and those directly involved in the process
5 please identify if you come to the table with
6 a conflict. And then we'll go out into
7 telephone land and hear from those involved on
8 the telephone, a little bit of phone etiquette
9 discussion, and then we'll begin our
10 deliberations.

11 This is Lew Wade. I work for NIOSH
12 and support the Advisory Board.

13 **MR. CLAWSON:** Brad Clawson, Advisory Board
14 member, no conflict.

15 **DR. ROESSLER:** Gen Roessler, Advisory Board
16 member, no conflict.

17 **MS. MUNN:** Wanda Munn, Advisory Board
18 member, no conflict.

19 **DR. MAKHIJANI:** Arjun Makhijani, SC&A, no
20 conflict.

21 **MR. SCHOFIELD:** Phillip Schofield, Board
22 member, no conflict.

23 **MR. RICH:** Bryce Rich, ORAU support,
24 conflicted.

25 **MR. CHEW:** Mel Chew, ORAU team, not

1 conflicted.

2 **MR. ROLFES:** Mark Rolfes, NIOSH Health
3 Physicist, no conflict.

4 **MR. PRESLEY:** Robert Presley, Board member,
5 no conflict.

6 **DR. NETON:** Jim Neton, NIOSH, no conflict.

7 **DR. WADE:** Okay, let's go out onto the
8 telephone. Other members of the NIOSH or ORAU
9 team, please identify yourself.

10 **MR. ROLLINS (by Telephone):** This is Gene
11 Rollins. I am O-R-A-U team, not conflicted,
12 and I'm the document owner.

13 **DR. WADE:** Thank you, Gene, welcome, we're
14 glad you're with us.

15 Other members?

16 **MR. SMITH (by Telephone):** This is Billy
17 Smith, Chew team, conflicted.

18 **DR. WADE:** Other NIOSH/ORAU team members?
19 (no response)

20 **DR. WADE:** How about SC&A team members?

21 **DR. MAURO (by Telephone):** Yes, this is John
22 Mauro, SC&A, no conflict.

23 **DR. WADE:** Other SC&A team members?

24 **MR. ZLOTNICKI (by Telephone):** Joe
25 Zlotnicki, SC&A, no conflicts.

1 **MR. PRESLEY:** Can we have the name again,
2 please?

3 **MR. ZLOTNICKI (by Telephone):** Joe
4 Zlotnicki, that's Z-L-O-T-N-I-C-K-I.

5 **DR. MAKHIJANI:** He's one of our external
6 dose experts.

7 **DR. WADE:** Welcome.

8 Other members of the SC&A team?

9 (no response)

10 **DR. WADE:** How about workers, petitioners,
11 or any of those fine people with us this
12 morning?

13 (no response)

14 **DR. WADE:** Other federal employees who are
15 on the call by virtue of their federal
16 employment?

17 **MR. RAFKY (by Telephone):** This is Michael
18 Rafky with HHS.

19 **DR. WADE:** Welcome, Michael.

20 Is there anyone else on the call who
21 would like to be identified?

22 (no response)

23 **DR. WADE:** We have one new presence at the
24 table.

25 **MS. HOWELL:** Emily Howell, HHS.

1 **DR. WADE:** And then very briefly because
2 we've been doing very well on the telephone,
3 but again, if you're speaking, speak into a
4 handset as opposed to a speaker phone. Mute
5 whatever you can in your area if you're not
6 speaking, and be mindful of background noises.
7 Though I must say the last three or four calls
8 have been without flaw really, so thanks to
9 all of you for that.

10 Robert?

11 **INTRODUCTION BY CHAIR**

12 **MR. PRESLEY:** What I would like to do today
13 if that's acceptable to other working group
14 members is we will work off of the matrix that
15 Mark sent out on 10/17/07. It is a complete
16 new matrix. Then when we get to an issue that
17 involves SC&A and NIOSH's response, we will
18 pick the second one up that Mark sent out, and
19 it has the SC&A comment, and it also has the
20 NIOSH remark on it, and we will use that. And
21 then once we finish that response up, we will
22 go back to the original database and go
23 through it.

24 What that will do, I hope, is keep us
25 from going through some of this stuff that

1 we've already done once. Is that acceptable
2 to everybody?

3 (no response)

4 **MR. PRESLEY:** We've got some backup data
5 that I have here. It's also on your machine,
6 if you can get online, and we will use it in
7 our discussions for backup on some of these
8 responses today.

9 **DR. MAKHIJANI:** I didn't understand that.

10 **MR. PRESLEY:** The documents that were sent
11 out this past week or so on the interview with
12 Bruce Church and some of the other stuff is
13 what I'm talking about.

14 Okay, everybody ready to start?

15 Anybody have any questions?

16 (no response)

17 **COMMENT 1: SOME RADIONUCLIDE LISTS ARE NOT COMPLETE**

18 **MR. PRESLEY:** I'd like to start with Comment
19 1, an old comment that says, "Some
20 radionuclide lists are not complete." We have
21 worked this over. Things have been added,
22 deleted, Table 2-8 has been removed from the
23 TBD, and Table 2-3 and 5D-13 are not
24 appropriate at this time. We've discussed
25 this in our past meeting. We decided that the

1 review was complete for this, and that the
2 working group would review when the total TBD
3 comes out. Is that correct?

4 **DR. MAKHIJANI:** I believe that that's right.
5 And you've published one of the TBDs, right?

6 **MR. ROLFES:** That's correct. The external
7 dose TBD came out shortly before the last
8 meeting.

9 **DR. MAKHIJANI:** Right.

10 **MR. ROLFES:** And you had reviewed that.
11 Also, the site description has been released
12 as recent, and I did send that around to the
13 working group members and SC&A. But
14 additionally, the internal dose TBD is
15 currently in review at OCAS so we should have
16 that finalized relatively soon.

17 **DR. MAKHIJANI:** And as I told you just
18 before the meeting, I opened the site
19 description revision but have done nothing
20 with it. I have no instructions to do so.

21 **COMMENT 2: REACTOR TEST RE-ENTRY PERSONNEL**

22 **COMMENT 3: HOT PARTICLE DOSES**

23 **MR. PRESLEY:** Comment 2 is the Technical
24 Basis Document does not provide adequate
25 guidance for dose estimates to the gonads,

1 skin, gastrointestinal tract for early reactor
2 test re-entry personnel. Large hot-particle
3 doses to the skin and the GI tract have not
4 been evaluated. Naval Radiological Defense
5 Laboratories (NRDL) documents and models have
6 not been evaluated though one document is
7 referenced.

8 There are Findings 2; there's an
9 issues list. We have discussed this in the
10 past. SC&A has a response regarding the NRDS.
11 Arjun, do you want to go over you all's
12 response first?

13 **DR. MAKHIJANI:** Basically, we agreed with
14 part of NIOSH's response. I think we have a
15 common understanding that there were hot
16 particles there, but we did not see in the
17 revised external dose site profile was any
18 evidence for the assertion whenever there were
19 hot particles that measurements were actually
20 made.

21 So that was the main issue that was
22 outstanding, both consolidated Comments 2 and
23 3 in our response, because they're the same
24 response, Test Site as well as Reactor
25 Development Station. And so we cited again

1 the report of the NRDL, the Naval Reactor
2 Development Laboratory, that there were hot
3 particles especially in that one test.

4 Unfortunately, Lynn Anspaugh is not on
5 the call. He might have not noticed that
6 there is a call, and I didn't send him an e-
7 mail about it. But he also kind of felt that
8 the response was insufficient. And we had a
9 whole team perform this review, and they are
10 named in the review. I see there's been an
11 interview done. So that was the basic
12 substance of the response that there was no
13 evidence that measurements were actually made,
14 that there was some systematic procedure in
15 place throughout the period when there was
16 vulnerability of hot particles.

17 **MR. ROLFES:** In order to address --

18 Were you finished, Arjun?

19 **DR. MAKHIJANI:** Yes.

20 **MR. ROLFES:** In order to address the hot-
21 particle exposure issue, we went back and did
22 another records review, found several
23 documents related to the Nuclear Reactor
24 Development Test Station which had
25 characterizations of hot particles that were

1 released. We spoke with a person who worked
2 intimately in hot particle research and have
3 provided the Advisory Board with a draft copy
4 of his interview notes for your review.

5 Furthermore, we have information for
6 each of the reactor tests which includes beta-
7 gamma dose rate surveys of some of the
8 particles plus the dose rate information for
9 these particles, information regarding gamma
10 doses recorded on personnel dosimeters and
11 discussion of neutron exposures as well.
12 There's also very detailed gamma dose rate
13 surveys and neutron dose rate surveys. So
14 there's a lot of new information that I've
15 recently taken a look at.

16 Specific to the hot particles I'll go
17 ahead and read our response for this comment
18 on hot particles. The information regarding
19 the NRDS was not in the Rev. 1 of the TBD that
20 SC&A was able to review. Rev. 1 was already
21 under review at OCAS when Billy Smith provided
22 a white paper on the NRDS report.

23 When the Rev. 1 of the TBD was
24 official, a page change revision of NRDS
25 information was initiated, and it was combined

1 with the page change regarding the film
2 dosimeter correction factor of 1.25 for the
3 years 1960 to '65. October 19th, 2007, the
4 combined page change was returned to ORAU by
5 OCAS with comments that are in the process of
6 being resolved.

7 The following is the statement in the
8 publication record regarding the modified page
9 change. This page change revision
10 incorporates expanded coworker data on pages
11 42, 43, 45, 46 and 47 in Section 6.4. Text
12 was added to Section 6.5.1, page 58; Section
13 6.5.2, page 59 in order to address the hot-
14 particle issues. The use of the document,
15 hazards to personnel re-entering the Nevada
16 Test Site following nuclear reactor tests. An
17 additional reference to the text was also
18 added on page 42 as well as to the reference
19 section on page 71.

20 Furthermore, the records of the
21 individual's interview that we discussed,
22 provided to the Advisory Board, he was a
23 former NTS NRDS health physicist for DOE. And
24 his expert account clearly demonstrates that
25 the radiological monitoring, including these

1 contamination surveys, whole body counting, et
2 cetera, frisking after working in a hot area,
3 these methods were in place that would have
4 easily detected hot particles. These were not
5 casual areas, and stringent access control was
6 in place at this time as well in order to
7 minimize the exposures to personnel.

8 **DR. MAKHIJANI:** Mark, this was a little bit
9 later in the period, right? This person, for
10 instance, started sort of later on in the '60s
11 from what I read in the interview.

12 **MR. ROLFES:** He started there in early 1960,
13 '61 time periods.

14 **DR. MAKHIJANI:** Oh, that's not how I read
15 the interview.

16 **MR. PRESLEY:** (Reading) From July '61 to
17 June '62, I was employed with the U.S. Public
18 Service, attended school in Utah where I did
19 research measuring fall-out particles in milk
20 and atmospheric testing.

21 **DR. MAKHIJANI:** Yeah, that's not hot
22 particles on site. As I read this, the
23 employment history to be onsite associated
24 with NRDS in the latter part of the '60s.
25 Whereas Comments 2 and 3 go back to 1951.

1 **MR. ROLFES:** Okay, that's correct.

2 **DR. ROESSLER:** So he was not onsite until
3 '66. Is that --

4 **MR. ROLFES:** Correct; however, he was, in
5 fact, researching hot particles prior to that
6 time, and these hot particles were associated
7 with the nuclear reactor test itself.

8 **DR. ROESSLER:** So his research involved the
9 Nevada Test Site?

10 **MR. ROLFES:** That's right, yes.

11 **DR. ROESSLER:** So when he talks, in his
12 interview the thing that I felt was missing
13 were dates that we could tie things to, and so
14 what I'm assuming you're saying then is that
15 he was involved there from, with these issues,
16 from '61 to '69. Is that --

17 **MR. ROLFES:** I'll have to take a look at the
18 interview here.

19 **DR. ROESSLER:** It's in the first question --

20 **DR. MAKHIJANI:** Yes, right, the fall-out
21 particles in milk from atmospheric testing is
22 a completely different issue.

23 **MR. ROLFES:** Employed by the U.S. Public
24 Health Service at Nevada Test Site from July
25 of '61 to June '62, participated in research

1 projects measuring fall-out particles in milk
2 from atmospheric testing. Earned a BS degree
3 in molecular biology, radiobiology, a health
4 physics degree at Colorado State --

5 **MS. HOWELL:** I'm sorry. Can I interrupt?
6 Can we just be careful? I don't have this in
7 front of me, but this is a site expert,
8 correct?

9 **MR. ROLFES:** Correct.

10 **MS. HOWELL:** So we need to be careful about
11 sharing too much information so if you could
12 avoid reading the entire thing into the record
13 it would be helpful.

14 **MR. ROLFES:** We did receive verbal
15 permission from the individual to use his
16 information, but --

17 **MS. HOWELL:** Right, but we still can't...

18 **DR. ROESSLER:** Later on in his interview on
19 page six where Bryce Rich asked him a
20 question, Bruce Church said when we started
21 underground testing, 1961 to '62, he's
22 speaking there as though he was onsite.

23 **MR. ROLFES:** Yeah, the United States Public
24 Health Service was, in fact, responsible for
25 monitoring of tests offsite. They did some

1 onsite I believe.

2 Is that correct, Mel? You did --

3 **MR. CHEW:** Yeah.

4 **MR. ROLFES:** Okay, so personnel from the
5 United States Public Health Service were, in
6 fact, onsite, but they were more responsible
7 for tracking effluents off the Nevada Test
8 Site.

9 **MR. RICH:** They were an integral part of the
10 controls for the radiological --

11 **MR. PRESLEY:** That's exactly right. Each
12 time that we had any type of a test, they were
13 very much involved with the pre-testing and
14 also the after the test.

15 **MR. CLAWSON:** This is Brad. Was this more
16 for the downwinder or was this for basically
17 on the site? Because, you know, at that same
18 timeframe, this is when the whole downwind
19 issue started coming about. And Bryce,
20 correct me if I'm wrong, but I think a lot of
21 this was pertaining to what was blowing off of
22 the site.

23 **MR. ROLFES:** Exactly.

24 **MR. RICH:** It did both. They had the, they
25 did onsite monitoring at the peripheries of

1 the site, but they were also focused on the
2 off-site issues. But as part of the
3 integrated control system that USPH and
4 General Electric, the whole group was an
5 integrated support.

6 **MS. MUNN:** But obviously a great deal of
7 attention was paid to weather conditions at
8 the time of each event in an attempt to
9 minimize any exposure both onsite and offsite.
10 It's very clear that they were going out of
11 their way to try to make sure that weather
12 conditions were not detrimental to either the
13 employees or the general public.

14 **MR. ROLFES:** Correct.

15 **DR. MAKHIJANI:** My only point in this regard
16 is it appears to me that until the late '60s,
17 this person was primarily involved in offsite
18 activities, and the way I read the NRDL
19 documents from 1968 it seemed to me that they
20 were directly involved in evaluating their own
21 radiological information. And they had the
22 personnel to do it. They produced all those
23 documents.

24 And I would imagine in regard to
25 reactor testing that there might be experts

1 who might have direct knowledge of that period
2 involved because since the SEC's only for
3 internal dose going back to 1951. I mean the
4 question stretches back all the way to 1951
5 and the reactor ^ what, in the late '50s? I
6 don't remember the date.

7 So this is certainly a partial answer
8 to that, to the comment in the white paper
9 that we sent you, or the review that we sent
10 you. This certainly responds partially to
11 that, but I think only partially.

12 **MR. ROLFES:** I did want to point out there
13 is a clarification. One of the latest, I got
14 a revised copy of his interview notes. He
15 hadn't had the opportunity to fully go through
16 some of the things because he did give a quick
17 overview of his notes. I do have some notes
18 that are slightly different. I just want to
19 clarify that he was, in fact, at the Nevada
20 Test Site as a member of the U.S. Public
21 Health Service in 1961.

22 **DR. ROESSLER:** I think it adds a lot of
23 credibility to his interview if we have those
24 dates because it's not really clear on what we
25 got. Can we assume then that he was there and

1 involved in what he's discussing covers the
2 period from '61 through '69 when he left?

3 **MR. ROLFES:** I would certainly believe so.
4 I don't know if he was there 100 percent of
5 the time at the NRDS. We can certainly ask
6 for a clarification from him.

7 **DR. NETON:** I think we need to go back and
8 verify that.

9 **MR. PRESLEY:** It plainly states right here
10 that he was here 1961-1962. He was employed
11 by the U.S. Public Health Service at the
12 Nevada Test Site.

13 **MR. ROLFES:** Gene or Billy --

14 **DR. WADE:** Do you want me to make copies of
15 that? Or is that copyable?

16 **MR. ROLFES:** Yeah, I think we can make
17 copies of this.

18 **MR. RICH:** It doesn't have the red
19 highlights which indicate it has changes in
20 the original.

21 **DR. WADE:** So why don't we get that out to
22 people?

23 **MR. RICH:** The red doesn't show. The
24 comments are there. It just doesn't show.

25 **MR. ROLFES:** It does have underlying tracked

1 changes so if you'd like to make a copy of
2 this then, thanks.

3 **DR. MAKHIJANI:** Mark, could you just e-mail
4 it to me?

5 **MR. ROLFES:** Certainly.

6 Gene or Billy?

7 **MR. SMITH (by Telephone):** Hi, you guys.

8 **MR. ROLFES:** Do you recall if Bruce was
9 continuously there at the Nevada Test Site
10 during that time period? Could you go into a
11 little bit more detail about his job functions
12 as you recall, Billy or Gene, either of the
13 two?

14 **MR. SMITH (by Telephone):** Well -- this is
15 Billy. I'm not sure about the exact dates of
16 Bruce's campaigns, various campaigns at the
17 NRDS-slash-NTS, but he was with the Public
18 Health Service and that he set up the Health
19 Physics program that NRDS used. And then he
20 went off to school, and then he came back and
21 became the Radiological Programs Director for
22 the Nevada Operations Office.

23 But I'm not sure about the dates. We
24 could ask Bruce to confirm those. I think you
25 found the only changes that he had to his

1 original interview notes. But I'm not sure
2 about the exact dates because that was prior
3 to my start in 1966.

4 **MR. ROLLINS (by Telephone):** Mark, this is
5 Gene Rollins. I'm looking right now at his
6 revised, the ones that Bruce has made comments
7 on. He made a couple of changes in here. And
8 it appears that he says that he worked for the
9 Public Health Service from '61 to '62. Then
10 he went back and got his bachelors degree in
11 molecular biology. And he said in the fall of
12 1966, he was hired by Pan Am to run a
13 radiological laboratory and developed and
14 operated the Shadow Shield whole body counter
15 at the Rocket Development Station. So it
16 appears that his involvement with NRDS began,
17 direct involvement with NRDS, according to
18 what he's written here, began in the fall of
19 1966.

20 **MR. ROLFES:** Well, we do have additional
21 information as we indicated about hot
22 particles. This information should be
23 published in Rev. 1 of the, let's see, the
24 internal dose TBD, excuse me, the external
25 dose TBD shortly.

1 **DR. MAKHIJANI:** And as you know, I mean, it
2 wasn't there in the version that we reviewed.

3 **MR. ROLFES:** Right, it was a recent addition
4 after, I guess after the last release.

5 Did we want to go on to four, or are
6 there other questions regarding two and three?

7 **MS. MUNN:** Is there an action on this?

8 **MR. PRESLEY:** On two our action would be to
9 review for completeness when we get the --

10 **MS. MUNN:** Rev. 1?

11 **MR. PRESLEY:** Yeah.

12 **DR. ROESSLER:** What's the -- until we review
13 it then is there any charge to SC&A?

14 **MR. PRESLEY:** As far as I'm concerned, no.
15 I don't see anything unless you all do. I'm,
16 you know, we've got the stuff on the hot
17 particles has come in. I think SC&A is, are
18 you satisfied with the comments that --

19 **DR. MAKHIJANI:** Well, as I said, we haven't
20 had time to review this, but on quick
21 inspection it seems to be a partial response.
22 And so there is a partial response and that's
23 about as much as I can say. And we haven't
24 seen the revision, of course.

25 **MS. MUNN:** So are you going to review it and

1 be very clear on what portion of the response
2 you don't feel was adequate?

3 **DR. MAKHIJANI:** Well, as I said, the hot
4 particle issue goes back to 1951, and this
5 person appears to have been involved from 1966
6 onward. And so I don't know when these
7 procedures were in place, and when they were
8 introduced and so on. So there's still a gap
9 in terms of what happened in the earlier
10 period.

11 **MS. MUNN:** I understand your point. I'm
12 just asking will we have your point clarified
13 in writing --

14 **DR. MAKHIJANI:** Well, if you want it
15 clarified in writing, certainly, we can give
16 it to you, but --

17 **MS. MUNN:** Once you've had an opportunity to
18 see.

19 **MR. PRESLEY:** I think we ought to get that.
20 Is there a consensus of the working group? I
21 have no problem with that.

22 **MS. MUNN:** I'd like to be very clear if
23 there are any outstanding issues once you've
24 taken a look at it. I'd like to be very clear
25 on what those are by the time we meet next.

1 **DR. MAKHIJANI:** So we'll be happy to send
2 you a memorandum.

3 **MR. PRESLEY:** You could do that, send one
4 out. We'll get it to the working group.

5 **DR. MAURO (by Telephone):** Robert, this is
6 John Mauro, just a quick question. I'm
7 listening in, and I heard that there now is a
8 revised version of the TBD that explicitly
9 addresses this issue and also that contain
10 within that revised section is the material
11 that we're discussing related to white papers
12 and these interview notes.

13 I'm also hearing though where we're
14 being basically given authorization to look at
15 this material that is part of a white paper
16 and the other databases and perhaps close the
17 loop as best we can. But we are not being
18 asked to review the new, revised section of
19 the TBD itself, the TBD that's now on the web.

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

21 **DR. MAKHIJANI:** Is it on the web?

22 **MR. ROLFES:** The external dose Revision Zero
23 is, in fact, on the web now. That was the
24 version that you had reviewed that was
25 released right before our previous Nevada Test

1 Site working group meeting. There is the
2 Revision 1 which has been returned to ORAU
3 now. These are just page changes that
4 incorporate additional information about hot
5 particles.

6 So there were some internal comments
7 from OCAS, and they were sent back to ORAU for
8 resolution. So as soon as those comments are
9 resolved, Revision 1 with page change
10 information regarding hot particles will, in
11 fact, be approved and placed onto the
12 internet.

13 **DR. MAKHIJANI:** I'm confused about all these
14 revision numbers. Revision Zero was old from
15 2004, and we reviewed Revision 1 from July
16 2007.

17 **MR. ROLFES:** Okay, I apologize. Revision 1
18 recently had some page changes.

19 **DR. MAKHIJANI:** So is the instruction then
20 that we should review those page changes which
21 relate to hot particles or just the site
22 expert, updated site expert testimony which
23 you're going to send me? I'm not quite clear.

24 **MS. MUNN:** Yes, I agree. It's not quite
25 clear. And this brings up an issue which

1 continues to confuse a little bit. And, John,
2 I need to hear from you on this as well.

3 **DR. MAURO (by Telephone):** I would like to
4 speak to this a bit and look for some
5 guidance. My thinking on this is I'm taking
6 precedent from what we did on Savannah River.
7 When we originally reviewed our, I guess it
8 was called at the time Rev. 2 of Savannah
9 River, and we entered into the close-out
10 process. Along the way in that close-out
11 process, it was acknowledged that a major
12 revision, Revision 3, was, in fact, coming
13 out.

14 What happened at that point is a
15 judgment was made that the revisions were of a
16 substantial nature, sufficient that if we were
17 asked to look at, let's say, major portions of
18 the document, that would be more appropriately
19 tagged as a review of a new site profile,
20 granted perhaps with lesser budget.

21 So I guess what I'm, I'm looking for a
22 little guidance as at what point is a revision
23 to a site profile substantial enough that
24 probably it's appropriate to say that this is
25 a new review, and we move head on as opposed

1 to a continuation of a review of the earlier
2 version of the site profile? So it sounds to
3 me from this conversation that we did review
4 this July 2007 version, and that the new
5 changes that were made were really minor and
6 don't represent the substantial revision from
7 the document that we previously reviewed.

8 So in that vein it sounds like that
9 this next version, this page change, is not a
10 major revision. So I would propose that one
11 of the ways in dealing with the fluid nature
12 of this is that some judgment is made as to
13 whether a major revision to a given site
14 profile is imminent or has already occurred.
15 And if it is a major change and the working
16 group feels that there's a need for review,
17 what this really does is what I would say
18 trigger a new site profile review.

19 Right now I guess I'm not hearing
20 that. I'm hearing that well, there is a new
21 version up that but it's some minor revisions
22 to it. So I guess making that distinction
23 becomes important in terms of what, perhaps
24 what the working group could authorize and
25 what really needs to go to the full Board to

1 authorize.

2 I'm putting this forward as maybe a
3 framework for deciding, you know, what really
4 constitutes a continuation of the close-out
5 process of what we began, and what really we
6 should start thinking in terms of what
7 constitutes a review of a new site profile.

8 **MS. MUNN:** I agree. You have just
9 articulated at considerable length the
10 confusion that was in my mind. What I was
11 trying to attempt to clarify here was my
12 understanding that when we charge SC&A with
13 doing one of these documents, that these minor
14 revisions that go along during this process of
15 going back and forth with the clearing of your
16 items, was a part and parcel of your contract.

17 If we have an entirely new, large
18 document issue, then that is, in my view, what
19 I would expect a question from SC&A as to
20 whether or not this constitutes a new
21 instruction for you to go forth and review new
22 documentation. I had not heard anything here
23 that led me to believe there was anything
24 more, a page change or a few minor revisions
25 in wording or insertions, that would

1 constitute what I would think of as additional
2 instruction from us.

3 Perhaps we need Lew to weigh in on
4 that.

5 **DR. WADE:** And I think you've all defined
6 the issues very well. I think that what we
7 face here is a little bit between, betwixt and
8 between. I don't think that the page changes
9 that Mark are referring to were simply
10 editorial page changes. I think the page
11 changes do encompass some new information with
12 regard to the hot particle issue. So I think
13 that we need to understand that.

14 I think the Solomon-like approach to
15 this is for the work group, if it would like,
16 to ask SC&A to consider the hot particle issue
17 and the information presented recently, be it
18 in the interview notes or be it in the page
19 changes to the soon-to-be-released site
20 profile, and to provide the work group with a
21 concise statement of its reaction to the
22 presentation of the hot particle issue. I
23 don't think that this warrants tasking SC&A
24 with a new quote/unquote site profile review
25 as we did in Savannah River.

1 I think John was right. They have
2 reviewed version one. This is some page
3 change containing new technical information to
4 version one, and I think therefore, SC&A
5 should be tasked, if the work group wishes,
6 with the review of the hot particle issue that
7 would encompass that information plus other
8 information that's been provided to them.

9 **DR. MAKHIJANI:** Might I add some
10 clarification here? Yeah, I agree that in
11 this case it's a very narrow thing, a change
12 that has happened. But there's a little bit
13 of a broader context in which this is
14 happening.

15 Mark, correct me if I'm wrong.

16 The document that we reviewed that was
17 published in July was a complete rewrite of
18 the external dose part of that TBD. We did
19 not review that complete document. We focused
20 only on the outstanding matrix items because
21 that was how we interpreted the working
22 group's charge.

23 **MS. MUNN:** That's what you were asked to do.

24 **DR. MAKHIJANI:** That's right. And then in
25 the course since we had to read the whole

1 document we realized there were just a couple
2 of pages, three or four pages, of other issues
3 that came up that we did not present as
4 findings but as helpful suggestions. But
5 there's also now a full rewrite.

6 Is it a full rewrite of the site
7 description, Mark?

8 **MR. ROLFES:** Yeah, I believe so.

9 **DR. MAKHIJANI:** I believe it is a full
10 rewrite.

11 **MR. ROLFES:** Gene --

12 **DR. MAKHIJANI:** I believe this is a full
13 rewrite of the internal dose. I don't know
14 that, I think there's a substantial rewrite of
15 the environmental dose.

16 **MR. ROLFES:** Gene, could you comment on
17 that? I believe our site description was, in
18 fact, a full rewrite. Our external dose was a
19 full rewrite that SC&A reviewed, and the
20 ambient intakes, is that going to be a full
21 rewrite as well?

22 **MR. ROLLINS (by Telephone):** Yes, it will
23 be. We just about doubled the size of the
24 site description, and chapter four, the
25 environmental intakes or environmental dose,

1 does represent a complete rewrite.

2 **DR. WADE:** Well again for your
3 consideration, when the Board meets at the end
4 of November, we'll talk about tasking SC&A
5 with quote/unquote new site profile reviews
6 for next year. It could be that the work
7 group would like to recommend that the Nevada
8 Test Site site profile be reviewed as a new
9 site profile because of the significant
10 changes. Or you might be comfortable with the
11 level of effort that SC&A has put into it now
12 and not make that recommendation. But that
13 would be the vehicle to get the Nevada Test
14 Site site profile as changed reviewed as a new
15 site profile.

16 **MS. MUNN:** This constitutes the real kernel
17 of my concern here. Once the site profile has
18 been reviewed and issues have been raised with
19 respect to it, then we respond to those issues
20 by covering them in a new document. I'm
21 concerned that the new document then, instead
22 of being reviewed simply for comprehension and
23 covering the outstanding issues, does not take
24 us back to ground zero and start all over
25 again.

1 **DR. WADE:** It should only do that if the
2 Board assigns it as a new document to be
3 reviewed as was the case in Savannah River.

4 **DR. MAKHIJANI:** That doesn't happen
5 automatic.

6 **DR. WADE:** So right now you have SC&A
7 focusing on matrix items as touched upon by
8 page changes and that's what they'll do. If
9 the work group would like the full Board to
10 consider asking SC&A to give a complete review
11 of the new quote/unquote Nevada Test Site site
12 profile, that's within the Board's purview,
13 but the Board has not done that at this point.

14 **MS. MUNN:** Since all of the changes that
15 were made were made as a result of the
16 findings of the original matrix, then it
17 follows in my mind that this is simply a
18 response to the findings and not a new
19 document as such. But that's the issue where
20 one makes the decision as to how much
21 constitutes a new document as opposed to a
22 response to previous findings.

23 **DR. WADE:** Well, if you look at what
24 Savannah River taught us, Savannah River
25 really, the need for a re-review resulted from

1 the fact that the original document was stale.
2 It hadn't been looked at. It sat. Things
3 changed not as the result of an active review,
4 but things change, and therefore, it was
5 thought appropriate for SC&A to take a new
6 look at that document. In this case you're
7 engaged as a work group engaged. It's
8 different. It doesn't mean you can't ask for
9 another review if you like.

10 **MS. MUNN:** Quite different. It doesn't seem
11 reasonable to me. It seems to me that this is
12 a continuation of the same activity since we
13 have had this under review and have had it
14 actively being reviewed for the last year and
15 a half. We haven't really and truly let up on
16 it.

17 **DR. NETON:** I might offer our experience we
18 have with Bethlehem Steel. It's one of the
19 first ones that went through this process. We
20 had a matrix very similar to what is used now.
21 Went through and discussed all those matrix
22 items and went through the comment resolution
23 process, and then at the end of that we issued
24 a new revision to Bethlehem Steel which was
25 never reviewed by SC&A or asked by the working

1 group to review.

2 Now that might be a little different
3 because at that particular point I think SC&A
4 and NIOSH came to a consensus on all the open
5 matrix issues. What's different here, I
6 think, is that you're seeing that there still
7 are some open items that are not going to be
8 addressed.

9 **DR. MAKHIJANI:** In Bethlehem Steel it was,
10 it took a long time, but there were six
11 outstanding, if I remember, there were six
12 outstanding items.

13 **DR. NETON:** We worked it down to six issues.

14 **DR. MAKHIJANI:** And then we had agreement on
15 all of them. And then there were papers or
16 something on --

17 **DR. NETON:** Yeah, there were position papers
18 similar to these white papers that are floated
19 here. And I think that the key difference is
20 though we came to an agreement that the matrix
21 issues were all addressed and closed.

22 **DR. MAKHIJANI:** Right.

23 **DR. WADE:** And that's what we're trying to
24 do.

25 **DR. NETON:** That's what we're trying to do

1 here. So if it's going to stay open forever
2 because consensus can't be agreed to then I
3 don't know where that goes. Because
4 essentially what would happen is SC&A would be
5 tasked with reviewing the new revision that
6 are open matrix items, and they will comment
7 on those open matrix items that weren't
8 addressed in the new revision, and that would
9 be the endless loop.

10 **DR. MAKHIJANI:** Unless the Board stops it or
11 makes a decision that gives you some advice or
12 --

13 **DR. NETON:** Exactly.

14 **DR. MAKHIJANI:** Yeah, I mean, we, whether
15 it's a continuation of the matrix process or a
16 new review or basically from the trenches, it
17 doesn't look that different except if it's a
18 whole new review. Then you really, then you
19 look at the whole document.

20 **DR. NETON:** But the point is you're unlikely
21 to find anything in the revision of a site
22 profile that is going to be different than
23 where our position stands in the matrix. So
24 to commission a brand new review of the site
25 profile, I think would reveal very little

1 other than the matrix has not been completely
2 come to a full resolution.

3 **DR. WADE:** So just to move forward. Where
4 we are now is that by virtue of tracking the
5 matrix, there's a hot particle issue. There's
6 been information generated by NIOSH separate
7 the page changes and within the page changes.
8 And the work group now has to decide if it
9 wants to ask SC&A to look at the hot particle
10 issue within the context of both the page
11 changes and the new information. And if you
12 do, SC&A will do that. If you want to give
13 them some subset of that to consider, then
14 they'll do that.

15 **MS. MUNN:** Well, it was my understanding
16 that that's what we were asking them to do is
17 to look at the new information that's been
18 generated, and then it was my request earlier
19 that once that's done that we see a memorandum
20 from them saying yes to this, yes to this, no
21 to this. We still don't see this covered.
22 That's why I asked for a memorandum being very
23 clear about where any outstanding issues
24 remain.

25 **DR. WADE:** And the new information would

1 include the page changes in the site profile,
2 Wanda?

3 **MS. MUNN:** Yes.

4 **MR. PRESLEY:** Correct.

5 **DR. WADE:** Okay, then that's everything, and
6 it's clear I think.

7 **MR. PRESLEY:** Brad, do you have anything?

8 **MR. CLAWSON:** Yeah, I am. I just want to
9 make sure when we make changes, I know that we
10 -- and I've seen it in other portions where,
11 yeah, we've made some changes. We're
12 addressing, say, the hot particle, but also
13 we've made some other changes. I just want to
14 make sure that all the new information is
15 being reviewed. I just want to make sure that
16 is, because sometimes in the review process, I
17 just want to make sure that everything's being
18 looked at as we go forward, and that's my only
19 concern.

20 **MR. PRESLEY:** Gen, you got comments on this?
21 (no response)

22 **MR. PRESLEY:** Yeah, I think it's a consensus
23 of the working group.

24 Phillip, do you have any comments?

25 **MR. SCHOFIELD:** No.

1 **MR. PRESLEY:** I think it's the consensus of
2 the working group then that SC&A be asked to
3 comment the pages as described and present us
4 with a white paper with their comments on
5 those pages pertaining to the hot particle
6 issue.

7 **DR. MAKHIJANI:** And I guess you'll send us
8 the page changes.

9 **MR. ROLFES:** They're in the matrix right
10 here.

11 **MR. PRESLEY:** Is that agreed by everybody?

12 **MS. MUNN:** Yes.

13 **MR. PRESLEY:** Arjun, is that --

14 **DR. MAKHIJANI:** Sure. I have my notes.

15 **MR. PRESLEY:** All right, and that then is
16 our comment from, that's comment two and
17 three. So anybody got anything else from
18 Comment 3?

19 (no response)

20 **COMMENT 4: ORO-NASAL BREATHING**

21 **MR. PRESLEY:** Okay, let's move on to four.
22 Integration (sic) of hot particles by reactor
23 testing and nuclear weapons testing due to
24 oro-nasal breathing. Needs to be evaluated.
25 This issue will be included in a Board meeting

1 schedule. I don't know when that's to be
2 done.

3 Jim, can you --

4 **DR. NETON:** Let me say a few things about
5 this. I've just been looking this over again,
6 and I --

7 **DR. MAKHIJANI:** It should have been
8 corrected, actually.

9 **DR. NETON:** I think that this was
10 mischaracterized, yes.

11 **DR. MAKHIJANI:** We discussed this last time,
12 and we haven't revised the matrix so since you
13 are revising the matrix maybe I could send you
14 a correction.

15 **DR. NETON:** I know we talked about that.

16 **DR. MAKHIJANI:** There should be a correction
17 from our side then.

18 **DR. NETON:** Yeah, I think so.

19 **DR. MAKHIJANI:** But it's not oro-nasal
20 breathing --

21 **DR. NETON:** Exactly, this is not oro-nasal
22 breathing.

23 **DR. MAKHIJANI:** -- ingestion of hot
24 particles.

25 **DR. NETON:** It's an ingestion of hot

1 particles. Whether it's through oro-nasal
2 breathing or nasal breathing or wherever,
3 they're non-respirable particles, and they're
4 being ingested.

5 **DR. MAKHIJANI:** I'll just write down as a
6 to-do item for from me to send to the working
7 group that that matrix item should be amended
8 to reflect ingestion of hot particles.

9 **DR. NETON:** Because I was reading this, and
10 I thought I wasn't prepared to discuss this
11 whole issue again because I thought this was
12 moving on. And, in fact, I think the
13 interview that was done with the person at
14 Nevada Test Site sheds a lot of light on the
15 ingestion of hot particles through these whole
16 body counts that were done and such. And I
17 think those can be tied very nicely together,
18 but it's not an oro-nasal breathing issue.

19 **DR. MAKHIJANI:** No, no, I --

20 **MR. CLAWSON:** So this isn't one of the
21 overarching issues.

22 **DR. NETON:** No, no, this is a non --

23 **MR. CLAWSON:** This is a totally different --

24 **DR. NETON:** Right, this happens to be a,
25 there's a hot particle, large hot particles

1 that are considered non-respirable that do not
2 enter into the lung model at all. They just
3 never enter the respiratory tract. So what
4 they're saying is you could inhale those.
5 They deposit in the upper airways for whatever
6 reason are swallowed. How are we dealing with
7 that? That has nothing to do with the ICRP-66
8 lung model and oro-nasal breathing.

9 **DR. MAKHIJANI:** That's correct, yes. No, we
10 did talk about this and settled it last time.
11 There just was no formal way to ensure
12 correction into a matrix.

13 **DR. ROESSLER:** So is the ingestion of hot
14 particles settled then? I mean, you agree
15 with the approach or are you talking about the
16 oro-nasal?

17 **DR. NETON:** No, no.

18 **DR. ROESSLER:** So what happens --

19 **DR. NETON:** I think that the issue --

20 I'm sorry, Gen to interrupt.

21 **DR. ROESSLER:** No, so what is --

22 **DR. NETON:** The issue is the ingestion of
23 large non-respirable particles and how NIOSH
24 would account for those. I think it's
25 probably limited to the reactor test sites at

1 this point, but how are we going to deal with
2 that. And my sense is based on what I've just
3 seen from some of those interviews that were
4 done, we need to tie that in with the
5 radiological monitoring programs, and
6 particularly the whole body counting.

7 I think depending on what timeframe
8 those were done they could shed a lot of light
9 on that. And on top of that it appears that
10 there's some assertions here that hot
11 particles were few and far between. We can
12 deal with it, but we need to address that
13 particular issue which is how do we deal with
14 ingestion of non-respirable hot particles.

15 **DR. MAKHIJANI:** And presumably that would
16 not concern the document. We're mostly
17 talking about today that being internal dose.

18 **DR. NETON:** Right, and the issue here about
19 to be included in a Board meeting is exactly
20 the issue that I discussed in Naperville which
21 was the oro-nasal breathing issue that really
22 has nothing to do with this Comment 4.

23 **DR. MAKHIJANI:** Agreed.

24 **MR. ROLFES:** We also have some additional
25 reports and references that we have gotten

1 access to regarding standard operating
2 procedures for radiation safety. Information
3 on re-entry and recovery safety procedures.
4 Information regarding routine support for
5 nuclear detonations and reactor runs, Onsite
6 Radiological Safety Reports, Onsite
7 Radiological Safety Report for 42-A Operation,
8 Onsite Radiological Safety Report for Kiwi A-
9 Prime Plan 116, Kiwi A-Plan 16 Onsite Rad Safe
10 Report, the NRX Experiment and Kiwi B-1A. So
11 these are just a limited sampling of some of
12 the new radiation safety reports that we've
13 got as well.

14 **DR. ROESSLER:** And what dates do those
15 reports cover?

16 **MR. ROLFES:** They span from 1959, let's see,
17 1958, 1959 Rad Safe. Let's see this one. I
18 don't see a date on that one.

19 **DR. ROESSLER:** I guess my question is do
20 they cover that period that we were talking
21 about before that Bruce Church maybe didn't,
22 when he wasn't there, and he didn't comment
23 on.

24 **MR. ROLFES:** Sure, let me take a look here.
25 The Onsite Rad Safe Report for 42-A Operation

--

DR. NETON: 'Sixty-three is the relevant start date there, is it not? Because --

DR. ROESSLER: Yes, because of SEC --

DR. NETON: -- prior to '63.

DR. MAKHIJANI: That might need some clarification, but aren't you reconstructing external doses prior to '63?

MR. ROLFES: External, correct.

DR. MAKHIJANI: So that's how we were reviewing this. If that's not correct then --

DR. NETON: External dose, not internal.

DR. MAKHIJANI: Not internal.

DR. NETON: Right. I'm saying any internal dosimetry issues prior to '63 are really not relevant for discussion or not necessary for discussion.

MR. ROLFES: Well, the 42-A operation, the Onsite Rad Safe Report that we have is from May of 1961. So, yes, it does go back to the time period that ^. The other report was '58, '59 time period.

MR. RICH: And the test runs, '63 and four.

MR. ROLFES: 'Sixty-three, four, okay.

MR. CLAWSON: Well, when you're saying the

1 reactors and stuff, is this the, like Janus,
2 the different propulsion systems that they,
3 like Rover?

4 **MR. ROLFES:** Yes --

5 **MR. CHEW:** Tory and Rover.

6 **MR. CLAWSON:** So it'd be covering --

7 **MR. CHEW:** The ^ Kiwi oversight and ^. Area
8 510 and 501.

9 **MR. CLAWSON:** Cover the Rover experience?

10 **MR. ROLFES:** Yes, it does in fact, and there
11 is information, for example, for Kiwi A plan
12 116 Onsite Rad Safe Report. This is from
13 September of 1960. Let's see, there are
14 charts in here on, let's see, information
15 regarding soil contamination resulting from
16 the tests.

17 **MR. CLAWSON:** That also to cover the
18 cleanup?

19 **MR. ROLFES:** I certainly believe --

20 Gene, I haven't had the opportunity to
21 look through all of these Rad Safe reports
22 that I just recently received. Have you
23 looked at any more of these reports and have
24 anything to add that I haven't mentioned
25 already?

MR. ROLLINS (by Telephone): No, I haven't had a chance to look at them either, Mark.

MR. ROLFES: Okay.

MS. MUNN: So do I understand correctly that Comment 4 should be reworded to read ingestion of non-respirable hot particles by reactor testing and nuclear weapons testing workers by any mode needs to be evaluated. Is that what this statement should say?

MR. ROLFES: Based on our interview also with Bruce, we had some information regarding -- he was one of the personnel that ran the whole body counting unit for Pan Am. And he said that these particles certainly would have been easily detectable. Based on the procedures that were documented and in place for the personnel that were involved with the reactor tests, there were careful surveys done of the personnel. Everyone that entered the area was monitored and time limits were controlled in the area.

DR. NETON: I think Wanda's question was --

MS. MUNN: Yeah - -

DR. NETON: Identify the issue. And I agree. I think you've captured it fairly

1 well.

2 **MS. MUNN:** My read of the material you've
3 provided answers that question, but I thought
4 the issue was is the actual Comment worded
5 properly.

6 **DR. NETON:** I believe that's a fairly good
7 accurate portrayal of what --

8 **MR. PRESLEY:** Can we take that oro-nasal
9 breathing out and input ingestion in there?
10 That should take care of --

11 **MS. MUNN:** Well, ingestion starts it though.
12 If it reads ingestion of non-respirable hot
13 particles by reactor testing and nuclear
14 weapons workers --

15 **MR. PRESLEY:** Needs to be evaluated.

16 **MS. MUNN:** Yeah, needs to be evaluated or by
17 any mode needs to be evaluated, yeah.

18 **DR. NETON:** That sounds reasonable to me.

19 **MR. PRESLEY:** Okay, we will change that.

20 **MR. ROLFES:** Here's the document I was
21 looking for. It's Los Alamos Scientific
22 Laboratory Report entitled the "Environmental
23 Effects of the Kiwi TNT Effluent, a Review and
24 Evaluation". This document does, in fact,
25 have integral gamma-neutron data at various

1 distances from the reactor test as well as
2 information regarding particle size
3 distributions and radionuclide content. There
4 is quite a bit of detailed information in this
5 document as well.

6 **MR. RICH:** Fallout trace.

7 **MR. ROLFES:** Yes, quite a bit of fallout
8 trace, gamma dose rates from clouds passing
9 over information, air concentrations,
10 potential doses to thyroids from radioiodines.

11 **MR. SCHOFIELD:** Is that document posted on
12 the O drive?

13 **MR. ROLFES:** No, I just received it
14 recently, so I'll be happy to make it
15 available to everyone.

16 **MR. SCHOFIELD:** Oh, okay, I didn't see it on
17 the O drive.

18 **MR. ROLFES:** Would the Advisory Board
19 working group like to receive all these
20 documents on the O drive?

21 **MR. PRESLEY:** I would. I'd like that.

22 **MR. CLAWSON:** Just where we can look at
23 them.

24 **MR. PRESLEY:** The issue on this then is that
25 OCAS is addressing this on a single, on a

1 project level. Is that correct, Mark?

2 **MR. ROLFES:** Well, the --

3 **MR. PRESLEY:** There's really nothing else
4 for us to do.

5 **MR. ROLFES:** Sure, it's not really a project
6 level, it's not really one of the overarching
7 issues. It's more of an ingestion issue
8 specific to the NRTS, the Nuclear Reactor Test
9 Station. So what we need to do is determine
10 whether there were people that were
11 potentially ingesting hot particles at the
12 site involved in the cleanup. And what I need
13 to do, and what we need to do is review these
14 documents that we have, and in addition, we
15 can probably clarify some of our interview
16 information with the interviewee and see if we
17 can directly account for this.

18 **MR. PRESLEY:** Do we need something back from
19 Mark to the working group on their findings on
20 this Comment then?

21 **MS. MUNN:** Yes, I think Mark is going to
22 give us an overview of what you see after
23 you've reviewed the documentation, right?

24 **MR. ROLFES:** Correct.

25 Gene, will we be able to provide an

1 overview of the hot particle ingestion issue
2 then?

3 (no response)

4 **MS. MUNN:** Essentially broaden the response
5 that you have here.

6 **DR. WADE:** Gene, you might be on mute if
7 you're speaking.

8 **MR. ROLLINS (by Telephone):** You're right, I
9 was on mute. Could you ask the question
10 again, please?

11 **MR. ROLFES:** Gene, I just wondered if we'd
12 be able to provide a little bit more detailed
13 description of the hot particle ingestion
14 issue now that we have these additional
15 reports. We certainly need to look at all
16 these Rad Safety reports.

17 **MR. ROLLINS (by Telephone):** Yes, we can do
18 that.

19 **DR. ROESSLER:** It seems that by the time we
20 get done to the, with this whole package, we
21 will have to develop a timeline and actions to
22 do with the whole NTS site, and this would be
23 one of them.

24 **MR. SCHOFIELD:** One quick question on the
25 ingestion of the hot particles. How soon

1 after these ^ people did the re-entry or in
2 the cleanup did they undergo a whole body?

3 **MR. ROLFES:** Well, if we take a look at the
4 interview that we have, based on the controls
5 that were in place, the personnel that did the
6 re-entries went in and they actually have
7 information in one of these Rad Safe documents
8 regarding the number of particles that they
9 were able to measure within a square meter.
10 And you can see that they rapidly disappeared.
11 They rapidly decayed within a day or two.
12 That was also confirmed by the interview that
13 we had completed. So based on what we are
14 aware of, based on interviews in the technical
15 data that we have, individuals that would go
16 into the hot area were surveyed as they
17 exited. If there was any contamination found
18 on these individuals, they were, in fact,
19 taken to have a whole body count. I don't
20 know the exact timeframe. That is something
21 that we can clarify as well. So --

22 **MR. SCHOFIELD:** So this may not turn out to
23 be an issue at all.

24 **MR. CLAWSON:** So that would cover their
25 respiratory requirements and so forth for them

1 to be able to re-enter into --

2 **MR. ROLFES:** These individuals were dressed
3 out in anti-contamination. These persons had
4 dosimeters on, both pocket ionization chambers
5 as well as film badges for TLDs, I believe, at
6 this time --

7 **MR. CLAWSON:** I was looking more toward the
8 respiratory --

9 **MR. ROLFES:** -- and respirators --

10 **MR. PRESLEY:** They all had, most of them
11 that I remember, had the full head shield on
12 with the respirator and an air pack.

13 **MR. CLAWSON:** Now when we say hot particles
14 in a square meter dissipate, now that's decay,
15 that's not blow away.

16 **MR. ROLFES:** They are decaying very rapidly.
17 Their half-time is ^.

18 **MR. CLAWSON:** I know the wind never blows in
19 Nevada, but it's just a question.

20 **MR. RICH:** Your calibration is just
21 different.

22 **MR. CHEW:** I just want to put it in
23 perspective. You remember this information
24 was really to understand the characteristics
25 of the reactor itself, it was part of the

1 tests, in addition to obviously the safety
2 side of it, but to understand particles,
3 particle sizes, was really what was happening
4 to the reactor itself.

5 MS. MUNN: That's why they were doing it.

6 MR. CHEW: Exactly.

7 MS. MUNN: It was the focus of the
8 experiment.

9 MR. CHEW: So we're gleaning the information
10 from this as beneficial because of the
11 experimental nature of ^.

12 MR. PRESLEY: I have item four then. The
13 CDC is going to revise the Comment on hot
14 particles and get back to the working group
15 with their revision. We will look at that
16 then.

17 Is that all right, Mark?

18 MR. ROLFES: Certainly. We'll go through
19 these Rad Safety reports and try to summarize
20 some of the important things and to page white
21 paper or some other technical document.

22 MS. MUNN: Probably just an expansion of the
23 response more than likely will be adequate
24 unless you discover something astonishing.

25 **COMMENT 5: MASS-LOADING APPROACH**

1 **MR. PRESLEY:** Comment 5, resuspension model,
2 mass loading -- let's see, on this one ^ will
3 review for completeness. To my knowledge
4 there was no action on Response 5 that we
5 needed to take. A white paper from Gene
6 Rollins on the ambient environmental intake at
7 the Test Site has been incorporated into the
8 Technical Basis Document, or the, not the
9 Technical Basis Document.

10 **MR. ROLFES:** That's right. It is in the
11 Technical Basis Document. It has not been
12 publicly released yet. It's still a draft
13 Technical Basis Document.

14 **MR. PRESLEY:** Okay.

15 **DR. MAKHIJANI:** And I believe we had
16 provided you with some comments on that.

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

18 **MR. ROLFES:** Gene, could you -- Gene?

19 **MR. ROLLINS (by Telephone):** Yes.

20 **MR. ROLFES:** We'll have to make sure you can
21 hear me. Could you provide some updated
22 information regarding the intake model? Did
23 you address any of the SC&A comments that we
24 received?

25 **MR. ROLLINS (by Telephone):** Yes, I did.

1 **MR. ROLFES:** Okay, wonderful.

2 **MR. ROLLINS (by Telephone):** Most
3 importantly, I think some of the fission
4 activation correction factors where I'd done
5 it for ten years, I broke those out into
6 individual years so we got a little better
7 handle on what the early time correction
8 factors would look like. But I made every
9 attempt to respond to all of those comments,
10 and I revised that paper. And then I used
11 that to help revise chapter four which is
12 currently under review.

13 **MR. ROLFES:** Great. Thank you, Gene.

14 **COMMENT 6: AVERAGE AIR CONCENTRATION VALUES**

15 **COMMENT 7: RESUSPENSION DOSES**

16 **MR. PRESLEY:** There's nothing we need to do
17 with five, and if you will go on over to six,
18 it has to do with the site average air
19 concentrations. Then you have a notation here
20 that it says, "See Response 5." On this one
21 it would be five and six together. Anybody
22 have any comment?

23 **DR. MAURO (by Telephone):** This is John
24 Mauro. I see that five, six and seven really
25 are all linked.

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

2 **DR. MAURO (by Telephone):** And I recall that
3 we've been through a process here where, in
4 other words, the discussion we just had on
5 five related to Gene's report, the white paper
6 that originally came out on July 29th, 2007, I
7 believe. And then we provided comments
8 subsequent to that. And then what I just
9 heard is that was there another white paper
10 issued after that or is the next place where
11 the concerns that we raised in the most, the
12 July 29th, concerns we raised regarding your
13 July 29th white paper, are those now addressed
14 in the TBD?

15 **MR. ROLLINS (by Telephone):** This is Gene
16 Rollins. John, I think the latter is what
17 you're going to see. I responded to SC&A's
18 comments, and then I took the revised white
19 paper and incorporated those methodologies
20 into the revision of chapter four which is
21 currently under review.

22 **DR. MAURO (by Telephone):** Okay, so then
23 would I be correct in saying that the issues
24 raised in five, six and seven are right here
25 in the matrix. The latest position and

1 response in dealing with those issues is about
2 to be published in a new revision to the TBD?

3 **MR. ROLLINS (by Telephone):** That's correct.

4 **DR. NETON:** But, Gene, I thought I heard you
5 say that you had revised the white paper to
6 respond to SC&A's comments.

7 **MR. ROLLINS (by Telephone):** That's correct.
8 I have.

9 **DR. NETON:** So if there's such a document, I
10 just wanted to resolve this if the matrix
11 process that revised document could not be
12 provided for SC&A to review. We're trying to
13 resolve the issues here, and we stay clear of
14 these site profiles themselves, then that
15 would seem to be the relevant document to
16 produce.

17 **DR. MAURO (by Telephone):** The latest
18 version of your white papers, the sequence
19 that came out, I have as dated July 29, 2007.
20 Is there a more recent one that was put out
21 and perhaps I just didn't see it?

22 **DR. NETON:** I don't think it was put out. I
23 think --

24 **MR. ROLLINS (by Telephone):** It's still in
25 draft form.

1 **DR. MAURO (by Telephone):** Okay, the white
2 paper, okay.

3 **MR. ROLLINS (by Telephone):** Revised white
4 paper is undergoing reviews simultaneously to
5 the chapter four. We decided to do that to
6 streamline the review process somewhat.

7 **DR. MAURO (by Telephone):** Got it. Okay.

8 **DR. WADE:** It would still be helpful for
9 that revised white paper to make its way to
10 SC&A.

11 **MR. ROLLINS (by Telephone):** I guess that's
12 Mark's call.

13 **MR. ROLFES:** Sure, we can certainly provide
14 it. I didn't know if it would be more
15 appropriate though to provide it in the final
16 approved version of the site profile.

17 **DR. NETON:** Yeah, I think we need to focus
18 on the process here. And the process is to
19 resolve the Comment Resolution Matrix. And I
20 think if we can resolve it with the white
21 paper level, in my mind I think it works
22 better than getting the site profiles involved
23 in the mixture. I mean, site profiles will
24 ultimately reflect what is resolved at this
25 level, but --

1 **DR. MAURO (by Telephone):** Jim, I agree.
2 That worked very, very well on Bethlehem
3 Steel, and the reason why when we were in a
4 way fortunate that there was a sequence of
5 white papers that went back and forth, and we
6 resolved it. And then subsequent to all that,
7 perhaps several months later, was when the
8 revised site profile came out. It was a
9 little clean that way.

10 And I agree that this is certainly
11 something that the working group would look to
12 guidance for, but if for all intents and
13 purposes your next version of your white paper
14 that you currently have in preparation, if
15 that could be made available, then we could
16 look at that. And that would really, and
17 then, of course, that might end it. We may
18 have some comments on it. But it does make
19 for a nice barrier between the close-out of
20 the matrix issues and not enter into a review
21 of perhaps a chapter or section of a TBD that
22 has undergone major revision. I think it
23 makes it easier for us, too.

24 **DR. NETON:** I also strongly suspect that the
25 white papers tend to have a little more

1 explanatory background information in there
2 about the issues as opposed to the site
3 profile, which might end up being a little
4 more streamlined because of the nature of the
5 document unless it becomes incorporated as a
6 whole appendix. At this point it really
7 doesn't matter, but --

8 **DR. MAURO (by Telephone):** So what I'm
9 hearing, and again, I would suggest that
10 perhaps the process for closing out issues
11 involves just a sequence of white papers that
12 are triggered as a result of these work group
13 meetings. And the revisions to the TBD that
14 eventually emerge from the process or during
15 the process, be not part of our review.

16 In other words, this idea of cycling
17 through white papers seems to be a way in
18 which we could contain the process in a
19 focused way and close out issues that are
20 associated with our original site profile
21 review. I guess I'd look to Mr. Presley and
22 the rest of the working group if that would
23 become a mode of operation that maybe we use
24 not only on this site profile review but
25 others.

1 **MR. PRESLEY:** I think that's a good
2 approach.

3 **DR. WADE:** It won't always work.

4 **MR. PRESLEY:** No.

5 **DR. WADE:** Sometime when we talk about the
6 hot particles, I guess, the intellectual
7 content is contained in the page changes; and
8 therefore, they have to look at that.

9 **DR. MAURO (by Telephone):** Okay.

10 **DR. WADE:** If possible, keeping focus is a
11 good thing.

12 **MR. PRESLEY:** So the action item here is
13 Mark's going to give you the copy of the white
14 paper for you all to review on Gene's response
15 to item seven. Is that correct?

16 **DR. MAURO (by Telephone):** I think a
17 response to five, six and seven. Am I
18 correct, Gene?

19 **MR. ROLLINS (by Telephone):** Yes, that's
20 correct.

21 **MR. PRESLEY:** All right, anybody have any
22 questions?

23 (no response)

24 **COMMENT 8: EXTERNAL DOSE DATA FOR 1963-1966**

25 **MR. PRESLEY:** Move right on to Comment 8.

1 The use of 1967 external dose data for '63
2 through '66 is not claimant favorable. And
3 let's see. The working group has reviewed for
4 completeness, and I don't see that we need
5 anything on that. Does anybody have any other
6 comments on eight?

7 **DR. MAKHIJANI:** I had a question for Mark.
8 This is being incorporated into your revision
9 of the environmental dose. It says here
10 chapter six. Did I miss it?

11 **MR. ROLFES:** This also, I believe the
12 chapter six, Rev. 1, page change one, that's
13 currently in draft. I believe the information
14 may be the coworker dose table that was
15 inserted into there.

16 **MR. ROLLINS (by Telephone):** Mark, Mark,
17 this is Gene. Excuse me just a minute. I
18 think this originally related to ambient
19 environmental dose.

20 **MR. PRESLEY:** That is correct.

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

22 **MR. ROLLINS (by Telephone):** And we settled
23 that one because of universal badging. We're
24 not adding ambient environmental dose to
25 anyone after 1957.

1 **MR. ROLFES:** Yes, that's correct.

2 **DR. MAKHIJANI:** Because we did not review
3 this item as part of our review because I
4 didn't see that as belonging there. As Gene
5 said, I think this issue is actually resolved.

6 **MR. PRESLEY:** Right.

7 **MS. MUNN:** It says we were to review it for
8 completeness. As far as I'm concerned it's
9 complete.

10 **COMMENT 9: LACK OF ENVIRONMENTAL EXTERNAL DOSE DATA FOR**
11 **1968-1976**

12 **MR. PRESLEY:** Nine is lack of environmental
13 external dose data for '68 through '76. And
14 that again is part of Response 8 and is
15 complete. It's been taken care of.

16 **COMMENT 10: PRE-1963 EXTERNAL ENVIRONMENTAL DOSE**

17 Ten, the TBD does not provide any
18 guidance for pre-'63 external environmental
19 dose. Issues related to unmonitored workers.
20 And on that, let's see, we said that we were
21 complete with that. Coworker external dose
22 information has been added to the TBD. TBD
23 page changes approved on 1/11/07. To me that
24 would be complete.

25 **DR. MAKHIJANI:** This is something we have

1 not seen.

2 **MR. ROLFES:** Okay, we had added a coworker
3 dose table to the -- this is what I was
4 referring to before, the coworker dose table
5 was added to the Technical Basis Document. It
6 was only added up until 1957. Those annual
7 doses were only incorporated until '57. That
8 has now been extended beyond '57 as well.

9 Gene -- and this information is in
10 chapter six, Rev. 1, page change one which is
11 currently in draft and undergoing internal
12 comments.

13 **DR. MAKHIJANI:** Right, that's what I meant.
14 Because there's been a number of changes in
15 chapter six since we reviewed it, not just
16 that one that we talked about. The page
17 changes in volume six of the site profile
18 don't only relate to the items two and three
19 that we talked about.

20 **MR. ROLFES:** Correct, there are, there are -

21 -

22 **DR. MAKHIJANI:** There are other page
23 changes, too.

24 **MR. ROLFES:** There are other page changes
25 that address some of these other matrix items

1 as well.

2 **DR. MAKHIJANI:** I wasn't aware of that.

3 **MR. ROLFES:** And we documented that this
4 particular page change is on page 42 of the
5 revision. So we've specifically identified
6 where the changes are taking place to make it
7 easier to review.

8 **DR. MAKHIJANI:** Right, and all I'm saying is
9 that we haven't looked at that.

10 **MS. MUNN:** That will be picked up in the
11 review that we --

12 **MR. PRESLEY:** It will be picked up in the
13 review?

14 **DR. MAKHIJANI:** Well, yeah, if you wish,
15 yes.

16 **MR. CLAWSON:** Yes, we need to have that
17 reviewed.

18 **DR. MAKHIJANI:** So will you send us all the
19 page changes in chapter six?

20 **MR. ROLFES:** They're written in.

21 **MS. MUNN:** I think they're all listed here.

22 **MR. ROLFES:** Yeah, they're written in.

23 **DR. MAKHIJANI:** So when you send them to us
24 you'll send them to us all together.

25 **MR. PRESLEY:** Yeah, it's here.

1 **MR. ROLFES:** In the response.

2 **MR. PRESLEY:** Section 6 --

3 **DR. MAKHIJANI:** This is the substance of the
4 page change or?

5 **MR. ROLFES:** This information will allow you
6 to find the updated information. So it
7 indicates that the information can be found in
8 Section 6.4.1.1, page 42. As soon as the
9 document is approved, we'll make sure that the
10 page numbers stay the same, and we'll forward
11 that.

12 **DR. MAKHIJANI:** All I want to say is that we
13 don't have this PC-1, PC-01 version.

14 **MR. ROLFES:** No, no, you do not at this
15 time.

16 **DR. MAKHIJANI:** You need to send that to us
17 before. That's all I wanted to say.

18 **MS. MUNN:** Hard to review it without having
19 it.

20 **DR. MAKHIJANI:** Right, it's not here.

21 **COMMENT 11: CORRECTION FACTORS FOR EXTERNAL**
22 **ENVIRONMENTAL DOSE**

23 **MR. PRESLEY:** Comment 11 is correction
24 factors for external environmental dose due to
25 the geometry of organs related to badge and

1 angular dependence of the dose conversion
2 factors needs to be developed. And the
3 Comment on that was working group reviewed for
4 completeness.

5 And I think that NIOSH agrees that an
6 assessment of job types may be necessary to
7 determine which ones need correction factors
8 for angular dependence and geometry. A worker
9 category job matrix has been added to the TBD,
10 and it gives this addition at the bottom of
11 that. It has been approved by OCAS on
12 10/1/07.

13 **MR. ROLFES:** That I did send out to the
14 working group members as well. That was the
15 site description, Technical Basis Document of
16 the ^ site profile.

17 **DR. MAKHIJANI:** And we have not looked at
18 that.

19 **DR. ROESSLER:** Are we adding these pages
20 then to SC&A's assignments, page changes that
21 you mentioned?

22 **MR. PRESLEY:** Now this one the page changes
23 are page 35 through 36.

24 **MR. ROLFES:** That's part of the external
25 dose TBD which is still -- well, I believe

1 that information was incorporated in the last
2 go round, and I believe I don't know if SC&A
3 was asked to look at these specific page
4 changes the last time. However, the job
5 matrix issue was addressed in the site
6 description.

7 **DR. MAKHIJANI:** I must confess I treated
8 this as part of an environmental dose review
9 and so did not address it as part of the
10 external dose issues. I only went through --
11 the way I sort of asked our team to work, and
12 the way I put the paper together was I went
13 through all the items that related to external
14 dose and left out all the items that related
15 to internal dose and environmental dose in
16 site description and every other piece of the
17 TBD.

18 And so I might, it looks like this is,
19 even though it's labeled environmental dose,
20 it is in the, in volume six. So I think we,
21 I'm pretty sure that I missed this because
22 it's labeled environmental dose. I didn't
23 call this out in our white paper as a specific
24 item to review. Yeah, I didn't.

25 **MR. CLAWSON:** What you're saying is you need

1 to be able to look at this?

2 **DR. MAKHIJANI:** Well, yeah. Yeah, I guess
3 it was just a screening method. When we're
4 not asked to review the whole document, I used
5 a minimal screening method to go through the
6 document and pull out the items that related
7 external doses that were identified in the
8 matrix. And I restricted pretty much, except,
9 you know, we found some other things while
10 reading the sections and culled them out. But
11 we did not review the, as I said, we did not
12 review the whole document.

13 **MR. PRESLEY:** According to the document here
14 this has already been approved.

15 **MS. MUNN:** How extensive is that job matrix,
16 Mark?

17 **MR. ROLFES:** The job matrix, Gene, could you
18 explain what we put into the site description
19 for the job matrix, please?

20 **MR. ROLLINS (by Telephone):** What we did
21 here was we went in and looked at the geometry
22 independence. And we determined that
23 correction factors would be either equal to or
24 less than one. And so there were no
25 corrections that were called for. And that

1 evaluation is included in the TBD.

2 **MS. MUNN:** So is this out?

3 **MR. ROLFES:** Well, that's in the external ^.

4 **DR. MAKHIJANI:** It's like two different
5 pieces here I think, volume two and there's
6 volume six, neither of which we looked at.

7 **MR. ROLFES:** Gene, do you know the specific
8 area where the job matrix is in the site
9 description?

10 **MR. ROLLINS (by Telephone):** I'd have to go
11 look that up, Mark.

12 **MR. ROLFES:** Okay, I'm looking through right
13 now. Let's see, I do have Attachment C here,
14 NTS Contractor Job Titles and Exposure
15 Potential Review, job title references. This
16 appears to be from page 73 to 78 within the
17 site description.

18 **MR. PRESLEY:** Can we go ahead and add those
19 pages to what we want SC&A to look at and let
20 them come back with a comment for those few
21 pages?

22 **DR. MAKHIJANI:** Thirty-five, 36?

23 **MR. PRESLEY:** It would be under --

24 **MR. ROLFES:** This was in regards to the site
25 description.

1 **MR. PRESLEY:** Page 77 and 78.

2 **DR. MAKHIJANI:** And this other piece in
3 volume six that we did not review, but they
4 were labeled environmental dose. I did not go
5 over them.

6 **MR. PRESLEY:** Anybody have a problem with
7 that? Let's go ahead and ask SC&A to look at
8 those pages?

9 And, Gene?

10 **MR. ROLLINS (by Telephone):** Yes.

11 **MR. PRESLEY:** This is Bob Presley. If you
12 would, make sure that those are all of the
13 correct pages for that matrix, please, when
14 you get a chance, you or Mark.

15 **MR. ROLFES:** In looking through here I did
16 find some additional pages here. It is in
17 Tables C-1, C-2 and C-3 in the site
18 description. C-1 is the REECo job titles that
19 probably had some potential for workplace
20 external or internal exposures. Table C-2
21 contains information for REECo job titles that
22 possibly had potential for exposures. And C-3
23 is other contractor job titles with some
24 potential for workplace internal and external
25 exposures. And these are from pages 79

1 through 83. So there should be some text
2 description surrounding those pages as well.

3 **MR. PRESLEY:** Lew, do we have a problem with
4 asking that?

5 **DR. WADE:** (Unintelligible).

6 **DR. ROESSLER:** You have to have good
7 eyesight to read those tables.

8 **MR. PRESLEY:** Has anybody got anything else
9 on this?

10 **DR. MAKHIJANI:** Just for clarity, Mr.
11 Presley, the volume six pages 35, 36, 101, 102
12 as I said, we did not review them even though
13 they are in volume six because this item was
14 labeled environmental dose, and I did not
15 review any item that was labeled environmental
16 dose as part of our review because I was
17 restricted to what I thought covered only
18 external dose for people who were badged or
19 not badged in relation to their occupation.
20 And so we can leave it like that, but I just
21 want to let you know that we did not review
22 those pages.

23 **DR. MAURO (by Telephone):** Bob and Lew, this
24 is John Mauro. Again, by way of focusing our
25 activities, it sounds like we have two

1 different -- right now the strategy that is
2 emerging is that either there's a white paper
3 that's issued that addresses our concerns, or
4 there are particular sections in the TBD that
5 has already been issued, or pages. And it
6 sounds like the pages where these issues might
7 be addressed could be in several locations, or
8 it's about to be addressed in a TBD.

9 One approach that we could use when
10 we're dealing with the TBD or soon-to-be-
11 issued TBD sounds like SC&A will receive some
12 direction to go forward and review the
13 appropriate portions of the revised or to-be-
14 revised TBD. And one approach would be where
15 NIOSH would simply point out, review these
16 pages and these tables. And then we would,
17 with respect to the issue at hand.

18 Or alternatively, SC&A could be
19 tasked, please take a look at the TBD and
20 review it with respect to this particular
21 issue. The latter, of course, would be a
22 little bit more open-ended and give us more
23 leeway to take into consideration other
24 material that we might consider to be relevant
25 to the issue at hand. I understand that we

1 should not go outside of the issue.

2 Or I can say the other approach where
3 NIOSH would simply identify the pages, and we
4 would limit ourselves to just the review of
5 those pages and those tables. A little
6 guidance there might be helpful.

7 **DR. WADE:** Well, you've identified two
8 mechanisms, and I think the work group will be
9 specific in terms of which it's asking you to
10 do on a case-by-case basis, John.

11 **DR. MAURO (by Telephone):** Very good, thank
12 you.

13 **MR. PRESLEY:** Do you all want them to go
14 back and review the pages one and two of this
15 document or does, you know, this was strictly
16 for an external environmental dose?

17 (no response)

18 **MR. PRESLEY:** Anybody have a comment?

19 **DR. ROESSLER:** I'm not sure what you mean by
20 pages one and two. I must have slipped away
21 for a minute.

22 **MR. PRESLEY:** Well, there's 101 and 102 --
23 I'm sorry -- of Attachment B.

24 **MR. CLAWSON:** What about 35 through 36?

25 **MR. PRESLEY:** Page 35 through 36 also.

1 **MR. CLAWSON:** Arjun, have you reviewed any
2 of this information going into --

3 **DR. MAKHIJANI:** No. As I said, we went
4 through the whole document but the way I
5 organized what we wrote was according to
6 comment for external occupational dose. So
7 when I organized what our people did, I didn't
8 actually include any environmental dose item
9 in our response in terms of a finding.

10 **MR. CLAWSON:** So really, you may have
11 already had a response, but this is new to
12 this section so we do need to look at it.

13 **DR. MAKHIJANI:** All of us have read, you
14 know, the people, I asked them to read the
15 documents and so it was a complete review, but
16 I got kind of a miscellany of bullet points
17 back from everybody, and I organized them
18 according to external occupational dose only.
19 And I actually didn't organize some of those
20 points. Some things that were errors,
21 comments I just put at the end as
22 miscellaneous comments for NIOSH, but I didn't
23 do an organized review of those items. It
24 wouldn't be complicated to do it. It's just I
25 didn't organize the review in that way.

1 **MR. PRESLEY:** Okay, this is a correction
2 factor issue. To be on the safe side I'm
3 going to say let's go ahead and let SC&A look
4 at these pages, 35, 36 and 101 and 102. If
5 they have a comment on that we would like to
6 have a comment back, please, sir.

7 **MR. ROLFES:** I believe that we were asked
8 whether correction factors specific to
9 environmental contamination needed to be
10 developed. So what we did, we did complete
11 calculations to determine whether
12 environmental contamination from a planer
13 surface of contaminated soil would have any
14 difference in effect on the dose conversion
15 factors for specific organs for external dose.
16 And we came up with an analysis that indicated
17 near unity of dose conversion factors. So we
18 didn't feel that it was necessary to have more
19 specific dose conversion factors that are
20 different from what we have in an approved
21 Technical Basis Document, in an approved
22 Implementation Guide, excuse me.

23 **MR. PRESLEY:** At this time I'd like to take
24 a break, about 15 minutes. Let's start back
25 at ten 'til. Some of us have to go check out.

1 We will be back in here at ten 'til. Is that?

2 DR. WADE: I'm going to mute the phone until
3 ten 'til. John Mauro, are you on the line?

4 (no response)

5 DR. WADE: John Mauro?

6 DR. MAURO (by Telephone): Yes, I had to
7 unmute it.

8 DR. WADE: Would you call my cell phone
9 right now, please?

10 DR. MAURO (by Telephone): I will.

11 DR. WADE: Thank you.

12 I'm going to put you on mute.

13 (Whereupon, the working group took a break
14 from 10:37 a.m. until 10:55 a.m.)

15 DR. WADE: Okay, we're back in session.

16 **COMMENT 12: RADON DOSES IN G-TUNNEL; GRAVEL GERTIE RADON**
17 **DOSES**

18 MR. PRESLEY: This is Bob Presley. What I'm
19 going to do is start with Comment 12. It has
20 to do with radon doses in G-tunnel are not
21 claimant favorable. Also, it talks about
22 Gravel Gerties and radon doses. If you go
23 down to the response, the Gravel Gerties were
24 only used to test designs for Pantex. They
25 were never continuously occupied. This has

1 been put to bed.

2 The working group will review the
3 comments on the TBD when it comes out. As far
4 as the radon dose in the tunnels, let's see,
5 that has been discussed. In fact, we have
6 NIOSH agrees that the -- to issue claimant
7 favorable or higher integrated results has
8 been done. And I think that SC&A has looked
9 at that and concurs.

10 Is that correct, Arjun?

11 **DR. MAKHIJANI:** I believe so.

12 **MR. PRESLEY:** All right, and Response 12 can
13 be put to bed.

14 **COMMENT 13: ENVIRONMENTAL DOSES DUE TO I-131 VENTING**

15 Thirteen has to do with the
16 environmental dose due to venting and the
17 working group that will review this as I
18 understand it, Mr. Smith provided results for
19 bounding calculations. And currently OCAS has
20 this under review. Is that correct?

21 **MR. ROLFES:** That's correct. ORAU has
22 incorporated some example bounding
23 calculations of radio iodine intakes, and we
24 have incorporated that information into the
25 draft Technical Basis Document, the internal

1 dose Technical Basis Document, in Section
2 5.3.3.1 and 5.6.1. This is currently at OCAS
3 undergoing internal comments and so should be
4 released in the near future.

5 **MR. PRESLEY:** Okay.

6 **MR. CLAWSON:** So that means that, Arjun, you
7 haven't seen that yet.

8 **DR. MAKHIJANI:** No. Number two, number four
9 and number five volumes or chapters, I think,
10 are being re-issued, and we haven't seen those
11 yet. Two has been published, but we haven't
12 looked at it.

13 **MR. PRESLEY:** Then what we need to make sure
14 is we get you Section 5.3.3.1, page 41, and
15 Section 5.6.1, page 52, for reviewing this
16 matter. Is that correct? Anybody have any
17 comment on that?

18 **MS. MUNN:** Sounds right.

19 **MR. PRESLEY:** Now, we don't know when these
20 are going to come out. Is that right, Mark?
21 We're still waiting for the OCAS review on
22 this so this is something that may be down the
23 road.

24 **MR. ROLFES:** I'll let Gene comment on that.
25 We recently received a draft from ORAU. I

1 want to say that this is probably being
2 returned back to ORAU with some comments from
3 OCAS.

4 Gene, have you received OCAS comments
5 on the internal five section of NTS?

6 **MR. ROLLINS (by Telephone):** No.

7 **MR. ROLFES:** No, you haven't yet, okay.

8 **MR. ROLLINS (by Telephone):** No, on the
9 internal, no.

10 **MR. ROLFES:** All right, I don't have a
11 timeline.

12 **MR. PRESLEY:** Okay, so what we will do is
13 that the up and coming when that comes back,
14 to get those pages. Those page numbers may
15 change if there are additions or deletions.
16 There's a possibility that those pages may
17 change, so, Mark, if you will get the
18 appropriate pages to SC&A.

19 **MR. ROLFES:** Correct. I'll make sure that
20 the final page numbers are in fact correct.
21 The section should not change however.

22 **DR. MAKHIJANI:** I'd like to just, this isn't
23 the only place where there's a reference to
24 the new TBD, and as I understood from Gene
25 earlier, this is going to be a new TBD,

1 rewritten. As a matter of procedure when we
2 receive a completely new document to read it
3 to get the context of what is being said. Of
4 course, we restrict the review as we did this
5 time pretty much to the items that are
6 mentioned. Now this is just one item. There
7 are a number of other items so I don't know,
8 this is sort of going back to the beginning in
9 a way whether or not to restrict it just to
10 these pages and then come back at a future
11 meeting to other items or...

12 **MR. PRESLEY:** I think that the Board will
13 have to be the person that says that this
14 whole TBD needs to be reviewed.

15 **DR. MAKHIJANI:** So for now we'll just do
16 these two sections.

17 **MR. PRESLEY:** Is that correct, Lew?

18 **DR. WADE:** Correct.

19 **COMMENT 14: INTERNAL DOSE FOR THE PRE-1967**

20 **MR. PRESLEY:** Response 14, it says that
21 there are no internal monitoring data until
22 the late 1955 or 1956, some plutonium from
23 then on, some tritium from '58, plutonium-
24 tritium mixed fusion products from 1961 and
25 full radionuclide coverage established in

1 about 1967. It says that the TBD does not
2 provide sufficient guidance for estimating
3 internal dose for the pre-'67 periods for many
4 radionuclides.

5 The Comment on this was that guidance
6 will be provided in the TBD, how to interpret
7 in a claimant favorable manner gross fusion
8 products, bioassay results. And this goes
9 back to Comment 5 again which states -- I'm
10 going back to it. Production models, it says
11 that the TBD or the, is in review and will be
12 coming out.

13 **DR. MAKHIJANI:** Mr. Presley, only a part of
14 this goes back to Comment 5. A part of this
15 relates to interpretation of bioassay results
16 which is not part of Comment 5.

17 **MR. ROLFES:** Correct, and we are preparing
18 guidance that will be addressed in the
19 internal dose TBD on how to interpret the
20 gross ^ fission product activity.

21 **DR. ROESSLER:** Is this in Rollins' white
22 paper or this is...

23 **MR. ROLFES:** This is what Arjun is
24 mentioning is slightly separate from the
25 resuspension model or the ambient intakes that

1 we're referring to.

2 And, Gene, could you explain a little
3 bit of the difference between some of the
4 updates that we're doing? We agreed to
5 provide some guidance on the interpretation of
6 gross fission product bioassay results in a
7 claimant favorable manner. Now this is a
8 completely separate issue from assigning
9 environmental ambient intakes. Could you
10 elaborate a little bit further on this,
11 please?

12 **MR. ROLLINS (by Telephone):** Right, we had
13 guidance outside of the Technical Basis
14 Document guidance to dose reconstructors about
15 how to interpret gross alpha and gross beta
16 bioassay results. And it basically tells the
17 dose reconstructor what radionuclide, beta or
18 alpha emitter, would be the limiting
19 radionuclide for a particular cancer organ.
20 And that information has now been incorporated
21 into chapter five. But that's guidance that
22 we've been using for several years now. We
23 just made it part of the TBD.

24 **MS. MUNN:** Do we have a good reference for
25 SC&A as far as page number's concerned on that

1 particular item on the gross fission product?

2 MR. ROLFES: Gene, do we have a page number
3 in the internal dose TBD as to where this
4 might be located?

5 MR. ROLLINS (by Telephone): I'll have to go
6 look that up, Mark.

7 MR. ROLFES: Okay.

8 MS. MUNN: Can he get that to Arjun?

9 MR. ROLFES: Certainly.

10 The section number also, Gene, if you
11 could look that up while we continue, that
12 would be great.

13 MR. PRESLEY: Okay, the action item on there
14 is CDC is going to provide to SC&A the page
15 number and a section number to look at on this
16 Response 14.

17 **COMMENT 15: RESUSPENSION OF RADIONUCLIDES**

18 **COMMENT 16: USE OF PHOTON DOSE**

19 Response 15 and 16 have to do with
20 resuspension of radionuclides by the blast
21 wave and also use of the photon dose as done
22 by DTRA. Both of these, as I see it, are
23 spelled out in Finding 12, Issue 5.6.3. The
24 working group is waiting to review this for
25 completeness.

1 Mark, this is a new Technical Basis
2 Document. Is that correct?

3 **MR. ROLFES:** Yeah, the Comments, we're going
4 to get an updated white paper to SC&A that has
5 SC&A's comments resolved in that. The
6 internal dose from atmospheric weapons testing
7 time periods is no longer being reconstructed
8 because of the SEC designation. So our white
9 paper, which assigns ambient environmental
10 intakes will only be covering the period from
11 1963 forward.

12 **DR. ROESSLER:** And that white paper is the
13 white paper we discussed before?

14 **MR. ROLFES:** Correct, that is Gene Rollins'
15 white paper that has been prepared to assign
16 claimant favorable ambient environmental
17 intakes. We did receive comments from SC&A;
18 however, we haven't updated and we haven't
19 released our responses or incorporation of
20 SC&A's comments into the document.

21 **DR. ROESSLER:** So SC&A's specific assignment
22 is when they're looking at this white paper to
23 look at this issue also.

24 **MR. PRESLEY:** As I understand it they have
25 already made their comments once.

1 **MR. ROLFES:** Yes.

2 **MR. PRESLEY:** And CDC has issued their
3 comments back to SC&A or they're getting ready
4 to issue their comments back to SC&A. And
5 what we will get then is a, hopefully, a
6 completed response from this.

7 Is that correct, Arjun?

8 **DR. MAKHIJANI:** I believe so, yeah, John is
9 actually responsible for that.

10 **DR. MAURO (by Telephone):** This is John. By
11 way of Mark a little clarification. It was my
12 understanding in Comment 15 says it was
13 focused specifically on resuspension
14 associated with blast wave is now off the
15 table because that would be the portion
16 covered by the SEC. Am I correct in that?

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

18 **DR. MAURO (by Telephone):** Okay, good, so
19 really what we have here now is Comment 16
20 which could certainly apply to pre- and post-
21 above ground testing. And then what I
22 understand is you will be providing us with
23 page numbers or a white paper that addresses
24 these issues.

25 **MR. ROLFES:** For Comment 16 we will not be

1 using external dose to estimate internal dose
2 as was done by DTRA. That was a separate
3 thing. We sort of skipped over and combined
4 Comments 15 and 16 I guess. But we are not
5 going to be pursuing assigning internal dose
6 based on external dose data.

7 **DR. MAURO (by Telephone):** Does that resolve
8 both 15 and 16?

9 **MR. PRESLEY:** Yeah.

10 **DR. MAURO (by Telephone):** That's what I
11 heard.

12 **DR. ROESSLER:** So there's no outstanding
13 issue on either one of those then.

14 **DR. MAKHIJANI:** That's correct.

15 **MS. MUNN:** Done and done except for our
16 Board.

17 **MR. ROLLINS (by Telephone):** Mark, this is
18 Gene. I have a page number for that
19 additional guidance to dose reconstructors.

20 **MR. ROLFES:** Okay, this is for Response 14.

21 **MS. MUNN:** It is?

22 **MR. ROLLINS (by Telephone):** And it's going
23 to be, we added a Section 5.6.3, and it starts
24 on my page 53.

25 **MR. ROLFES:** Thank you, Gene.

1 **MR. PRESLEY:** Fifteen and 16 are complete.

2 **COMMENT 17: INGESTION DOSES NEED TO BE BETTER EVALUATED**

3 Seventeen has to do with ingestion doses need
4 to be better evaluated. And we have a comment
5 that TBD revision eight-dash-five in draft is
6 currently at OCAS for review. Right now I
7 don't see anything that the working group can
8 do until we get that back for review in pages
9 49 through 54.

10 What, Wanda?

11 **MS. MUNN:** I was just asking Arjun if we're
12 still on Response 17.

13 **MR. ROLLINS (by Telephone):** This is Gene.
14 I'm not sure you're going to find that in
15 chapter five. You're probably going to find
16 it in my revised chapter four.

17 **DR. MAURO (by Telephone):** And, Gene, do you
18 basically adopt OTIB-0018 approach in that
19 section? This is John.

20 **MR. ROLLINS (by Telephone):** Yeah, what
21 you're going to find in my revised chapter
22 four, I've got an ingestion model where we're
23 having the workers ingest 100 milligrams per
24 day.

25 **DR. MAURO (by Telephone):** Okay, so you're

1 not going with the OTIB-0018 approach.

2 **MR. ROLLINS (by Telephone):** No, let me
3 finish. That's for the above ground workers.
4 And what I have proposed to do for the below
5 ground workers is to provide them with that
6 ingestion dose as well as ten percent of OTIB-
7 0018 maximum values.

8 **DR. MAURO (by Telephone):** Okay.

9 **MR. ROLLINS (by Telephone):** So that's why,
10 I'm attempting to provide a reasonable upper
11 bound on what they could have possibly
12 ingested.

13 **DR. MAURO (by Telephone):** I hear.

14 **COMMENT 18: OTIB-0002 FOR POST-1971 TUNNEL RE-ENTRY**
15 **WORKERS**

16 **MR. PRESLEY:** Gene, this is Bob Presley.
17 Then that would take in Response 17 and also
18 Response 18 for the tunnel re-entry workers.
19 Is that going to be in that same section?

20 **MR. ROLLINS (by Telephone):** Well, what
21 we're finding is the early re-entry and
22 recovery individuals typically were required
23 to wear respiratory protection. And this
24 OTIB-0018 approach is only going to be used
25 for those individuals who worked underground

1 who did not have any bioassay data. And so
2 most of the recovery and re-entry people we
3 can reconstruct their internal based on their
4 actual bioassay data. And that's always
5 preferable.

6 **MR. CLAWSON:** Isn't 18 a little bit
7 different though?

8 **DR. MAKHIJANI:** That's what he just said.

9 **MR. PRESLEY:** Yeah, that's what he just
10 said. That it is different. It has to do --

11 **MS. MUNN:** And that would only apply to a
12 portion of that.

13 **MR. ROLLINS (by Telephone):** Originally, 18,
14 I believe as I remember this, was there was
15 the allowance for using OTIB-0002 during
16 certain time periods, but there was not
17 guidance provided as to when it would not be
18 appropriate to use OTIB-0002. And that
19 guidance has been added to chapter five.

20 **DR. MAKHIJANI:** Now I'm confused. Are we
21 talking about two or 18?

22 **MR. ROLLINS (by Telephone):** This one's
23 talking about two.

24 **MR. ROLFES:** He's talking about Comment 18.

25 **MR. PRESLEY:** Well, wait a minute --

1 **MR. ROLLINS (by Telephone):** OTIB-0002.

2 **MR. PRESLEY:** -- Gene, wait just a minute.
3 Seventeen as I see it is complete. We're
4 waiting for the OCAS review, and when that
5 happens then we will give SC&A pages 49
6 through 54.

7 Now, 18 has to do with the tunnel re-
8 entry group --

9 **DR. MAKHIJANI:** Mr. Presley, before you go
10 on. He said he has changed all that and it's
11 in a different volume altogether. So I
12 thought that's what Gene just said that
13 Response 17 is no longer, this section is no
14 longer dealing with Response 17. It's some
15 place else.

16 **MR. ROLLINS (by Telephone):** Right. The
17 incidental ingestion issue is going to be
18 discussed in chapter four.

19 **MS. MUNN:** In the revision it will be in
20 chapter four.

21 **MR. ROLLINS (by Telephone):** Which is
22 currently under review.

23 **DR. MAKHIJANI:** And so presumably there's a
24 section that you'll send us along? Is that
25 what you meant, Mr. Presley? That we should

1 review the whatever section that is?

2 **MR. PRESLEY:** Yes. If it's in Section 4,
3 then we need to get you the pages from Section
4 4 that pertain to Response 17 for review,
5 whatever they be.

6 **MS. MUNN:** And can we take out that
7 reference to OTIB-0018 now then because I
8 think we just heard how OTIB-0018 is going to
9 be used. So we did review 18.

10 **DR. MAKHIJANI:** Yeah, I've noted that this
11 is different than 18 in my matrix.

12 **MR. ROLLINS (by Telephone):** Now Comment 18
13 as I remember -- and this goes back along
14 ways, but what was going on there, there was a
15 specific statement in OTIB-0002 that it would
16 not be used for underground workers. And that
17 limitation was not specifically in chapter
18 five of the NTS TBD. And we have subsequently
19 added that just to assure the dose
20 reconstructors would not use OTIB-0002 for
21 underground workers.

22 **MS. MUNN:** And that was the page 53 change
23 referred to, right?

24 **MR. ROLLINS (by Telephone):** I think that
25 change has been in there before the latest

1 page change.

2 **DR. MAKHIJANI:** I think that this has been
3 resolved some time back because NIOSH agreed
4 to this some time back, and I don't think
5 there should be anything to review here.

6 **MR. PRESLEY:** Okay, so under 17 there's
7 nothing to review.

8 **DR. MAKHIJANI:** Eighteen.

9 **MR. PRESLEY:** Or 18?

10 **MS. MUNN:** Eighteen is done except for --

11 **MR. CLAWSON:** So, Arjun, just so I'm clear
12 on this, what you're telling us is the section
13 of OTIB-0002, you reviewed that where they
14 took out excluding it from underground
15 workers?

16 **DR. MAKHIJANI:** No, Brad, what it said in
17 OTIB-0002 is that it should not be used for
18 Nevada Test Site underground workers, and the
19 first, revision zero, of the NTS site profile
20 allowed it to be used for underground workers
21 even though it wasn't meant to be used. And
22 now that restriction has been placed that
23 OTIB-0002 should not be used at Nevada Test
24 Site, and they've made that guidance to dose
25 reconstructors clear. So that issue is just

1 resolved.

2 **MR. CLAWSON:** I apologize. I'm just a
3 little hard to follow.

4 **DR. MAKHIJANI:** No, lots of procedures.

5 **MR. PRESLEY:** All right, 18's complete.

6 **COMMENT 19: PRE-1966 BETA DOSE**

7 Let's go on to 19. If you would, go back to
8 your six-page matrix, please. Nineteen has to
9 do with beta dose data, and Arjun, do you want
10 to speak about this Comment there? And then
11 we can go from there.

12 **DR. MAKHIJANI:** Our original comment had
13 been that there had been no measurements of
14 beta dose before 1966, and a good bit of our
15 review that we submitted to you was for the
16 material that NIOSH had added to estimate beta
17 dose before 1966. They added three different
18 -- their basic approach was to calculate the
19 ratio of, an estimated ratio of beta dose to
20 photon dose.

21 And photon dose was measured, and they
22 had three different models for that:
23 immersion in a cloud with beta- and photon-
24 emitting particles, surface contamination with
25 beta and photon particles and exposure to a

1 point source. And we had different comments
2 on each of these. Overall, it was a very
3 substantial and detailed response to our
4 comment with a lot of calculations just as a
5 caveat. It was a very lengthy and involved
6 process that NIOSH undertook.

7 We did not try to reproduce the
8 calculations as part of this review. We
9 responded, our comments are sort of restricted
10 to the methodology and not to the numbers
11 because trying to reproduce the numbers would
12 have been very time consuming and cumbersome,
13 and we thought that you should direct us to do
14 that if you wanted us to do it.

15 So in some places we agreed with the
16 NIOSH methodology that called out the summary,
17 let me read the summary into the record so
18 that it's there. Let me find it. Here's the
19 summary that we provided in our review.
20 Status of beta dose for 1966. ORAU Team 2007
21 does not provide an appropriate modification
22 of Hicks' tables for tower and surface shots.

23 With this limitation ORAU Team
24 provides a considerable analysis and in some
25 cases a claimant favorable approach to

1 estimating some beta doses for unmonitored
2 personnel. However, a number of issues remain
3 to be addressed even when the dose estimation
4 approach appears to be reasonable.

5 A validation of the ratios using post-
6 1966 data was not reported in ORAU Team 2007 -
7 - that is the volume six revised external dose
8 document -- so validation of the ratios using
9 post-1966 data was not reported and apparently
10 has not been done. For skin doses up to 1966,
11 issue of dose reconstruction still remains
12 essentially unresolved.

13 And here we agree with NIOSH, that
14 there are no measurements. It's essentially
15 impossible to reconstruct dose, and NIOSH has
16 acknowledged this.

17 And NIOSH acknowledges that, quote,
18 without recorded contamination levels, skin
19 dose is virtually impossible to determine.
20 Hence, pre-1966 dose issue is unresolved.

21 And so that's sort of a summary of it.
22 It's quite an involved review. I can go
23 through some of the highlights. One of the
24 procedural comments was that the Hicks' tables
25 were developed for offsite and need to be

1 modified. The surface contamination beta-to-
2 photon dose ratio would not be claimant
3 favorable for exposures at less than 120
4 centimeters. Especially, they would not be
5 claimant favorable when jobs that involved
6 sitting or being closer to the surface than
7 120 centimeters were involved.

8 And we also found that the efficiency
9 ratio of three-to-five, which is sort of less
10 than some of the ratios mentioned, was not
11 well justified and could be used on dose
12 calculations but not for maximum or best
13 estimate doses. For the immersion dose we
14 found generally the beta-to-gamma ratios to be
15 claimant favorable. There are quite a lot of
16 involved calculations, and we didn't verify
17 them, with the caveat that they can't be
18 reliably applied to skin doses, but otherwise
19 we found the immersion dose ratios to be
20 appropriate.

21 And the other operational areas
22 involved point sources, and there there's a
23 one meter distance to which this has been
24 calibrated, and we found that that was not
25 always claimant favorable. Especially,

1 there's a 30 centimeter standard working
2 distance for the length of the human form and
3 so perhaps a bigger photon ratio for that
4 range needs to be calculated.

5 I think that sort of covers the broad
6 outlines of our review. But there are many
7 other details including six bullet points that
8 are on page seven of our review that provide
9 some comments on Attachment C that I can go
10 through if you like, but they're there for you
11 to look at.

12 **MR. ROLFES:** Significant beta doses are
13 going to be associated primarily with exposure
14 to fresh fission products in immersion in
15 fission products. And these are typically
16 associated with incidents or acute exposures.
17 Anyway, the typical exposures usually involve
18 gamma exposures at Nevada Test Site.

19 In order to specifically address the
20 beta-to-gamma ratio we reviewed approximately
21 200 external dosimetry files. And I'm going
22 to read from this. I just got this. I
23 apologize. I guess I just got it the night
24 before last and haven't had the opportunity to
25 pass it on to the working group members.

1 We reviewed approximately 200 external
2 dosimetry files. They were examined for
3 positive neutron, beta and gamma results. Of
4 the 200 claimant files that we reviewed, only
5 one positive neutron result for one individual
6 was located. But specific to the individuals
7 that were monitored for beta and gamma
8 exposures post-1966, what -- I'll just read
9 this here.

10 Twenty-three of the 200 claimant
11 external dosimetry files contained a total of
12 140 positive beta for shallow dose results.
13 What was readily apparent from the review is
14 that even that when there were positive beta
15 results in a file, they were not the norm.
16 There were a total of 256 positive photon
17 results for the years in which positive beta
18 results were located.

19 The most common situation was a
20 preponderance of non-positive results with
21 several positive beta results usually
22 associated with these positive photon results.
23 These results were analyzed in order to
24 identify an associated beta-to-photon ratio.

25 The beta-to-photon ratios, which were

1 based on annual external dosimetry totals for
2 the years in which positive beta results were
3 available -- this was the post-'66 and after
4 1966 -- a review of the 50 annual ratios found
5 25 of these ratios to be less than one-to-one.
6 Another 13 ratios were between one and two to
7 one. And only three of the 50 ratios were
8 equal to or greater than four-to-one beta to
9 gamma. The largest annual beta-to-photon
10 ratio was 4.1-to-one.

11 I think this will reinforce and
12 demonstrate that our beta-to-gamma ratios that
13 we're assigning are, indeed, claimant
14 favorable.

15 **DR. MAKHIJANI:** If I may just comment, I
16 neglected to ask, I've invited Lynn Anspaugh
17 to join. I don't know if he did. And I know
18 Joe is on the line and helped us with this.

19 Joe and Lynn, did I do justice to your
20 work or did I skip anything?

21 **DR. ANSPAUGH (by Telephone):** Well, this is
22 Lynn. I think you've done fine.

23 **MR. ZLOTNICKI (by Telephone):** This is Joe.
24 I think one issue with the post-'66 data is I
25 had noted that the film badge for a variety of

1 reasons, if there were lower energy betas
2 around, say -- it's very hard to put an exact
3 number on it, but say less than 500 keV betas.
4 They will have been likely missed or severely
5 under reported post-'66 so that using this
6 ratio method would underestimate those lower
7 energy betas.

8 All the lower energy components,
9 depending upon the calibration method, whether
10 or not field calibration was used for those
11 energies and so on. So I think in general
12 what was described by going back and looking
13 in the record sounds impressive, but I would
14 put that caveat there that the badge had a
15 fairly thick wrapper as best I can tell and
16 may have been in a bag most of the time and so
17 was actually missing betas post-'66. So that
18 needs to be considered.

19 **MS. MUNN:** Excuse me, I'm a slow learner,
20 and sometimes when I hear things like that I
21 have a problem grasping exactly the full
22 meaning of what's being said. What you're
23 telling me, I think, is that the badge
24 readings are no good, and we can just throw
25 them out on the assumption that they were

1 never adequate to begin with. Is that what I
2 heard?

3 **MR. ZLOTNICKI (by Telephone):** I hope you
4 didn't hear that, but maybe you did. No, I
5 wouldn't go that far. I would say that for
6 high energy betas the badge is going to detect
7 them well and was presumably calibrated for
8 those betas. But for the component of beta
9 that was lower energy, the betas never
10 penetrated the badge even though they could
11 penetrate through the skin to the depth that
12 could cause damage.

13 So the problem is how are those low
14 energy betas addressed. And that's really the
15 question. And in an intermediate range it can
16 be addressed with the calibration system, but
17 at some lower energies, you just don't see
18 them at all. And so I can't begin to say
19 where on the site lower energy betas would
20 have been an issue other than to say I would
21 imagine there were places where that was an
22 issue.

23 But I'm not the person to speak to
24 those, the exact fields, only to the fact that
25 the badge had a fairly thick coating on it and

1 would have missed any low energy betas anyway.
2 So one can't just hand one's hat on the ratio
3 and simply say, well, we're okay because the
4 post-'66 ratio never exceeded 4.1-to-one.

5 **MS. MUNN:** Well, I'm having a hard time with
6 the fact that we understand what fission
7 products are, and we understand what the
8 emissions are from those fission products.
9 And why we would, therefore, assume that there
10 is a slew of low energy betas that weren't
11 being measured somewhere, I can't make the
12 connection in my mind.

13 **MR. ROLFES:** The average beta particle
14 energy -- excuse me -- we're talking about
15 beta particles that are in excess of 500 keV
16 from fission products where the significant
17 beta doses could occur. So we really don't
18 have evidence to indicate that there were
19 significant low energy beta exposures at the
20 Test Site.

21 **MS. MUNN:** I guess that was my point.

22 **DR. ROESSLER:** What energy did you mention?
23 I didn't get that.

24 **MR. ROLFES:** Five hundred keV would be
25 everything --

1 **DR. ROESSLER:** So less than, he's concerned
2 about the ones less than --

3 **MR. ROLFES:** He's concerned about less than
4 500 keV; however, fission product beta
5 activities for -- excuse me -- beta energies
6 are typically in excess of 500 keV. For
7 example, Strontium-90 is 3 meV, yeah, 3 meV
8 beta particle. So the average energy for that
9 would be 1 meV. It would be a third of the
10 maximum. So fission products are going to
11 typically have high energies.

12 **DR. MAURO (by Telephone):** Mark, this is
13 John. As I understand it is your initial
14 approach -- and I did read our report, and
15 what I'm hearing is that you had a theoretical
16 approach for these three different exposure
17 scenarios as described by Arjun earlier.

18 And am I correct that the models that
19 were used to come up with the ratios were
20 based on understanding what the fission
21 product mix is as a function of time. And
22 therefore, knowing -- and the activation
23 products. Therefore, knowing that mix, and of
24 course, knowing the decay scheme of all those
25 radionuclides, you're in a position to come up

1 with what you think theoretically, not by
2 measurement, but theoretically, what would be
3 the relationship between photon exposure and
4 beta exposure as a function of time and
5 distance from the source.

6 Now what I'm hearing though is that in
7 order to confirm that your theoretical models
8 were reasonable, if not bounding, you also
9 took a look at some post-1966 real-life data
10 to see what the ratios actually were. And you
11 found that your models, at least when you
12 compared to that dataset, were claimant
13 favorable.

14 But as Joe pointed out, there's
15 certainly some limitations for those models in
16 that they're not going to capture some of the
17 low energy beta. But I assume in your
18 theoretical models the low energy beta was
19 captured. Did I ask a question that's
20 tractable?

21 **MR. ROLFES:** Yeah, I certainly think it's
22 tractable, and I think we can take a look at
23 some of the refractory radionuclides in order
24 to demonstrate our approach.

25 **DR. MAURO (by Telephone):** Yeah, so in a way

1 what I'm hearing is that the post-'67
2 empirical data, the real data, I mean, it's
3 information. It gives you some information.
4 It has certain limitations. And the issues
5 that we raise in our report regarding the loss
6 of the refractory materials, I mean, you might
7 be enriched in more refractory materials close
8 to the site.

9 And, of course, this business of the
10 distance to between the receptor and the
11 source might have an effect on some of the
12 ratios you selected. I guess our concern
13 would be to be sure that the ratios that you
14 have selected are reasonably bounding if you
15 were to explicitly consider the refractory
16 radionuclides at perhaps somewhat closer
17 distances.

18 **MR. ROLFES:** So, Gene Rollins, do you have
19 anything to add? Can you make any comments
20 about looking into the refractory radionuclide
21 dataset, I guess, and determine if there's any
22 significant exposure potentials from lower
23 energy beta emitters that we have not
24 accounted for?

25 **MR. ROLLINS (by Telephone):** Yes, we're

1 going to go back into the original
2 spreadsheets and add the refractories back in.
3 We just didn't have time to do that before
4 this meeting.

5 **DR. MAKHIJANI:** Just a couple of comments.
6 The places where some of the beta-to-gamma
7 ratios might be important, some of the higher
8 ones, and the time dependency might be
9 important. Actually, first let me say that I
10 appreciate the post-1966 verification which
11 are the comments that we had raised that
12 should be done, and you've done it. So that's
13 a good thing, and that provides some level of
14 assurance that many of the numbers are
15 claimant favorable. And we'd actually judged
16 many of the numbers to be claimant favorable
17 so that issue, I think, is pretty close to
18 being resolved. I think there's some fine
19 print there, but the question of how you can
20 back extrapolate is a little bit complicated
21 because of the badge question that Joe
22 mentioned, the time dependence and that fact
23 that the beta-to-gamma ratios may become very
24 important when a person is actually caught in
25 some kind of incident of cloud as happened,

1 for instance, with Baneberry or in some other
2 incidents. We've actually compiled a lot of
3 those incidents in a different report that we
4 sent Jim Melius under the 250-day SEC
5 considerations. There's quite a lot of data
6 from actual claimants for circumstances like
7 that. And that's where the, sort of the
8 average ratios over a period of years, numbers
9 of zeros and so on, may not be so relevant.
10 And back extrapolating to pre-'66 might be a
11 little bit complicated, not that it couldn't
12 be done, but I think it would need to be done
13 at some, the validation would still need to be
14 done.

15 **DR. ROESSLER:** I have a question, it's
16 really of Arjun, I guess. If you can identify
17 the radionuclides that were pertinent, and if
18 you can show that there are none in that range
19 where the betas were too low to go through the
20 badge and high enough to be biologically
21 significant, does that remove the question,
22 the whole question here? Or is that just part
23 of it?

24 **MR. ROLFES:** Well, I think we're going to go
25 back and look at the population of refractory

1 radionuclides and add that back in to
2 determine whether it would, to determine
3 whether we would need to assign any correction
4 factors essentially or increase a beta-gamma
5 ratio.

6 Does that answer your question?

7 **DR. ROESSLER:** Well, Arjun didn't say
8 anything but --

9 **DR. MAKHIJANI:** I didn't know there was a
10 real question for me. I mean, we --

11 **DR. ROESSLER:** I'm just asking if Joe's
12 concern is resolved, does that resolve all of
13 your concerns?

14 **DR. MAKHIJANI:** I haven't actually -- Lynn
15 might better address this than me because he's
16 more familiar with radionuclide mixtures.
17 Well, I haven't recently looked at the beta
18 energies over time for how the mix of energies
19 actually evolved. And NIOSH has used the
20 Hicks' tables and the beta energies would be
21 in them. And as I say, we haven't gone into
22 those calculations and tried to verify them.
23 So it's not on the tip of my mind, and so I
24 can't really comment on it. I don't know.

25 Lynn, do you have a ready answer to --

1 **DR. ANSPAUGH (by Telephone):** Well, let me
2 make a couple comments. One is, of course,
3 you do have to add back the refractories, but
4 that's not enough. You have to add back more
5 than the normal amount of refractories because
6 they did fall out on the Test Site and never
7 made it offsite. So renormalizing the Hicks'
8 tables is not a trivial job, and I don't know
9 if that's been figured out or not.

10 I think in answer to Gen's question it
11 should resolve it. The only thing that makes
12 me a little nervous is, of course, any time
13 you have a beta emission, you have a full
14 range of energies, all the way from zero up to
15 the max. And I doubt that that would be an
16 important issue, but I just don't know without
17 doing some calculations.

18 **MS. MUNN:** But if we have good records with
19 respect to all of the incidents involved, and
20 we have decent records as to who was involved,
21 then it's difficult to understand why these
22 more esoteric issues are broadly applicable.

23 **DR. MAKHIJANI:** Because there were no beta
24 dose measurements made until 1966 even though
25 they wore badges, so you have to find some way

1 to calculate it. There was some routine beta
2 dose exposure, some immersion, some surface,
3 you know, all the models that NIOSH has put
4 forth, and so there's both routine and non-
5 routine exposure that needs to be accounted
6 for as best I understand it.

7 And I was just cautioning in regard to
8 back extrapolation that you have to pay
9 special attention to incidents, not that
10 that's the only exposure involved. When
11 there's no measurements, you have to find some
12 --

13 **MS. MUNN:** We do have a plethora of
14 information about the incidents.

15 **MR. ROLFES:** I mean, the information that
16 we've reviewed, the 200 files that we
17 reviewed, included those that received the
18 highest exposures onsite. So once again, the
19 highest, they did a photon ratio that we saw
20 from '66 forward was 4.1 to 1. So this time
21 period there were incidents that occurred in
22 this time period that exposures to fresh
23 fission products. There were certainly
24 similar exposures in the post-1966, for the
25 1966 and later period similar to those that

1 occurred in the earlier time period. So,
2 Gene, do you have anything to add to what I
3 have stated?

4 **MR. ROLLINS (by Telephone):** No, I don't
5 believe so, Mark. Is it possible to see this
6 review?

7 **MR. ROLFES:** Is it possible to see it?
8 Sure, we can put something together I believe.

9 **DR. MAKHIJANI:** Lew, is it useful to think
10 about looking at the beta-photon data, the
11 photon ratios for the Baneberry incident? I
12 presume that many or most or all of those
13 people were monitored.

14 **MR. ROLFES:** Those were incorporated in this
15 review so like I said, we took the highest
16 exposures that were recorded.

17 **DR. MAKHIJANI:** So we'll find that in your
18 review.

19 **DR. ANSPAUGH (by Telephone):** One question
20 about these 200 cases you reviewed. Were they
21 claimants or were they the highest of the
22 whole population?

23 **MR. ROLFES:** These are the highest of our
24 claimant population. You know, I would
25 probably have to clarify with the person, like

1 I said, I haven't had too much time to -- I
2 don't know, well, let me ask, is Carol Smith
3 on the phone?

4 (no response)

5 **MR. ROLFES:** Okay, I would probably have to
6 get clarification because we had gone through
7 the top 100 highest exposures, external
8 exposures at Nevada Test Site, and then we had
9 also expanded our review. But these are only
10 for what we have in our claimant population.
11 These are not from the entire site. These
12 were only from our claimant populations.

13 **DR. ANSPAUGH (by Telephone):** Okay, well I
14 think you have a serious question of whether
15 or not the claimants are representative of the
16 entire population.

17 **MR. ROLFES:** One would expect that there
18 would be, so given our sample size we think
19 that it should be representative.

20 **DR. ANSPAUGH (by Telephone):** I would very
21 much like to see this review.

22 **MR. ROLFES:** Okay, we can see if we can get
23 something.

24 **DR. MAKHIJANI:** This was evidently done in
25 response to one of our comments so I really

1 appreciate that.

2 **MR. ROLFES:** Sure.

3 **MR. PRESLEY:** The action item here is SC&A
4 and NIOSH are going to work out the wording.
5 And who's going to get something back on
6 Comment 19? You know, we had this in our last
7 go around that the TBD and the work was
8 completed and the working group will review
9 for completeness. Again, this is the one that
10 I thought that we had taken care of. Can we
11 get a response from SC&A and NIOSH as to where
12 we stand? Is this going to be completed or do
13 we need to do something else with Response 19?

14 **DR. MAKHIJANI:** I'm a little bit unclear as
15 to what's being asked. I mean, we reviewed
16 the TBD to the extent that the new materials
17 were there after the, and we agreed with some
18 things and didn't agree with other things as
19 specified. Afterwards NIOSH has prepared some
20 new materials that we haven't seen and so
21 there are some outstanding issues, certainly
22 less than there were before. We'd be happy to
23 review the compilation but other than that, I
24 don't know what, I'm not clear on what we're
25 being asked to do.

1 **MR. PRESLEY:** Are you all ^ for a copy of
2 the --

3 **DR. MAKHIJANI:** That's right. I mean, we
4 can certainly review that.

5 **MR. ROLFES:** Yeah, as soon as we get a
6 formal review put together, this was just a
7 summarization of what was done. I'll have to
8 ask for some more formal documentation of the
9 review in order to release it for SC&A's
10 review.

11 **DR. MAKHIJANI:** Well, what the other --
12 sorry.

13 **MR. CLAWSON:** What type of form will this be
14 coming in? Is this just a, will this be kind
15 of like a white paper, just -- I apologize.
16 I'm just curious which way the form is going
17 to come to SC&A.

18 **MR. ROLFES:** Probably in a white paper would
19 be the best format.

20 **DR. MAKHIJANI:** The only other thing I can
21 think of is Gene was saying that they're going
22 to review the question of refractory to the
23 modification of the Hicks' tables, and Lynn
24 opined that this would be a complex matter,
25 and I don't know, there's nothing on the table

1 for us at the present so far as I can see.

2 **MR. CLAWSON:** It'd be complicated to
3 actually get it done.

4 **MR. PRESLEY:** When you start changing the
5 Hicks' tables --

6 **DR. MAKHIJANI:** That's right.

7 **MR. ROLLINS (by Telephone):** This is Gene.
8 It might be helpful if Dr. Anspaugh could
9 suggest a methodology that would be acceptable
10 to the Board to add these refractories back
11 in, and that way we don't have to keep going
12 around in circles.

13 **DR. ANSPAUGH (by Telephone):** You know, I
14 certainly can do that if the Board would like
15 me to.

16 **MS. MUNN:** What kind of methodology do you
17 have in mind, Gene? Lynn, sorry.

18 **DR. ANSPAUGH (by Telephone):** Well, the
19 Hicks' tables are not just a table of
20 radionuclides, they're a table of
21 radionuclides such that they're normalized to
22 external gamma exposure rate.

23 **MS. MUNN:** Yes.

24 **DR. ANSPAUGH (by Telephone):** And this is
25 the complication because every radionuclide

1 has a different conversion factor.

2 **MS. MUNN:** Yes.

3 **DR. ANSPAUGH (by Telephone):** And so if you
4 want to put the refractories back in, it's
5 fine. You put them back in and then you have
6 to re-normalize the table again. And then if
7 you want to add in the refractories that were
8 dropped out, then you have to go through a
9 process to add the refractories in to account
10 for that. And then you have to re-normalize
11 again to external gamma exposure rate.

12 **DR. MAURO (by Telephone):** Lynn, this is
13 John. I was involved in looking at some of
14 this Hicks' tables for some of the tests out
15 in the Pacific. And I recall the lookup
16 tables that were produced, the so-called
17 Hicks' tables. They often, they always gave
18 you the mix of radionuclides with varying
19 degrees of refractory material coming out. So
20 there was like one set of tables would be zero
21 whereby, where they did not take into
22 consideration that refractory material came
23 out. Another set of tables where there was a
24 certain percentage and then a greater
25 percentage, usually were three.

1 So what I was thinking that could be
2 done was that if the table that you're using,
3 that NIOSH is using, currently basically are
4 built around offsite doses, that would mean
5 that they probably are using tables where
6 there was this -- I forget -- ten percent. I
7 forget how they did the metric, but where the
8 refractories came out. But the very same
9 place where they got those tables probably
10 also have the ones with no refractories out.

11 **DR. ANSPAUGH (by Telephone):** Well,
12 unfortunately, John, that's not true.

13 **DR. MAURO (by Telephone):** Oh, okay, because
14 I know I've seen that with several of the
15 tests in the Pacific. I wasn't sure whether
16 the tests are here also.

17 **DR. ANSPAUGH (by Telephone):** Well, Harry
18 Hicks, bless his soul, when he was alive, he
19 only did that for a few cases because there
20 were special requests and the Pacific being
21 one of them.

22 **DR. MAURO (by Telephone):** I see.

23 **DR. ANSPAUGH (by Telephone):** And, of
24 course, Harry -- well, we were concerned about
25 offsite doses. We weren't concerned about

1 onsite doses. For onsite doses you have to
2 allow for the fact that there's an excess
3 amount of refractories onsite.

4 **DR. NETON:** This is Jim Neton. I might
5 suggest this seems like one of these issues
6 that would benefit from a side technical
7 exchange between NIOSH and SC&A including Lynn
8 Anspaugh that we can arrange to discuss and
9 iron out our differences and commonalities on
10 this issue. It sounds like, you know, it's
11 benefited us in the past to sit down and have
12 the right technical people sit down and have a
13 brief, you know, half hour, hour conversation
14 and get the path forward going on this.

15 **MR. PRESLEY:** This is Bob Presley. Jim, can
16 you get that going and then you or Mark, Mark
17 in the working group a short synopsis of the
18 findings on what we have here. And once we
19 iron this out with SC&A and you all then, we
20 have you all's comment back on this one way or
21 the other I think it would satisfy this
22 Comment.

23 **DR. NETON:** Mark, is that all right?

24 **MR. ROLFES:** Certainly, we can set something
25 up.

1 **MR. CLAWSON:** But also kind of the path
2 forward that we're going.

3 **DR. NETON:** I think that technical exchange
4 could really go a long way.

5 **MR. PRESLEY:** You start changing those old
6 records and things like that as I understand
7 that's going to change everything.

8 **DR. MAURO (by Telephone):** I think the key
9 issue here is we might not be able to be, if
10 it turns out it is a difficult challenge to
11 get the refractories back in, there may be a
12 way -- and I'd like to be involved in this
13 because there may be a way to address the
14 issue that's at hand. That is, if you were
15 to, let's say we find that we might have some
16 difficulties doing a precise reconstruction of
17 what the refractories' contribution would be,
18 we might be able to ask ourselves the
19 question; however, does that change the beta-
20 to-photon ratios or is the potential there to
21 create, to change the beta-to-photon ratios to
22 such an extent that it would invalidate the
23 default ratios that have already been adopted.
24 So I don't know whether or not we really have
25 to solve the problem explicitly, but just

1 solve it to the degree that gives us a level
2 of assurance that the ratios adopted were, in
3 fact, appropriately bounding.

4 **DR. MAKHIJANI:** John, I mean, that can be
5 part of the agenda though. You and Lynn and
6 Jim and whoever from the ORAU side could be
7 involved in this.

8 **MR. PRESLEY:** Can we get this completed in a
9 timely manner and get it back to the Board,
10 please, in the next two or three weeks?

11 **DR. NETON:** We can certainly try.

12 **MR. PRESLEY:** All right, that takes care of
13 19. We have an action item for SC&A and the
14 CDC to work out a mutual response to Comment
15 19 and get back to the Board.

16 **COMMENT 20: INTENTIONAL NON-USE OF BADGES**

17 Comment 20 is the revised TBD provides
18 no evidence that the issue on non-use of
19 badges was actually investigated. And I'm
20 going to let -- Arjun, do you have anything to
21 say on this?

22 **DR. MAKHIJANI:** This was maybe the most
23 difficult part of the review for us and for me
24 because, well, not only has the question of
25 are there real criteria for when you're going

1 to accept site expert evidence and when you're
2 not, but because of a particular exchange that
3 occurred at Rocky Flats that I felt at the
4 time was rather problematic and called at
5 least the attention of some people at the time
6 to it, which is at Rocky Flats there were
7 written documents from the time that said
8 thorium strikes were done in Building 71.

9 And NIOSH said we have a site expert
10 who remembers today that 30 years ago thorium
11 strikes were done in Building 81. And the
12 document should be disregarded even though it
13 was a document from the time because it was
14 written by an investigation team that wasn't
15 actually doing the work. So there we have a
16 case where NIOSH's statement was that site
17 expert evidence should be accepted even though
18 it's a 40-year memory over and above an
19 official classified investigation that was
20 done three weeks after the event in question.

21 And I felt very uncomfortable that
22 this was being proposed. I didn't say
23 anything about it because it wasn't
24 particularly appropriate at the time other
25 than in private. But I have said from the

1 beginning in this case that the person who was
2 hired as the principal Health Physicist had
3 been very, very clear -- unfortunately, he has
4 passed on -- his interview was very clearly
5 documented.

6 This is also supported by worker
7 evidence. It is supported by hazard pay
8 policies. There's been many presentations or
9 several presentations to the Board by
10 claimants and their families that this, there
11 was not a policy of non-use of badges, but the
12 pay policies and other pressures of work
13 seemed to encourage this. There's been a
14 substantial amount of uncontradicted evidence
15 that there was a practice of non-use of badges
16 even though it was clearly not approved,
17 people were required to wear their badges.

18 That's not the question. And we, I
19 find it quite hard at this time given what has
20 transpired that NIOSH's position seems to be
21 that because it was the policy, somehow the
22 site expert evidence, even though
23 uncontradicted by documents other than it was
24 policy. Nobody's disputing that it was policy
25 to wear the badge.

1 This is a rather problematic thing,
2 and it would be very helpful to have some
3 guidance as to when you accept site expert
4 evidence, and when you don't because this
5 issue is going to keep coming up. And it has
6 come up not only on the part of SC&A, it has
7 come up on the part of many presentations that
8 we've made to the Board. And it has come up
9 in other contexts in terms of how site expert
10 and worker evidence is being treated.

11 **DR. NETON:** I don't see anything in this
12 response that says that they did not accept
13 the idea the badges weren't worn. I don't see
14 anywhere where it says that in here.

15 **DR. MAKHIJANI:** To me I read it as a
16 rejection of the idea that it was a systemic
17 problem until the mid-'60s.

18 **DR. NETON:** Well now that's different.
19 Whether it's a systemic, prevalence is the
20 issue, not whether they were worn or not.

21 I don't see your argument carries any
22 water that we flatly rejected the testimony or
23 the assertion of a Health Physicist that
24 badges weren't worn. I think we accept that.
25 I think it's just a matter now what is the

1 prevalence. How prevalent was it, and was it
2 sufficiently prevalent to invalidate any
3 potential coworker model that could be
4 developed. I think that's the real issue
5 here.

6 **DR. MAKHIJANI:** Well, it's not just a
7 question of coworker models, it's a question
8 of the validity of the individual data
9 themselves because if the workers were taking
10 off their badges, then how valid are the
11 individual dose --

12 **DR. NETON:** That's my point. That's why I
13 said it's an issue of prevalence. If it's one
14 or two isolated instances, and we have a large
15 cadre of data, are those isolated instances
16 sufficient to invalidate at least the coworker
17 models because we would essentially treat
18 those individuals as unmonitored.

19 If it could be established those
20 people were not monitored, then we would just
21 assume that they didn't have any monitoring
22 and apply a coworker model, then it gets down
23 to prevalence. And I don't know how much
24 documented evidence in terms of the NTS we
25 have if this was a rampant issue.

1 The one expert that we interviewed
2 told us that in the forward areas it was
3 pretty prevalent. I don't, you know, no one
4 has put a number to it, so many percent, so
5 many times, and I don't know that that can be
6 done. In the beginning when this issue first
7 came up, I believe maybe in the very first
8 meeting, NIOSH proposed to do a statistical
9 task in terms of review of claimant data. I
10 don't know that that's ever been done.

11 **MR. ELLIOTT:** I think it was suggested. You
12 all suggested or proposed it, but we pointed
13 to our rule language that indicates how we
14 validate data. We validate it based on trend
15 analysis.

16 **DR. MAKHIJANI:** In any case, so far as we
17 have been able to determine this wasn't just
18 an isolated, there's evidence that this wasn't
19 just an isolated thing to be treated in an
20 isolated manner. And the way I read the TBD,
21 and it was reviewed internally, this is being
22 treated as if it is an isolated case here and
23 there that can be dealt with by individual and
24 claimant file examination. That's an issue
25 obviously that the Board --

1 **MR. PRESLEY:** My stand on this is, you know,
2 we have talked about this at Rocky Flats and
3 talked and talked and talked. We still don't
4 have a firm agreement one way or the other.
5 Yes, there are isolated issues. I think
6 everybody agrees to that, but that's at Rocky
7 Flats. This is at NTS.

8 From my own personal experience at
9 NTS, you wore your badge. You didn't just get
10 checked at the gate when you came in in the
11 morning. There was a guard at the sites where
12 you went in, and it was beat into your head
13 that you wore that badge. And if somebody
14 noticed you'd either dropped the badge, or you
15 didn't have a badge on, then somebody
16 questioned you at that point as to why you
17 were there.

18 You didn't have your badge on, you
19 were in trouble. It was a Security issue.
20 And the problem with the people not wearing
21 their badges, my main point is that it may be
22 an isolated case, but I don't think it was
23 anywhere near a large number of people.

24 **MR. ROLFES:** Based on the additional
25 interview that we did, there was also

1 information that he had heard this, that there
2 were various stories about this practice,
3 about people intentionally exposing their
4 badges as well as intentionally leaving their
5 badges, you know, in a place where it wouldn't
6 be exposed. And he said that he was never
7 able to confirm that the practice existed in
8 fact.

9 He had never seen any definitive proof
10 of it, but it was more hearsay that he had
11 heard of stories that were, in fact, you know,
12 stories that were passed on between workers.
13 We know that, for a fact, that it was
14 certainly a serious security infraction if you
15 were caught without a badge.

16 But the point is whether the practice
17 occurred or not, it was not condoned by
18 management or required by management. We do,
19 in fact, have the methodology, the coworker
20 dose information that we can use to
21 reconstruct doses on a case-by-case basis.

22 **MR. CHEW:** I would like to add, too, Arjun,
23 in working with the construction chapter we
24 obviously looked at dosimetry records. Let's
25 take a look at the reasons here. The reason

1 for taking off your badge and not wearing your
2 badge is that you might think you were coming
3 up to a regulatory limit.

4 And we really look at the doses that
5 were involved. The actual data didn't even
6 come close to that, you know, at the Nevada
7 Test Site. If five rem was the limit, if you
8 were receiving about one or two, because we
9 have a large database of that, so there's
10 really no reason for the people to take off
11 the badge.

12 If you were coming close to the
13 regulatory limit, if you were working, and you
14 wanted to continue working because you were
15 reaching the regulatory limit, then, yeah,
16 maybe some issues of either management or
17 yourself would like to continue to work would
18 allow you to continue to work. There's really
19 no evidence to support that.

20 **MR. CLAWSON:** I'd like to be able to say
21 something, too, because when we went to the
22 Nevada Test Site with our family, we had an
23 extremely interesting tour. The person that
24 was with was very, very good, very, very
25 knowledgeable, no problems with any of them.

1 He was asked this exact question. And his
2 comment was, no, it was not condoned, but the
3 workforce looked at as if they were apart the
4 war, too.

5 And in his comment, he made the
6 comment and said, I would never let a badge
7 get between me and getting this accomplished
8 period, and that's all I'm going to say.
9 Because from that standpoint, too, is that
10 they did, it was drilled into them that they
11 could not, don't do your badges. You've got
12 to have your badges and everything else like
13 that, and this is a conscious decision and so
14 forth.

15 But his comment of I will not allow a
16 badge to get in my way of completing or
17 finishing this. Because, you're right, the
18 regulatory limits or the weekly limits or
19 whatever like that because I can tell you
20 today, and it's by their choice, that some
21 people are doing these things, construction
22 side, our side, because basically to be able
23 to bring finish to a lot of jobs that for
24 people to go in and start up where they've
25 left off, they would receive just as much

1 doses as what this person has.

2 There's a lot of aspects to this, and
3 I just, I agree on both sides of this. I'm
4 just, it seems like every once in awhile we
5 bounce back and forth that we are taking
6 documentation that, okay, we're going to take
7 documentation this time, but now over here
8 we're going to use area experts and back and
9 forth. These can't be bypassed or
10 sidestepped, and we need to really look at
11 this because this is not just on NTS. This is
12 on every site.

13 **DR. ANSPAUGH (by Telephone):** This is Lynn
14 Anspaugh. I'd like to say a few words about
15 this. First of all I never saw anybody not
16 wear his badge, but I was kind of late on the
17 scene. But when I had a badge, I frequently
18 took it apart just to look at it, and you can
19 very easily take your film badge out of that
20 badge or your TLD or whatever, and put it
21 someplace else so you don't have a Security
22 problem.

23 The other thing is I think there were
24 certain periods of time and certain groups of
25 workers who may have felt the need to do this,

1 and that would have gone back to a period of
2 time when there was really an intense push to
3 finish a lot of tests in a short period of
4 time. We felt we were in a major
5 confrontation, competition with the Soviets.
6 And I think if you go back and look at this
7 anecdotal data, you'll find that there are
8 only a few classes of workers where this
9 really was likely to have been an issue.

10 One was the Rad Safe workers who were
11 on the re-entry teams. Another one was the
12 tunnel workers who were being pushed very,
13 very hard to get ready for the next test, and
14 it was very clear to these people that if they
15 went over the limit, they got laid off and
16 maybe they didn't get to work for a long
17 period of time. So I think you really could
18 narrow down this problem.

19 **DR. MAKHIJANI:** Just a couple things, the
20 site expert interview we have, just to address
21 what Mr. Presley was saying, is he felt that
22 this problem stopped around the time that the
23 joint security badge, film badge was issued in
24 1966.

25 By that time it was largely stopped

1 because, for the reason you said, presumably
2 for the reason that you said. People would
3 have found it difficult to be onsite without
4 their security badge, but before that time it
5 was possible to have your security and not
6 have your film badge. And that would also
7 correspond to what Lynn was saying.

8 To my memory, and this is obviously my
9 memory deference to Mark's comment yesterday,
10 but the comments that the Board has received,
11 and what we have seen to this effect are in
12 these groups of workers including in the
13 interview that I did where the person himself
14 said that he had done it himself even though.
15 He was part of the Rad Safe team, and through
16 the clouds, you know, measuring radioactivity
17 and so on. So he was in the front line for a
18 good period of time. And we've also heard
19 this from tunnel workers. So I think it may
20 be possible to focus this issue on those
21 groups of workers that were involved and on a
22 certain time period.

23 **MR. PRESLEY:** Anybody got a path forward?

24 **MS. MUNN:** ^

25 **MR. CLAWSON:** Did you say none?

1 **MS. MUNN:** ^

2 **MR. PRESLEY:** Let's decide what we're going
3 to do here on this one.

4 **DR. WADE:** Well, if you take Arjun's comment
5 as a starting point, so we have Rad Safe
6 workers, tunnel workers prior to 1966. Is
7 there any way to statistically or in any other
8 way get a sense of whether or not this was a
9 prevalent problem? Is there a way to approach
10 by looking at the number of zeros? I mean, is
11 there a way?

12 **MR. ROLFES:** Sure, we've proposed previously
13 if you look at an individual's case file to
14 determine whether they exceeded or, you know,
15 approached an administrative limit in a give
16 quarter. For example, if a Rad worker went
17 into a tunnel, received 3R working in that
18 quarter in that tunnel, went in again. The
19 next quarter received another 3R or whatever
20 the administrative limits are at the time
21 period, of the relevant time period.

22 And then suddenly we notice a drop off
23 indicating that there was no dose received
24 from the following quarter, one could
25 obviously look at the previous three quarters

1 and assign -- for example, if we had
2 indication that a badge was, in fact, removed
3 and that they were working in the work area,
4 we could assign the same dose, we could assign
5 the highest dose received in the first three
6 quarters of the year.

7 So it is something that we can
8 certainly account for I believe. But we would
9 have to review that information on a case-by-
10 case basis. And I think that we had
11 incorporated a statement like that because of
12 SC&A's request. I believe that we had, in
13 fact, incorporated that statement in the
14 external dose TBD.

15 Gene?

16 **MR. ROLLINS (by Telephone):** That's correct.

17 **DR. MAKHIJANI:** It was a case-by-case basis;
18 my response was that this is not a case-by-
19 case issue.

20 **DR. NETON:** I think in line with what
21 Arjun's raised here though, we can go back. I
22 don't know what can be done with this other
23 than SC&A has sharpened their pencil a little
24 bit and are now saying, well, it may just be a
25 class of workers between, in this case up to

1 '66, there were tunnel workers and re-entry
2 workers and I'm not sure --

3 **MR. ELLIOTT:** Well, SC&A look at this and
4 look at this class of workers and tell us if
5 you see something there. We think our
6 approach is sound, and we don't see anything
7 as we go through these individual dose
8 reconstructions. If we find, as Mark has
9 outlined, where there's a trend that looks to
10 us like there's something amiss in the history
11 of the dose and the employment, then we take
12 action on that. And that's one of the ways we
13 validate data.

14 So I would ask if SC&A is so convinced
15 that there's something here, let's see a
16 little bit more of that. What is it? Is it
17 the class? Can you tell us how that
18 particular category of worker is affected? Is
19 it pervasive? Is it all this one set of
20 workers that had to go in and, the carpenters
21 who went back in and took down the barriers
22 that were sitting there? I don't know.

23 I can envision. I truly believe that
24 this happened. I believe that there are
25 situations where a worker said I don't need to

1 wear this badge. Nobody's looking over my
2 shoulder. I'm on the site. I've got to do
3 the job today. I'm maybe getting close to my
4 limit so I'm going to set this badge aside.
5 I'm pretty sure that happened. But I don't
6 believe it happened on a wide-scale basis
7 across the site.

8 I think it was situation dependent.
9 That's my own personal belief. So if that's
10 the case, does our averaging, does our
11 approaches toward reconstructing dose become
12 impaired by this practice? And we're saying
13 to you that we think we can address that in
14 our approaches.

15 **DR. MAKHIJANI:** Well, this, a couple of
16 things. I think the way you put it
17 misconstrues the problem, at least as I've
18 tried to put it on the table. The idea that
19 this is an occasional one-off thing
20 contradicts the site expert evidence that we
21 got in an interview, and even more than one.
22 And that has also been presented before the
23 Board. So that, I think, is an issue, in my
24 opinion -- now, the working group and the
25 Board may dismiss this, and then I will just

1 not raise it any more. In my opinion there's
2 a question of what are the criteria by which
3 site expert evidence is to be accepted? Is it
4 -- right now, the appearance -- well, I'm not
5 going to characterize it.

6 **MR. ROLFES:** Once again, all the sources of
7 information must be considered.

8 **MR. ELLIOTT:** And we have site experts that
9 essentially contradict the assertions that
10 other site experts make.

11 **DR. MAKHIJANI:** So we've had, so right now I
12 am not clear on whether we have a set of
13 criteria by which we're going to accept, or by
14 which NIOSH accepts site expert evidence. And
15 when there's contradictory evidence, do you
16 accept the evidence that you feel comfortable
17 with because it agrees with how you're doing
18 dose reconstruction currently? Or do you re-
19 evaluate that?

20 **MR. ELLIOTT:** We accept the weight of the
21 evidence. We look at all of the information
22 we have at hand, and we make a decision upon
23 that basis.

24 **DR. MAKHIJANI:** And that's why what happened
25 at Rocky Flats truly puzzled me. Is how can

1 you set aside documents from the time for a
2 40-year memory of a person who wasn't even
3 present and didn't even give a document?

4 **DR. NETON:** I don't want to rehash that
5 whole Rocky Flats. If you recall, the
6 building that was cited in that report was
7 sort of ancillary to the report. It wasn't
8 the subject of the report, so it was not
9 really under investigation. It was just
10 included as sort of a, almost like a -- I
11 don't want to mischaracterize it -- but as a
12 side note in that report. It was not the
13 focus of the investigation.

14 So it was quite possible that that was
15 not researched, and it was just misquoted.
16 That's the weight of the evidence you have to
17 look at, into what context that building was
18 cited and why. You're portraying as if it was
19 the focus of the investigation. It was not.
20 In the report it's an ancillary quotation.

21 **DR. MAKHIJANI:** I did not say --

22 **DR. NETON:** That's what I'm saying though.
23 You have to look at the weight of the evidence
24 like Larry suggested.

25 **DR. MAKHIJANI:** I'm presenting a question as

1 I saw it. The weight of the evidence -- and I
2 felt it very serious at the time, and I still
3 do feel it very serious. And this is a
4 problem that arises in a lot of different
5 contexts, and I'm not the only one certainly
6 to bring it. It's a widespread perception
7 that NIOSH doesn't listen to certain groups of
8 people. And I think even unfairly very often
9 negatively affected your program because I can
10 see when you are listening or when you are
11 being fair, people may still have the
12 perception that you're not listening.

13 **DR. NETON:** There will always be someone
14 upset because there's two sides on every
15 issue.

16 **DR. MAKHIJANI:** Right. So I'm just trying
17 to be as objective as I can in this situation
18 which obviously there's a question of judgment
19 involved. We have there a situation where on
20 the datasheets themselves, there was no
21 indication that the thorium strikes took place
22 there. The data were just data without a
23 mention of the radionuclide. You had two
24 documents, one history and one contemporary
25 document from that time that both mentioned

1 exactly the same thing, that it happened in a
2 different building than what NIOSH was
3 asserting. And opposed to all of that you had
4 one person who was there at the time and
5 remembering from 40 years before that it
6 happened in a certain building. Okay. I
7 think that this certainly calls for some
8 question as to what are the criteria because
9 I'm very puzzled because if NIOSH accepts that
10 --

11 **MR. ELLIOTT:** We have spoken to this. We've
12 already provided an answer to this issue in
13 the Rocky Flats deliberation. We explained, I
14 think -- I don't have the details in front of
15 me. I'd have to refresh my memory, but as Jim
16 said, and I think others here can confirm,
17 we've explained this. We look at all of the
18 information at hand. We take all of that in
19 account, and yes, we arrived where we arrived,
20 and we think for good reason.

21 I'm sorry if people out there feel
22 that we are not listening, but we are doing
23 our best to not only listen and then to act.
24 And I know we can improve upon that, and we're
25 striving to do so. It's clearly written in

1 our regulation. It's clearly exhibited, I
2 feel, in our policy, and I hope it's becoming
3 clearer in our practices that we account for
4 all information. We take the weight of the
5 evidence, and we have to decide upon that.

6 **DR. MAKHIJANI:** Well, I'm not representing
7 anybody except the team that I led to do this.
8 And, John, you might stop me if you think I'm
9 out of order here, but I definitely concluded
10 the contrary in the case of Rocky Flats. In
11 my profession judgment I felt that the
12 conclusion that NIOSH arrived at in regard to
13 the weight of evidence as to where this thing
14 happened was not warranted. There needed to
15 be more evidence, at least something that said
16 thorium than a 40-year old memory of somebody
17 who was there. Because 40-year old memory
18 have been treated in a different way in other
19 contexts. Oh, it was long time ago, and it's
20 very hard to remember. And that has --

21 **MR. ELLIOTT:** And I think we've said that.
22 We understand that, but we have not used that
23 as a crutch or an excuse.

24 **MR. PRESLEY:** At this point what we're
25 discussing is the NTS site profile, not the

1 Rocky Flats. We have had problems with this
2 in the past. What I see at NTS is that they
3 have the data to do the coworker models for
4 the people that they cannot find data on.
5 Now, and I'm happy with that.

6 If somebody wants to come up and say
7 working group, you all need to make a
8 recommendation to the full Board that somebody
9 comes back and looks at this problem as a
10 different working group looking at non-badge
11 use on all sites, I have no problem with that.
12 What we're looking at here is the NTS site,
13 and I really think that we have the data to do
14 what we want to do on this site. Rocky to me
15 is a total different question. Now, if I'm
16 out of order, somebody say that, but right now
17 that's my point.

18 **MR. CLAWSON:** Was it Baker, the interview
19 with the Health Physicist down there? The one
20 that has just passed?

21 **DR. MAKHIJANI:** Well, it's published in our
22 site profile review, and I can show it to you.

23 **DR. ROESSLER:** We don't need to mention
24 names.

25 **MR. CLAWSON:** Oh, I just, there's a lot of

1 things stated in there that have to be
2 addressed with that. And you, I don't think
3 that there is in anybody's point of view,
4 we're all trying to do the same job, and we're
5 trying to do it the best we can because all of
6 us basically report back to the people, the
7 claimants.

8 And I don't think that anybody's
9 purposely trying to address it towards that
10 someone isn't doing their job. But we do
11 still have to address the comments that are
12 made. And every time we get into this, this
13 keeps coming up, and we've got to be able to
14 tell the petitioners how we've addressed this.
15 Because this isn't just this site. I know
16 this is the one we're focusing on, but we have
17 to be able to address this in some way.

18 **DR. WADE:** Now I can, just as a commonsense
19 individual, I can propose two ways to address
20 it. But let's define some parameters. Again,
21 Arjun talks about pre-'66 two classes of
22 workers, Rad Safe workers and tunnel workers.
23 Jim says very appropriately that it becomes an
24 issue of the preponderance of the evidence.
25 How large a problem is this?

1 We say, commonsense people say, you
2 can use coworker models but in order to use
3 those coworker models you have to have
4 confidence in those models. And that means
5 that there has to be sufficient number of data
6 points that you build those models on that you
7 can rely upon. This is a pervasive problem
8 and maybe you don't have that. So one way to
9 look at this is to try and address the issue
10 is are the coworker models robust in light of
11 this problem? And I don't know how you do
12 that, but that's one intellectual way to do
13 this.

14 The other way is to just take the sort
15 of the lawyerly approach is, this is an issue
16 of the preponderance of the evidence and have
17 someone prepare a document that lays out the
18 evidence and draws a conclusion and let people
19 debate that. So I think you have two classic
20 approaches if the work group wants to take an
21 approach or the work group could decide it's
22 comfortable on this.

23 But I sense in the work group that
24 there is still some division and there needs
25 to be something done to put this issue to

1 rest. I would hate to punt this and then come
2 to face the 11th hour of the SEC determination
3 and have this issue in front of us.

4 I think there's time now to work on
5 it, and I see two ways: to determine if the
6 coworker models are robust enough given the
7 potential presence of this problem or lay out
8 the arguments with the preponderance of the
9 evidence and see who, what side prevails.
10 Does that make sense? So is there a way to
11 do, there's a way to do the second obviously.

12 **MR. ELLIOTT:** To do both, I think the
13 former, if that were to be done, that would be
14 us. NIOSH should defend its coworker model
15 and the robustness of that. If it's the
16 latter, to develop the argument for why this
17 should be, is a concern, then I think that's
18 something the working group should either
19 develop or have SC&A do.

20 **DR. WADE:** Arjun, do you understand what I'm
21 saying? Are you comfortable with those
22 approaches?

23 **DR. MAKHIJANI:** I'm not sure about the
24 preponderance of the evidence and how one
25 would go about doing it even, you know, the

1 claimant population is first of all a subset
2 of the people who were there, and we're
3 talking about a pretty restricted period. So
4 I would have to consult with people like Lynn
5 and others.

6 **DR. WADE:** Yeah, what you do is just lay on
7 the table in some room the evidence. You'd
8 have people document what it is and then draw
9 a logical conclusion from it.

10 **DR. MAKHIJANI:** The evidence in terms of the
11 expert evidence and the policies that were at
12 the Test Site in terms of the hazard pay
13 policies, we discussed at some length in the
14 site profile. In order to go beyond that into
15 the numbers I really don't know sitting here
16 how you would develop that from the population
17 that worked at the Test Site. Because, I
18 mean, this came up earlier today that we don't
19 know how representative the claimant
20 population is and you can't really establish
21 that. You can assume it's representative
22 because it's large. And in this case you're
23 talking about two small groups of workers. At
24 least as I sit here I can't give you an
25 instant response as to how I would do it. I'd

1 be happy to take it back and talk about it and
2 send you a proposal.

3 **DR. NETON:** I'm against making more work for
4 anybody, but it seems to me the technical
5 evaluation would be worth looking at before we
6 went to this preponderance of the evidence
7 issue. I think the technical evaluation can
8 shed some light on it, and they actually feed
9 into the preponderance of the evidence.

10 **DR. WADE:** I think that's exactly the way it
11 should proceed.

12 **DR. NETON:** And it seems that we've got a
13 couple small groups of workers here, and
14 hearing what Mel said that, and I think it's
15 probably true, that we have a small subset to
16 begin with. And then probably very few
17 workers typically in these populations
18 approach the regulatory limits. So now you're
19 even looking at a smaller subset. I don't
20 know how far down you go, but let's say so
21 many people above a certain rem.

22 And then you can start looking, okay,
23 how many people does that potentially affect,
24 maybe not many to begin with. And then you
25 can look at those and look at the distribution

1 of the coworkers and see is there, indeed,
2 some curvature in this cumulative probability
3 of distribution? Probably going to be as well
4 documented if that happens. As workers
5 approach the administrative limit, they take
6 them out of the workplace. But how bad does
7 that curvature occur and how many workers?

8 I mean, we can put some light on this
9 issue based on these more narrow focused
10 timeframe and the worker population and see
11 what shows up. I can't --

12 **MR. ELLIOTT:** Can we do that not on our
13 claimant population but on the data that NTS
14 holds?

15 **DR. NETON:** Yeah, I think --

16 **MR. ROLFES:** What we currently have in our
17 coworker external dose table it is a -- let's
18 see --

19 Gene, could you please answer Larry's
20 question regarding reviewing the entire set of
21 all of NTS external dosimetry data? Do we
22 have access to data that would allow such a
23 review?

24 **MR. ROLLINS (by Telephone):** As I understand
25 it, we've had difficulty retrieving

1 information that is not claimant related.

2 **MR. ELLIOTT:** Well, DOE has to provide us
3 coworker data which is not claimant-related
4 data. It is coworker data. It's data
5 relevant to a category of workers at the site
6 whether it's all workers or the subcategory.
7 And so if we're having trouble, we'll talk to
8 DOE about that.

9 **DR. NETON:** Let me ask the question, what,
10 do you recall what the coworker data is based
11 on right now?

12 **MR. ROLFES:** Well, we currently have this
13 basically a number of personnel that received
14 a given dose by year, so it's essentially the
15 same information which does incorporate all
16 individuals that worked at the Test Site, and
17 that is currently in the TBD. And I believe
18 we had provided some discussion that this was
19 added to the site profile to address these
20 situations where an individual was potentially
21 not using their badge.

22 **DR. NETON:** I think we need to take a look
23 at what we have.

24 **MR. ELLIOTT:** ^ DeMers have always been
25 helpful to us.

1 **DR. NETON:** I don't want to commit NIOSH to
2 doing a several month investigation here, but
3 since we've got a three-year time window we're
4 looking at possibly with a couple selected
5 worker populations, it might, famous last
6 words, it shouldn't take that long. Now if
7 it's going to be a major research effort, we
8 might need to revisit that and say, you know,
9 take a different tactic. But it's worth
10 looking at technically. Let's look at the
11 data and see what we can find.

12 **MR. PRESLEY:** Okay, on Comment 20 then NIOSH
13 is going to look at the coworker tables and
14 data and get back to the Board with some type
15 of a recommendation on this non-badge uses.
16 Is that correct?

17 **MR. ROLFES:** Now is this specific to a
18 certain timeframe then?

19 **MR. PRESLEY:** Before 1966.

20 **DR. NETON:** Clearly we'll look at the
21 highest exposed workers because that's the
22 only population this really affects, people
23 who have low dose are not going to be inclined
24 to take their badges off unless people want to
25 go there.

1 **MR. ELLIOTT:** That's based on the assumption
2 that the primary motivation is to not get
3 burned out.

4 **DR. NETON:** That's correct, and that's --

5 **MR. ELLIOTT:** And there are other
6 motivations to not wear your badge. We
7 recognize that, but the primary one we assume
8 to be that you don't want to get burned out.
9 I expect you've got readings in the third or
10 fourth quarters in particular, you'll see a
11 drop.

12 **DR. NETON:** We looked at this, I think, at
13 Rocky Flats, and it was fairly inconclusive
14 looking at the technical data, looking at the
15 actual, but we were looking at a much broader,
16 we cast a much broader net there. Here if we
17 focus it a little more narrowly, maybe it'll
18 be easier to look at.

19 **MR. PRESLEY:** Is this concept acceptable to
20 the working group?

21 **MS. MUNN:** Yes.

22 **MR. PRESLEY:** Okay, and then we will get
23 back on this subject at some point in time.

24 Let's break, and we will start at 1:30
25 on Comment 21. Is that all right? Be back

1 here at 1:30?

2 **DR. WADE:** We're going to break the line
3 gentle people, and we'll call back in a little
4 bit before 1:30. Thank you.

5 (Whereupon, the work group recessed for
6 lunch from 12:35 p.m. until 1:35 p.m.)

7 **DR. WADE:** Hello, this is the work group
8 conference room. We're just about ready to
9 begin. Can anybody hear my voice out there?

10 **MR. RAFKY (by Telephone):** This is Michael
11 Rafky. I can hear you.

12 **DR. WADE:** Thank you, Michael. We're about
13 to begin.

14 Robert, are you ready?

15 **MR. PRESLEY:** Yes, sir.

16 **DR. WADE:** Okay, here we go.

17 **MR. PRESLEY:** Do we want to go and see who's
18 on the line again before we start?

19 **DR. WADE:** Well, we could ask NIOSH and ORAU
20 folks on the line to identify themselves,
21 please.

22 **MR. ROLLINS (by Telephone):** Gene Rollins is
23 here.

24 **DR. WADE:** Hi, Gene.

25 Others? NIOSH/ORAU?

1 (no response)

2 **DR. WADE:** SC&A?

3 **MR. ZLOTNICKI (by Telephone):** Joe Zlotnicki
4 here.

5 **DR. WADE:** Hello.

6 Other SC&A?

7 (no response)

8 **DR. WADE:** I'm sure John Mauro will be
9 joining us. I was just on the phone with him.

10 Do we have workers, petitioners, their
11 representatives on the line?

12 (no response)

13 **DR. WADE:** Other feds on the line?

14 **MR. RAFKY (by Telephone):** Michael Rafky
15 again, Lew.

16 **DR. WADE:** Hi, Michael.

17 Board members?

18 (no response)

19 **DR. WADE:** Anybody else who wants to be
20 identified?

21 **MR. SMITH (by Telephone):** Billy Smith with
22 Chew.

23 **DR. WADE:** Okay.

24 **MR. ROLFES:** Before we begin I believe Billy
25 Smith might want to add some comments. He was

1 a former Nevada Test Site Health Physicist.

2 Billy, would you like to make any
3 comments in regards to our earlier
4 discussions?

5 **MR. SMITH (by Telephone):** Yes, I would.
6 Can you hear me?

7 **MR. ROLFES:** Yes, we can.

8 **MR. SMITH (by Telephone):** Yes, I would. In
9 regards to the discussion that Arjun was
10 having regarding the prevalence of employees
11 removing their dosimeters, in the 27 years
12 that I was at the NTS, and I was involved in
13 the Health and Safety Program for all that
14 time. I began my career as a tunnel Health
15 Physicist, and most of the time I spent there
16 was working with the radiation monitors and
17 the miners.

18 And I can say that from 1966 on, I
19 never experienced one occasion where anybody
20 had to remove their dosimeter in order to do
21 work. I can't even remember anybody even
22 being reported as having removed their
23 dosimeter at that particular time. Now one of
24 the things that I do know is that whenever
25 workers, including miners or any other

1 construction workers, had to work in a
2 radiological area, they were accompanied by
3 what we called at that time radiation
4 monitors. Now we call them RCTs.

5 So these workers would have been
6 people who would have received probably the
7 highest external or internal exposures that
8 any other worker at the Nevada Test Site would
9 have experienced. So it would probably be
10 good to do a coworker study that would allow
11 looking at the radiation monitors for any
12 particular era and see what kind of doses they
13 got and see whether or not you can determine
14 from that that whether or not the practice of
15 people removing their badges might have been
16 in use. But again to my knowledge that never
17 happened.

18 **MR. PRESLEY:** Billy, this is Bob Presley.
19 How are you?

20 **MR. SMITH (by Telephone):** Yes, Bob, just
21 fine, thank you.

22 **MR. PRESLEY:** Could you supply us with some
23 names of individuals between 1959 and 1966
24 that might have been the persons in question
25 at the test site? Is it at all possible for

you to do that?

MR. ELLIOTT: Not over the phone.

MR. SMITH (by Telephone): No, I understand that. Bob, I don't know. Like I said, I don't know of anybody who was ever reported by name to have done that. The only thing that I can tell you is this. Is that the dosimetry record system has a difficult time retrieving information if it's not for a claimant. So we would have to go to the personnel records and identify people who were classified as radiation monitors and then have the dosimetry people to retrieve those records of those people to see what kind of exposures they may have gotten.

MR. PRESLEY: Bill, we'll do that.

MR. SMITH (by Telephone): Another, well, there was one other comment that I'd like to make. There was a comment John made this morning about the ratio for the beta versus gamma on the dosimeters, and he was concerned about the fact that the wrapper around the film badge was too thick to allow any measurements of beta particles below 500 keV.

That may have been true for those

1 early dosimeters, but an interesting question
2 that I have regarding his question is then how
3 could people have gotten low energy beta
4 exposures since they were wearing clothing
5 whether it was anti-contamination clothing or
6 personal clothing?

7 **MR. PRESLEY:** Well taken.

8 **DR. MAKHIJANI:** Joe, I think that question
9 was directed at you.

10 **MR. ZLOTNICKI (by Telephone):** Well, I think
11 the answer is with beta you get into a,
12 obviously depending on the site of the cancer,
13 but clearly there are likely to be situations
14 where some of the skin of the body is exposed,
15 most notably the face, but possibly the
16 forearms and hands in some situations as well.

17 **MR. SMITH (by Telephone):** Yes, I agree.

18 **MR. ZLOTNICKI (by Telephone):** And I don't
19 know if people wore shorts there or not when
20 they were in hot zones in hot weather. I have
21 no idea. ^ they got a partial, potentially
22 got a partial skin exposure, not a whole skin.

23 **MR. SMITH (by Telephone):** No, shorts were
24 not allowed.

25 **MR. PRESLEY:** Not at all.

1 **MR. RICH:** Any time there was significant
2 exposures to mixed fission products,
3 contamination control clothing including face
4 shields and most often the respiratory
5 protection.

6 **MR. PRESLEY:** Bill, thank you very much for
7 your comments. We appreciate that.

8 **MR. SMITH (by Telephone):** Okay, I'll be
9 here if you need to ask me any questions.
10 I'll be more than glad to give you the benefit
11 of what I've experienced.

12 **MR. PRESLEY:** Thank you, sir.

13 **COMMENT 21: EXTREMITY DOSIMETRY**

14 Let's start again with the matrix. We
15 left off at 21. Twenty-one has to do with
16 extremity monitoring. Data appears to exist
17 from '69 onward. There were only rare
18 instances of monitoring prior to that time.
19 The response on this is -- Arjun, do you want
20 to --

21 **DR. MAKHIJANI:** I think from 1967 onward it
22 doesn't seem to be an issue. This was an
23 issue before 1967, and I don't think, well,
24 the status that we concluded from the TBD
25 review was extremity monitoring data appeared

1 to be in use from 1967 onward. There were
2 only rare instances of monitoring prior to
3 that time. NIOSH has not proposed a dose
4 reconstruction method to deal with this issue
5 for the pre-1967 period.

6 So we didn't see anything new in the
7 TBD for the pre-1967 period.

8 **MR. ROLFES:** Those people that were doing
9 hands-on work with radioactive components such
10 as people that were handling core samples or
11 people that were doing the device assembly
12 would have been the ones with the highest
13 potential for exposure to their extremities.
14 In looking through NOCTS we looked through
15 device assembly workers at Nevada Test Site,
16 and neither of those two individuals we
17 located had skin cancers of the extremities
18 making the need for those two individuals
19 moot. We didn't need to do an extremity dose
20 reconstruction of these two cases.

21 **DR. MAKHIJANI:** Were there data in your
22 files for extremity monitoring?

23 **MR. ROLFES:** We wouldn't need the extremity
24 monitoring data if we didn't have a cancer to
25 reconstruct on the extremity though.

1 **DR. MAKHIJANI:** No, no, I mean that's, the
2 cancer --

3 **MR. ROLFES:** But as ^ I didn't look, sir.

4 **MR. PRESLEY:** Okay, the action on this is
5 the evaluation of extremity dose for skin
6 cancer is discussed in OTIB-0017. Has this
7 been reviewed?

8 **DR. MAKHIJANI:** I'm not with you on that
9 one.

10 **DR. ROESSLER:** Arjun, he's using the --

11 **DR. WADE:** Response 21.

12 **MR. PRESLEY:** On page 12, I'm sorry, page
13 13.

14 **DR. MAKHIJANI:** Does OTIB-0017 discuss how
15 to evaluate it in the absence of any data or,
16 I'm not familiar with OTIB-0017.

17 John, are you familiar with OTIB-0017?

18 (no response)

19 **MR. ROLFES:** Gene Rollins, could we have you
20 explain what we have incorporated into the
21 matrix here? We put a statement in the matrix
22 that says evaluation of extremity skin dose is
23 discussed in OTIB-0017. Could you please
24 elaborate on that?

25 **MR. ROLLINS (by Telephone):** I'm not sure

1 that I can. Where are you reading this from?

2 **MR. ROLFES:** We're back onto the full matrix
3 on page 13 of 14 under response number 21.
4 We've got a statement in there regarding the
5 evaluation of extremity dose for skin cancer
6 which is discussed in TIB-0017. And then we
7 also have a statement that says the ORAU team
8 Technical Basis external one, Section 6.4.2.6,
9 page 51, as well as Section 6.5.2 on page 59,
10 have discussion of this.

11 **MR. ROLLINS (by Telephone):** I'm not sure
12 why the reference to OTIB-0017 would be
13 applicable. That's how we determine shallow
14 dose, and I don't know how. I don't know why
15 that was put into the matrix.

16 **MS. MUNN:** Well, and in any case, this item
17 is really complete.

18 **MR. PRESLEY:** Yes.

19 **MS. MUNN:** We have indicated that it was
20 done. That was just additional information I
21 think.

22 **MR. ELLIOTT:** Well, we need to look and see
23 if this comment we put in here is appropriate
24 for this response or not. And if it's not, we
25 should sure seek its deletion. If it is, we

1 should explain why we think it is.

2 **MR. ROLFES:** It may just be that additional
3 details on the interpretation of dosimetry
4 records for assigning shallow dose is
5 discussed in this TIB.

6 **DR. ROESSLER:** On the shorter matrix there's
7 more information. It refers to the interview
8 with Bruce Church.

9 **MR. ROLFES:** Yes, we did specifically ask
10 Bruce about -- let me take a look and see
11 where we -- I specifically asked him what do
12 you recall regarding neutron on extremity
13 dosimetry for assembly workers, weapons
14 developers and scientists tracking specific
15 programs. He indicated that they did
16 extremity and neutron dosimetry at NTS and at
17 the labs. There was a potential for neutron
18 dose for weapon developers. Extremity
19 dosimetry was used as needed. Not a lot of
20 people required neutron monitoring. And the
21 facility workers also, in fact, had extremity
22 monitoring. Let's see, the number of people
23 that would have been involved in the final
24 assembly of a weapon, for a device to be
25 tested was very, very few.

1 **MR. RICH:** This was Security control.

2 **MR. PRESLEY:** Yes. Well, it was also
3 controlled by the --

4 **MR. ELLIOTT:** Probably enough said.

5 **MR. PRESLEY:** Okay, the response to that is
6 HHS is going to look at OTIB-0017 and see what
7 the, why it was in there. If it wasn't, then
8 we will take it out. And I see absolutely no
9 response from the Board. This will be gone
10 over when we do the complete review for
11 completeness. Anybody have anything?

12 **DR. ROESSLER:** What about SC&A? Is there
13 anything left hanging on this one?

14 **DR. MAKHIJANI:** No, I think we've made our
15 comment. I mean, the data before 1967 don't
16 seem to exist, and the statement is that there
17 were few workers. So I mean, I don't know
18 what more, I would agree that there's no --

19 **MR. RICH:** Could I say just one more thing.
20 That the lack of obvious workers could very
21 well be because the assembly were done by
22 laboratory people. It was not by contract
23 people. And these people, at Los Alamos for
24 example, were controlled separately and the
25 records are separate. And so as a consequence

1 that probably accounts for the fact that...

2 **MS. MUNN:** Not any NTS workers.

3 **MR. ELLIOTT:** But let me just play that out
4 a little bit, Bryce. Are you, in your
5 statement is it an implication that a person
6 from Los Alamos who was sent down in final
7 assembly would have worn a neutron badge or
8 would have been monitored for neutrons in a
9 way?

10 **MR. RICH:** No, no, I can only speak for
11 Livermore because that was my responsibility.
12 And we wore an NTS badge.

13 **MR. ELLIOTT:** You wore an NTS badge so you
14 wouldn't have had your neutron dose monitored
15 either.

16 **MR. RICH:** Except that it was monitored ^
17 survey instrumentation ^.

18 **DR. MAKHIJANI:** Are we on 21 or 22?

19 **DR. ROESSLER:** Yeah, are we talking about a
20 neutron dose or --

21 **MR. PRESLEY:** Twenty-one, we're talking
22 about 21.

23 **DR. ROESSLER:** I thought it was skin --

24 **MR. ROLFES:** That was related to extremity
25 monitoring more so than neutron dose, but --

1 **MR. ELLIOTT:** I'm sorry, I thought you were
2 on 22.

3 **MR. PRESLEY:** We're not there yet.

4 Anybody have any problems with 21
5 then?

6 (no response)

7 **COMMENT 22: NO NEUTRON DOSE DATA UNTIL 1966**

8 **MR. PRESLEY:** We'll move on. Okay, go back
9 to the six-page document, the Comment 22 is
10 ORAUT 2007 has not provided an accurate
11 scientific basis for the use of n-over-p ratio
12 of 2.5 unmonitored assembly and TRU waste
13 workers. The recommended use of the ratio
14 from Pantex does not have an adequate
15 scientific foundation. The neutron exposure
16 issue for both these groups of workers is
17 still outstanding for all cases when they were
18 unmonitored. Response: That the supplemental
19 justification for 2.5 instead of 1.7 in the
20 Pantex TBD is in process.

21 Arjun, do you want to address this
22 just a minute?

23 **DR. MAKHIJANI:** Yeah, I can go through this
24 in the various parts. One is that we didn't
25 review the calculations in detail about Test

1 Site workers in terms of the doses at six
2 kilometers, but the approach looked
3 reasonable, and we agree with the general.
4 There's not an outstanding issue there
5 anymore.

6 The only note that we made was that
7 site expert interviews, as the same expert as
8 I interviewed for the site profile review,
9 indicated that the NTS personnel were present
10 in the forward areas with the military
11 personnel, some of them. But I think you
12 have, in any case, you have the ^ of neutron
13 dose closer than six kilometers, but just
14 raising that in a question since it was stated
15 that it would generally not be present.
16 There's no particular action or follow up
17 there because, as I remember, you have doses
18 closer than six kilometers calculated also.

19 In regard to the neutron areas that
20 were mentioned, the revision of the site
21 profile suggested an n/p ratio of 2.5 for
22 assembly workers. Basically, it was Pantex
23 ratios, 2.5 and 1.7, for assembly and
24 transuranic waste workers. Recently, SC&A has
25 sent to the Board our Pantex site profile

1 review. I was not involved in that. I just
2 looked at what we had said for the
3 neutron/photon ratio as they apply to Pantex.

4 And as noted here our team had said
5 that the ratio chosen, whether it was 1.7 or
6 2.5, was claimant favorable in many cases but
7 that was not claimant favorable in other
8 cases. And even 2.5 would not be claimant
9 favorable in some cases for Pantex itself.

10 And transferring Pantex data with
11 different physical configurations, different
12 buildings, different arrangements, different
13 devices, and in Pantex it was the
14 neutron/photon ratio was found to be device
15 dependent. So it didn't seem appropriate to
16 do that because it varies a great deal
17 according to device and time. And so we did
18 not agree with the use of a constant
19 neutron/photon ratio or with the transfer of
20 Pantex data to NTS.

21 Then there was the question of neutron
22 sources. And there's a nominal ratio of five
23 that has been suggested, but the references
24 are not specific to NTS so far as I could
25 determine. Is that correct?

1 **MR. ROLFES:** As far as neutron sources I
2 would have to ask Gene Rollins.

3 **DR. MAKHIJANI:** So far as I could determine,
4 there were not.

5 **MR. ROLFES:** Okay, Gene, did you hear the
6 question?

7 **MR. ROLLINS (by Telephone):** Yes, they
8 probably would not be. But these would in all
9 likelihood be not untypical from commercially
10 available well logging sources.

11 **DR. MAKHIJANI:** Now the neutron-to-photon
12 ratios cited there as being greater than five
13 to as high as 29. And but we don't know why a
14 single ratio of five --

15 **MR. ROLFES:** What was the single ratio
16 chosen?

17 **DR. MAKHIJANI:** Yeah, basically we felt that
18 the ORAU team and NIOSH did not adequately
19 justify the use of a single ratio of neutron
20 sources and also they were generic numbers and
21 not site specific. And you know you're a
22 little bit uncomfortable with the use of a
23 non-site specific neutron/photon ratio.

24 **MR. ROLFES:** Well, as we've indicated there
25 is supplemental justifications for putting

1 something in writing for neutron-to-photon
2 ratios for information regarding neutron
3 surveys.

4 **DR. MAKHIJANI:** Subsequent to our sending
5 you the ^?

6 **MR. ROLFES:** Yeah, we are providing, we are
7 in process of providing supplemental
8 justifications.

9 **MR. PRESLEY:** In other words what we need to
10 do is make sure that this TIB 8-6, ^ as
11 Attachment D, 117 through 121, are those the
12 pages that we need to look through. Is that
13 what we need to ^?

14 **MR. ROLFES:** Gene, could you or is there
15 anything that Richard ^ has provided that
16 would help to better address the question? We
17 are actively working on putting some
18 supplemental responses and supplemental
19 information together. Is that correct?

20 **MR. ROLLINS (by Telephone):** He basically
21 reiterated that the only way that we could get
22 our arms around this would be to go into the
23 site records and site procedures to see what
24 work had been done as far as characterizing
25 the neutron fluxes around these types of

1 devices and to look at actual monitoring data
2 to see if we can determine what the photon-to-
3 neutron ration may have been for these people
4 that handled these devices.

5 **MR. PRESLEY:** So we owe this information
6 then to SC&A to evaluate for completeness
7 after you all get through with it.

8 Yes, Wanda?

9 **MS. MUNN:** The supplement's coming.

10 **MR. PRESLEY:** Yes. Can we do that?

11 **MS. MUNN:** Sounds reasonable.

12 **MR. PRESLEY:** Okay.

13 **MR. CHEW:** I do have a question, Bob.

14 **MR. PRESLEY:** Yes, sir.

15 **MR. CHEW:** What do they mean by devices?
16 Are you talking about neutron sources? Are
17 you talking about ^? Are you talking about
18 device assemblies? What's the difference?

19 **MR. PRESLEY:** Well, you're talking about
20 your neutron sources, aren't you?

21 **DR. MAKHIJANI:** Well, there were both.
22 There were the actual devices, and then there
23 were neutron sources in a separate section
24 with different neutron-to-photon ratios,
25 right, Mark?

1 **MR. ROLFES:** I'm sorry, would you repeat
2 that, please?

3 **DR. MAKHIJANI:** The question was, are we
4 talking about neutron sources or devices. And
5 my response was that there are separate
6 sections for both, and we responded to both.

7 **MR. ROLFES:** So you're questioning if we can
8 provide something?

9 **DR. MAKHIJANI:** No, it was just a question
10 about what we were doing.

11 **MR. CLAWSON:** What neutron sources?

12 **MR. ROLFES:** Well, it does mention here
13 though, it mentions here for unmonitored
14 assembly workers as well as TRU waste workers.
15 So it's two separate source terms that we're
16 referring to.

17 **MR. ELLIOTT:** The assembly would be the
18 device.

19 **MR. CHEW:** Let's talk about devices, okay?
20 As Bryce was saying, when we're talking about
21 an actual device assembly for a test -- let's
22 focus on that, not sources. Those were all
23 done by laboratory personnel and not NTS
24 personnel. And I think, Bob, you know that.

25 **MR. PRESLEY:** Right.

1 **MR. CHEW:** They were not even allowed in the
2 area until we had it all buttoned up, and then
3 they were able to take it out of the building,
4 5310, and transport. They did that for them,
5 right?

6 **MR. RICH:** ^

7 **MR. CHEW:** And even transport, that's right,
8 because they had a caravan out to the forward
9 area. They all ^ out to the red ^. I
10 remember those days very well.

11 Secondly, what you're talking about,
12 Arjun, is neutron sources recognizing that
13 there are probably neutron sources ^ as
14 logging, probably plutonium-building neutron
15 sources for calibration of NTA film. That's
16 probably where you would come up with neutron
17 sources. Or neutron sources that they used to
18 making sure the detectors that was part of the
19 test operation was working.

20 Because what you're really looking for
21 during tests is a source of neutrons very
22 quickly and very fast. But so they did use
23 those kind of neutron sources. Those were
24 also handled by scientific and laboratory
25 personnel. And so to answer your question

1 you're going to see a tremendous range
2 especially in the area come back to where
3 you're putting a device of working together
4 those neutron ratios are going to be
5 considerable smaller, especially as soon as
6 you make it into an assembly as you well know.
7 You know, you put things around it.

8 Where the neutron sources you're
9 talking about why you saw a high ratio is that
10 when you have a bare neutron source,
11 plutonium, beryllium or polonium, you're going
12 to see 30-to-40 times the amount of neutrons
13 for the gamma because it is a source of
14 neutrons. So we've got ^ in order to answer
15 your question ^ exactly what you are really
16 trying to answer here.

17 **MR. PRESLEY:** That's why I assumed sources.

18 **MR. CHEW:** So I'll give you any number you
19 want, any ratio you want.

20 **DR. MAKHIJANI:** Our review was pretty clear
21 about this. We reviewed it in separate
22 sections and if you look at the Pantex site
23 profile review, you'll see that our comments
24 there -- which I didn't independently do that.
25 I just assumed that our review, I accepted our

1 review at face value of that -- is that it was
2 very device-dependent as you say. And in some
3 cases this factor of 1.7 or 2.5 was perfectly
4 good and in other cases was not, and was
5 dependent on what they were assembling, and
6 probably how long it took and so on. And we
7 made our comment about the sources quite
8 separately from that understanding that
9 sources will have higher ratios.

10 **MR. CHEW:** But which one do you want us to
11 focus on?

12 **DR. MAKHIJANI:** We have comments on both of
13 them, and if there are lab workers that are
14 not concerned with NTS, that was a separate
15 issue that we raised earlier, can we kind of
16 bracket if these were not workers that we
17 should worry about for NTS. And then that
18 discussion would stop in this context, and
19 that would be fine.

20 **MS. MUNN:** One of my questions was
21 unmonitored assembly --

22 **DR. MAKHIJANI:** There was no monitoring
23 before '66.

24 **MS. MUNN:** -- and TRU waste workers --

25 **MS. MUNN:** There was no neutron monitoring

1 before '66 at NTS.

2 **MR. CHEW:** Well, let's define what you just
3 said. You're saying that people at Nevada
4 Test Site did not wear like an NTA film,
5 right? That's different than, there was
6 neutron monitoring because I remember for a
7 fact that when we were putting assemblies
8 together, and Bryce would know that because I
9 used some of his personnel to come up and
10 measure the neutron ^ as we were putting the
11 units together.

12 **MR. RICH:** Right, right.

13 **MR. CHEW:** So that's neutron monitoring.

14 **DR. MAKHIJANI:** No personnel involved in
15 neutron monitoring before '66, and in the
16 original review we had grave, if I remember
17 right, the question of where do these workers
18 belong and should we be talking about them
19 here or there or their records may be in both
20 places. So that may be the bigger issue of
21 unclarity. Maybe that's resolved. I don't
22 know.

23 **MR. CHEW:** Because if they are really
24 technical people from the scientific
25 laboratories there at DOE, they're really not

1 part of this NTS discussion. Is that correct?

2 **MR. ELLIOTT:** I'm not so sure. Because when
3 we do a dose reconstruction for a claimant, we
4 call for DOE to provide us dose information
5 for all sites that person worked at. And so
6 when they produce it, let's say it's a
7 Livermore chap who went to Nevada Test Site in
8 Device Assembly Operations, then his badge
9 would have been issued by NTS for the days he
10 was there.

11 And we would get that dose result back
12 for the dose reconstructor to account for it.
13 If that badge did not have NTA -- not an NTA -
14 - or didn't have a neutron component, then
15 that's what we're missing for that particular
16 individual's experience at Nevada Test Site.
17 Under the Test Site site profile, I think it's
18 inclusive here.

19 **MR. CHEW:** Well, what would you say
20 described this ^ exactly what happened?

21 **MR. ELLIOTT:** So it begs the question what
22 are we doing about neutron exposures for
23 people who were at the Test Site either as a
24 lab person for a short time period doing what
25 they were doing or as a Nevada Test Site

1 employee, contractor, subcontractor, doing
2 whatever they were doing. Is that --

3 **DR. MAKHIJANI:** Yeah, that clarifies it more
4 than it's ever been clear for me.

5 **MR. ELLIOTT:** Well, I finally got something
6 right. That's enough, Larry, shut up.

7 **MR. PRESLEY:** What we need to do, I guess,
8 is task CDC with coming up with, I don't want
9 to say a procedure or a white paper or
10 whatever they want to do about what they've
11 been able to find out or how to monitor these
12 workers.

13 **MR. ELLIOTT:** How about assign neutron dose?

14 **MR. PRESLEY:** Up to 1966, is that correct?

15 **DR. MAKHIJANI:** I think the issue's only up
16 to 1966.

17 **MR. ELLIOTT:** So we've really got three
18 scenarios. You've got a lab worker who comes
19 in, short duration, does what they do. You've
20 got an onsite worker who's there doing
21 whatever they normally do. And then you've
22 got this other scenario situation where the
23 exposure really is driving the thing here, and
24 it's either to a source or it's working on a
25 device.

1 **DR. MAKHIJANI:** Right. Let me clarify that
2 actually. It says partial data through '79,
3 and I don't know that we've ever addressed
4 that question. Maybe you have a coworker
5 model or something. Do you have a coworker
6 model for neutron or partial data? I mean,
7 the people who were monitored were the ones at
8 risk of exposure. I'm not sure that we ever
9 cleared that up.

10 **MR. ROLFES:** I can tell you what we do have
11 in our review of the 200 claim files that we
12 completed. I did allude to the neutron dose.
13 I did ask Mel to pull up the Microsoft Word
14 document that I did before regarding the 200
15 case dosimetry files that we reviewed.

16 We reviewed 200 claim external
17 dosimetry files to examine them for positive
18 neutron beta and gamma results. Of the 200
19 claimant files reviewed, only one positive
20 neutron result for one individual was located.

21 And do you recall what area this
22 building was in or what that building might
23 have been?

24 **MR. ELLIOTT:** In what timeframe?

25 **MR. ROLFES:** This was in the more recent

1 time period. This was from -- let's see, once
2 again I'd have to clarify this with the person
3 that did the review, and I think we're going
4 to prepare something from our review for SC&A
5 to look at. So we can incorporate discussion
6 of this review in the document that we give to
7 SC&A.

8 **MR. PRESLEY:** You're going to provide SC&A
9 something on the neutron dose capture?

10 **MR. ROLFES:** We will provide --

11 **MR. PRESLEY:** Is that a good word?

12 **MR. ROLFES:** We will provide information
13 regarding neutron doses as well as some
14 discussion of the partial data up to 1979 I
15 guess is what the question is.

16 Gene, do you have anything to add
17 about the partial data up to 1979 for neutron
18 dose?

19 **MR. ROLLINS (by Telephone):** No, I haven't
20 seen that yet, Mark.

21 **MR. CLAWSON:** There was one other comment to
22 come up and Larry did it so good, if I
23 remember right at the very beginning of this
24 one of our questions for the earlier years was
25 how the badges went back and forth. We're all

1 under the impression that when Livermore came
2 out, they used NTS or Nevada Test Site badges
3 and so forth. And I thought that we had
4 checked into that, and we had clarified that
5 that was so, and that they showed results for
6 us. I just --

7 **MR. ELLIOTT:** Yeah, we're getting that all
8 the time.

9 **MR. CLAWSON:** Yeah, and I just wanted to
10 make sure. I know there was a question of
11 that and when they brought that up --

12 **MR. PRESLEY:** It wasn't just Los Alamos. I
13 mean, they were, it was everybody.

14 **MR. CLAWSON:** I realize that, and I just --

15 **MR. PRESLEY:** You turned your badge in, and
16 they put it on the wall. The badge you wore
17 in there from wherever you were from hung on
18 the wall. You picked up your NTS picture
19 badge, and that's what you wore.

20 **MR. CLAWSON:** And I realize this is what
21 this came from was from some of the claimants
22 of how and where they filed for, if they had
23 to file an NTS for this or if they have to, if
24 they were filing like Lawrence Livermore or
25 anything else like this. And this is just

1 why, for --

2 **MR. RICH:** And it gets just a little bit
3 more complicated than that so I might as well
4 throw it out there anyway. Lawrence Livermore
5 Laboratory had a residence site, a resident
6 group that oversaw the support and the testing
7 of devices onsite. In addition, the resident
8 Livermore people came out frequently and there
9 was that group and they were monitored, both
10 at Livermore and at NTS. And so in addition
11 to the support team that was the resident
12 contract people and other contract people,
13 like EG&G and others.

14 **MR. PRESLEY:** And that's one reason we're
15 working on this 180 day thing, I mean this 80
16 day thing or whatever it is with trying to
17 work on the 250 day deciding what the date's
18 going to be because of the people that worked
19 out there full time.

20 **MR. ELLIOTT:** And we know that Labor does
21 treat it as 86 days.

22 **MR. PRESLEY:** Is it 86?

23 **MR. ELLIOTT:** Eighty-six. Labor has a
24 Technical Bulletin out, and if you were
25 stationed there, living there, then you don't

1 have to stay there 250 days. It's somewhere
2 on the order of 83 or 83 days.

3 **MR. PRESLEY:** Okay.

4 **MR. CHEW:** I just wanted, Arjun, I just
5 wanted to discuss with you about the
6 neutron/photon ratio. I want to be careful
7 what we say, okay? Remember the data you're
8 talking about from Pantex only happens under a
9 certain situation, and immediately it very
10 much changes, very quickly, as you well know
11 as you're doing an assembly.

12 Because I just now recall, because I
13 just realized I'm in an SEC class already. I
14 guess it was based on the time. So what you
15 would do is take my badge from Nevada Test
16 Site and look at the number of photons that
17 are on there and then add a neutron component.
18 Is that what you're suggesting here?

19 **DR. MAKHIJANI:** That's what suggested in the

20 --

21 **MR. CHEW:** Yeah, but that only happened to
22 me while I was only assembling the unit for a
23 very sort time, and the majority of the photon
24 I had gotten was probably on recovery. You
25 see what I'm saying?

1 **MR. RICH:** It's ^.

2 **MR. CHEW:** Yeah, it's a way ^. That's where
3 I'm coming from. The amount of neutrons I got
4 was so small, I don't care what the ratio was
5 ^. I mean, I do, but for ^. I just want to
6 make sure we focus. We were not constantly
7 exposed to neutron and photons at the same
8 time.

9 **MR. ROLFES:** Certainly there's a limited
10 number of assemblies associated with a limited
11 number of tests. I think it's only during
12 those tests -- excuse me. It's only during
13 those assemblies that a person would have a
14 significant risk for neutron exposures. The
15 other exposures that a person would be
16 receiving would be to, as Mel indicated, the
17 other high exposure scenarios would be during
18 re-entries or during some discrete incident or
19 accident involving fission products, you know,
20 exposure to fission products.

21 So if we were applying a neutron-to-
22 photon ratio based on recorded gamma doses for
23 a person's entire work history, the neutron
24 doses that we would be assigning would be a
25 significant overestimate. And that's

1 typically what we do in a dose reconstruction.

2 **DR. MAKHIJANI:** Yeah, that could be. I
3 think that's a different argument than the one
4 that was made.

5 **MR. CHEW:** Well, that's reality.

6 **DR. MAKHIJANI:** What was in the TBD was you
7 have a job twice for whom you're trying to
8 calculate. You're trying to calculate a dose
9 for a job type rather than a person because
10 the TBD is generic in that sense, and you're
11 shifting a neutron-to-photon ratio from Pantex
12 to Nevada Test Site. And the comments that we
13 made are in that context. I think when you
14 put it in a broader context I think we're
15 certainly open to the case that, especially in
16 Nevada Test Site I would be, that for most of
17 the work you've got photon exposures. You do
18 into the tunnels or, you know, you go to
19 recovery and so on. There are no neutrons
20 there, but you have photons and beta.

21 **MR. CHEW:** Where I'm going with this I don't
22 think the Pantex data really applies. That's
23 where I'm going.

24 **DR. MAKHIJANI:** Well, that's what we're
25 saying.

1 **MR. ROLFES:** It results in a claimant
2 favorable dose estimate is what the Pantex
3 data does for the NTS workers involved in this
4 process.

5 **COMMENT 23: SOIL DATA FOR RESUSPENSION DOSES**

6 **MR. PRESLEY:** All right, moving right along.
7 The next response is if you would go to the
8 full response matrix and has to do with item
9 23, page 13 of 14, adequacy of soil data. And
10 that has been addressed in Response 5, and as
11 I see it should be complete. Okay?

12 Twenty-four -- anybody have any
13 questions?

14 **DR. MAURO (by Telephone):** Yeah, this is
15 John Mauro. On number 23 I believe that's
16 part of the new white paper that Gene Rollins
17 will be sending to us. I just want to make
18 sure that that's correct interpretation.

19 **MR. ROLLINS (by Telephone):** That's correct,
20 John.

21 **MR. ROLFES:** I think we also skipped over
22 something that I wanted to make sure
23 everybody's aware of. In these Rad paper
24 reports associated with the Nuclear Reactor
25 Development Station we do, in fact, have

1 integral gamma and neutron data at various
2 distances associated with the reactor test.

3 This one is specifically for the Kiwi
4 TNT test, and I think it's of interest to note
5 that the gamma doses at all distances from the
6 reactors are about 50 times higher, the dose
7 rates are about 50 times higher than are the
8 neutron doses. So I don't know if anybody'd
9 like to see this right now or not, but so
10 essentially and additionally, there's
11 documentation in the Rad Safe reports giving
12 the maximum recorded exposures for different
13 tests, and also indication about the neutron
14 doses.

15 I haven't seen any indication of
16 positive reported neutron doses for the number
17 of records that I have reviewed from the NRDS.
18 So essentially if we have neutron and gamma
19 dose rate surveys around these reactors, then
20 we know the people that are involved and know
21 the maximum gamma dose that personnel
22 received, we can do a neutron dose
23 calculation.

24 So anyway, we do that the data here
25 for those limited number of individuals that

1 were involved in the testing of the reactors.

2 **MS. MUNN:** Good.

3 **COMMENT 24: HIGH-FIRED OXIDES**

4 **MR. PRESLEY:** On 24, it has to do with the
5 presence of high-fired oxides resulting from
6 the atmospheric weapons testing and the
7 reactor testing, needs to be investigated. I
8 have that marked as complete, review for
9 completeness. NIOSH has revised the Technical
10 Basis Document, Table 5D-24 to include a range
11 of solubilities for most radionuclides of
12 concern. And let's see, currently at OCAS.
13 Is this something then that we need to, this
14 thing gets reviewed? Make sure that SC&A gets
15 page 51 of this to go over?

16 **MS. MUNN:** Yeah, probably so. We've pretty
17 much put that to bed. I think it's more a
18 question of verifying this document is
19 appropriate, complete.

20 **DR. MAKHIJANI:** But for atmospheric testing
21 it's a moot question.

22 **MR. PRESLEY:** Right, it's a moot question.

23 **DR. MAKHIJANI:** But for the rest of it,
24 yeah, we could do that.

25 **MR. PRESLEY:** We talked about the --

1 **DR. NETON:** This action on NIOSH's part I
2 think is done. TIB-0049 has already been
3 issued.

4 **DR. MAKHIJANI:** Yeah, we've already reviewed
5 --

6 **DR. NETON:** TIB-0049 is --

7 **DR. MAKHIJANI:** We've already reviewed TIB-
8 0049.

9 **MR. PRESLEY:** Then can we mark this
10 complete, no action necessary?

11 **DR. MAKHIJANI:** Are you reading from your
12 most recent one? No, it's not there. Where
13 are you reading TIB-0049?

14 **DR. ROESSLER:** Page 14 of the --

15 **DR. NETON:** It just says the action is NIOSH
16 to develop a Super-S TIB guidance.

17 **DR. MAKHIJANI:** And that's been done.

18 **MR. RICH:** Yes, that's been done awhile ago.

19 **MS. MUNN:** And that's why I said it's
20 primarily --

21 **DR. MAKHIJANI:** And, and we signed off on
22 it.

23 **MS. MUNN:** It's just a matter of looking at
24 it to see that its --

25 **MR. PRESLEY:** Then Response 23 is complete

1 with no action.

2 **DR. NETON:** I think the key in 24 was to say
3 that Super-S exists at NTS. We agree with
4 that, and OTIB-0049.

5 **MS. MUNN:** Let's look at the revised
6 section.

7 **MR. PRESLEY:** Okay, 25 --

8 **DR. MAKHIJANI:** No action or look at that
9 one page. I don't know. I've heard two
10 different things from two Board members.

11 **MR. PRESLEY:** Do we want them to look at
12 that one page when that is done? I thought it
13 was done.

14 **MS. MUNN:** Well, just to verify that it's
15 appropriately incorporated in this particular
16 document. The issue itself is put to bed.

17 **MR. PRESLEY:** Mark, can you make sure that
18 that gets sent to SC&A?

19 **MR. ROLFES:** Sure.

20 **COMMENT 25: SITE EXPERT INTERVIEWS**

21 **MR. PRESLEY:** Okay, this is the one we've
22 been looking for. NIOSH documentation of site
23 expert interviews is inaccurate --

24 **MR. ELLIOTT:** You mean inadequate.

25 **MR. PRESLEY:** -- inadequate -- I'm sorry,

1 sir. This has been beaten around for the last
2 six months. Mark has gotten all of the
3 paperwork as I understand it to ^ and may have
4 gone over this. I believe we have a statement
5 back from you all that you don't have a
6 problem with this anymore.

7 **DR. MAKHIJANI:** Well, you know, we affirm it
8 was inadequate, and NIOSH produced all the
9 documentation, and we had some exchange of
10 paper. There's nothing further to do on that.
11 NIOSH now has a more formalized procedure for
12 documenting these worker interviews and ^
13 database, and we're aware of it. We were
14 recently trained^ to look at it. So I think
15 in this context it's now a moot question. For
16 NTS it's closed I would say.

17 **MR. ROLFES:** We also note I do want to
18 indicate that we conducted additional
19 interviews. There are a couple of other
20 individuals that are not named here, but, you
21 know, to be added.

22 **MS. MUNN:** It might be good for completeness
23 to do that.

24 **MR. ROLFES:** I'm sorry, Wanda?

25 **MS. MUNN:** It might be good for completeness

1 to do that.

2 **MR. ROLFES:** We certainly will, we did put
3 one individual's name in there, but there's a
4 couple of more, at least that I could think
5 of, that we could add to it.

6 **ACTION ITEMS**

7 **MR. PRESLEY:** Before we get into these other
8 comments, I'd like to go over the action items
9 and get that done for the site profile, and
10 then we can go into these action items. On
11 action item Response 1, I have nothing on that
12 one --

13 **MS. MUNN:** No.

14 **MR. PRESLEY:** -- whatsoever.

15 Two, Mark is to write a white paper to
16 SC&A on the Response 5, 6 and 7.

17 Number three, Mark to provide pages 79
18 through 83 on the new site that was on --
19 can't read my own writing here -- site
20 description. That's what it is. When the new
21 site description gets completed, you're to
22 provide page 79 through 83 to SC&A. Also
23 provide Table C-1-dash-C-2 and C-3.

24 **MR. ROLFES:** The site description is
25 available so --

1 **MR. PRESLEY:** Yeah, and that's -- Arjun,
2 you're --

3 **DR. MAKHIJANI:** We have that.

4 **MR. PRESLEY:** You have that and ready to go
5 on that.

6 Comment 4, I've got that you need to
7 look at pages 135 and 136 -- I'm sorry, pages
8 35 and 36 and page 101 and 102.

9 **DR. MAKHIJANI:** I'm sorry. I don't have, on
10 four I just have an item to send a correction
11 on the oro-nasal breathing. That's all I
12 have.

13 **MS. MUNN:** And I had a note that new reports
14 were going to be reviewed and OCAS' response
15 is going to be expanded.

16 **MR. ROLFES:** Yeah, we'll take a look at the
17 Nuclear Reactor Development Station particle
18 issue and prepare something to expand our
19 discussion on the potential for ingestion of
20 hot particles.

21 **MR. CLAWSON:** Well, that's really, if I
22 remember right, this, this really wasn't an
23 oro-nasal issue. It was more of a large
24 particle ingestion.

25 **DR. MAKHIJANI:** Right, that's the correction

1 that I needed. Other than that was there an
2 action item for us in terms of reviewing?

3 **MR. ELLIOTT:** Review what we send you.

4 **DR. MAKHIJANI:** Like the Rad Safe reports or
5 something? I'm not clear. I didn't have
6 anything written down.

7 **MS. MUNN:** That's because we didn't give you
8 any. I don't believe so. My notes didn't
9 show anything. They just showed that Mark was
10 going to expand the level based on the review.

11 **MR. CLAWSON:** I thought SC&A was going to
12 review it.

13 **MS. MUNN:** Well, this is, the oro-nasal
14 breathing thing is gone completely. That's
15 not there. We've reworded the comment, and
16 because we reworded the comment and because
17 it's response is adequate but needs to be
18 expanded because of the new material, there
19 really isn't any issue, I think, with SC&A
20 because it's done.

21 **MR. PRESLEY:** Well, I've got down apparently
22 that 135, 136 is a note that I put in there
23 for something else. It says Mark is to revise
24 the content or the comment on hot particles,
25 and we're going to change the title of this

1 thing to --

2 **DR. MAKHIJANI:** Actually then if the words
3 due to oro-nasal breathing can be deleted, I
4 think Jim suggested that earlier. If we could
5 just all delete, then this action will be
6 done.

7 **MR. PRESLEY:** Right, and then I have I
8 marked it complete.

9 Five then is two pages.

10 **MR. ROLFES:** We received some comments from
11 SC&A on Gene Rollins' ambient environmental
12 intake model, and we were going to wait to get
13 that to SC&A in an approved-type profile
14 document. However, we're going to address
15 their comments in a new white paper revision,
16 so that is our action item to get to.

17 **MR. PRESLEY:** Item six then.

18 **MR. ROLFES:** Same thing.

19 **MR. PRESLEY:** Same thing, and it's the same
20 thing with seven, white paper.

21 Eight is complete.

22 Nine is also complete.

23 Ten --

24 **MR. ROLFES:** I don't have any action items
25 written down on this.

1 **MR. PRESLEY:** Yeah, I've got ten marked
2 complete.

3 **DR. MAKHIJANI:** Ten I have written down that
4 you asked us to review the page changes.

5 **DR. ROESSLER:** Yeah, page 42 is what I
6 circled here.

7 **MR. PRESLEY:** Page 42? Okay.

8 Page 11 or Response 11, we're going to
9 send page 77 and 78 on the site description,
10 and you should have that.

11 **DR. MAKHIJANI:** We have that.

12 **MR. PRESLEY:** You're got that.

13 **MR. ROLFES:** They're going to take a look
14 at, and I guess the tables that I mentioned,
15 C-1, C-2 and C-3 which are the job matrices
16 that give indicators of potential for
17 exposure.

18 **DR. MAKHIJANI:** And we're also to look at
19 those environmental dose pages that we didn't
20 look at before.

21 **MR. ROLFES:** These are in the external dose
22 portion of the TBD.

23 **DR. MAKHIJANI:** Right.

24 **MR. ROLFES:** So it's pages 35 and 36 as well
25 as 101 and 102.

1 **MR. PRESLEY:** Twelve, I have no comment on.
2 It's complete.

3 Thirteen I show is complete.

4 **DR. ROESSLER:** I show page 41 and page 52
5 are going to SC&A.

6 **MR. ROLFES:** They'll confirm that we put the
7 bounding calculations.

8 **MR. PRESLEY:** Item 14. I don't show any
9 action items whatsoever on that.

10 **DR. ROESSLER:** I show that SC&A is going to
11 look at Section 5.6.3 which starts on page 53.

12 **MR. ROLFES:** And just to confirm that we
13 have methodology to interpret gross fission
14 product for gross alpha bioassay data in a
15 claimant favorable manner.

16 **MR. PRESLEY:** Fifteen, nothing whatever.

17 Sixteen, I've got it marked complete.

18 **DR. MAKHIJANI:** Yes, there's nothing on 16.

19 **MR. PRESLEY:** We marked out on OTIB-0017,
20 the reference to OTIB-0017, and I have that
21 complete.

22 **DR. ROESSLER:** What are you on?

23 **MR. PRESLEY:** Seventeen, we've got response
24 pages on review 49 through 54.

25 **MR. ROLFES:** So SC&A is going to take a look

1 at 49 through 54. Action was?

2 **MR. PRESLEY:** I have 18 marked complete.

3 Nineteen is CDC, HHS, NIOSH and SC&A
4 are going to have a meeting and work this
5 technical call to work this out.

6 **MR. CLAWSON:** Hey, Bob, on 18 back there, I
7 thought there was a page insert in that, and I
8 thought that --

9 **MR. PRESLEY:** There is a page insert in
10 there.

11 **MS. MUNN:** Yeah, page 53.

12 **DR. NETON:** Yeah, that's tied in with 17.

13 **MR. PRESLEY:** They will get 53, 49 through
14 54 in 17.

15 Twenty, NIOSH to look at coworker
16 tables and non-use of badges, and come up with
17 a write up to the Board on your findings on
18 that.

19 **DR. ROESSLER:** Before 1966.

20 **MR. PRESLEY:** Before 1966.

21 **MR. ROLFES:** So just to confirm we are
22 talking from 1951 through 1966. So, it's
23 external dose.

24 **DR. NETON:** Yeah, I thought we were looking
25 at '63 to '66.

1 **MR. ROLFES:** Do we need to clarify that?

2 **MR. PRESLEY:** Well, --

3 **DR. NETON:** Right, but Arjun pointed out we
4 are doing dose reconstructions prior to '63
5 for external so to some extent -- I don't
6 know, I --

7 **MS. MUNN:** I thought the whole object here
8 was to try to --

9 **DR. NETON:** Our only option before '63 is to
10 say we can't do it, and there's no recourse
11 for any of those people. So to some extent
12 those are partial dose reconstructions the
13 best we could do.

14 **MS. MUNN:** 'Sixty-three to '66.

15 **DR. NETON:** Otherwise we --

16 **DR. MAKHIJANI:** John, do you agree with
17 that?

18 **DR. MAURO (by Telephone):** I'm sorry. I was
19 looking at something on my e-mail. Could you
20 please repeat the question?

21 **DR. MAKHIJANI:** All right, I signed off for
22 you. It's okay.

23 **MR. ROLFES:** Never mind.

24 **MR. PRESLEY:** Twenty-one, I have a response
25 that NIOSH will look at and make remarks on

1 OTIB-0017.

2 MS. MUNN: And it may not be necessary
3 there.

4 MR. PRESLEY: Twenty-two --

5 DR. MAKHIJANI: Mr. Presley, sorry, I missed
6 what you said there.

7 MS. MUNN: Response 21, NIOSH is going to
8 check and see whether or not OTIB-0017 really
9 is appropriate.

10 MR. PRESLEY: Twenty-two, NIOSH to get the
11 response to SC&A on neutron dose data up to
12 1979.

13 DR. ROESSLER: How about '66?

14 MR. ELLIOTT: How we assign dose up to '66
15 and then do we have enough neutron dose to use
16 beyond '66 to '79?

17 MR. PRESLEY: That's correct.

18 DR. ROESSLER: Yeah, that was it.

19 DR. MAKHIJANI: These are the 200 claimant
20 files.

21 MR. ROLFES: Yes, the analysis of the 200
22 claimant files, we can take a look at those.

23 MR. PRESLEY: Twenty-four, I have complete,
24 and I also have that you're to send page 51 of
25 the 5.6.1 to SC&A for review.

1 And 25 we've marked complete. That
2 takes care of the matrix. Now, does anybody
3 need to take a short potty break because we've
4 got about 50 minutes here before some of us
5 have to go. We have, SC&A has, they have --
6 Arjun, what do you want to call these?

7 **MISCELLANEOUS ITEMS**

8 **DR. MAKHIJANI:** Well, as I mentioned, we
9 were not doing a complete review, but I had,
10 since it was a complete rewrite, I asked the
11 team that was working on it to read through
12 the whole TBD because how to do a review of
13 something if you don't know where the relevant
14 items are going to be.

15 And so these other items were
16 miscellaneous items that were sent to me by
17 various members of the team. So I collected
18 the relevant ones and suggested, and just
19 included them as comments, not as findings,
20 for NIOSH in case you wanted to do anything
21 with them. I'm not presenting them as
22 findings. It's up to you how you want to deal
23 with them.

24 **MR. ELLIOTT:** Have we studied these at all?

25 **MR. ROLFES:** These other comments, yes. We

1 have, in fact, seen these. These are still on
2 the six-page matrix that we have. We're just
3 in the process, many of these comments were on
4 the external dose TBD that was released
5 shortly before the last meeting, and we just,
6 we're still in the process of actively putting
7 together supplementary information to address
8 these comments. We just had Richard ^ prepare
9 some additional responses, and he's going to
10 be working on some of these I believe.
11 Anyway, if you'd like to go through them, I'd
12 be happy to respond and also to see if we
13 could have Gene, Gene might be able to give
14 some additional details of our path forward to
15 address these other comments.

16 **MR. ELLIOTT:** I just wonder if that's not
17 premature.

18 **DR. MAKHIJANI:** Well, I think they're a
19 matter of record. I mean, we can read them
20 into the record. I don't know what the status
21 of this document is.

22 **DR. NETON:** We're not able to close these
23 out completely in any sense.

24 **DR. MAKHIJANI:** No.

25 **DR. NETON:** ^ passing them out.

1 **MR. ROLFES:** Yeah, we haven't, we're aware
2 of the issues and given the time constraints,
3 we prepared for this meeting in a very short
4 amount of time. I mean, we had about a week
5 to prepare for the meetings.

6 **MR. ELLIOTT:** I think it would be
7 appropriate to read them into the record, and
8 if we have any need of clarification, now is a
9 great opportunity for us to get that. I don't
10 think we're at the point where we're ready to
11 expound upon how we are going to address each
12 or any of them.

13 **DR. WADE:** Remember, SC&A is offering these
14 as comments, not as findings.

15 **DR. MAKHIJANI:** Yeah, and we weren't
16 expecting responses one way or another.

17 **DR. WADE:** So we appreciate it.

18 **MR. ELLIOTT:** Again, this goes to our
19 listing. We list them. We're going to hear,
20 and then we're going to act.

21 **MR. ROLFES:** We can just let Arjun go ahead
22 and read his comments, and we'll provide our -

23 -

24 **MR. PRESLEY:** Arjun, go ahead and let's read
25 your comments, and then, Mark, we'll require

1 or provide a response that they've got. But
2 let's remember, people have to get out of here
3 and there's nothing that we can really do
4 about these today other than read them into
5 the minutes and -

6 **MR. ELLIOTT:** And if we need any
7 clarification we can ask for that?

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

9 **DR. MAKHIJANI:** Okay, let me do this as
10 rapidly as possible.

11 The first comment: Despite the fact
12 that this procedure could overestimate low
13 energy photon dose, this approach to film
14 dosimetry is invalid as a relationship between
15 optical density and exposure is non-linear.
16 That optical density must be converted to
17 exposure prior to performing any subtraction.
18 Thus, an incremental beta dose that is
19 measured by the film emulsion on top of the
20 gamma dose may lead to an underestimate of the
21 beta dose.

22 **MR. ROLFES:** And the NIOSH response is that
23 we're going to review the dosimetry approach.

24 **DR. NETON:** I don't think we're going to get
25 involved in all responses.

1 **MR. ELLIOTT:** Unless we have a
2 clarification.

3 **DR. NETON:** Unless we have a clarification.

4 **DR. MAKHIJANI:** And the second comment was
5 we just pointed out some small errors and
6 editorial issues that need correction.

7 The third -

8 **DR. ROESSLER:** The units might be
9 significant for --

10 **DR. MAKHIJANI:** They are listed in the --

11 **DR. ROESSLER:** You've got them marked --

12 **DR. MAKHIJANI:** We have them marked so they
13 can correct if they agree.

14 Third comment: Table 6-8 is not a
15 complete list of radionuclides released during
16 vents of underground explosions. A more
17 accurate and complete list has been given in
18 Hicks 1981, which is in the list of references
19 of the documents we reviewed.

20 The fourth comment: SC&A's site
21 expert, Lynn Anspaugh, informed SC&A that he
22 has been told that the potential for noble gas
23 exposure during tunnel re-entries was not
24 limited to radiation technicians and miners
25 which is in disagreement with the End Note 22

1 in the site profile on page 61. According to
2 Dr. Anspaugh, re-entries involved electronic
3 technicians and other laboratory personnel as
4 well as supporting crafts persons. Interviews
5 with person who were actually present may help
6 clarify this issue.

7 Fifth comment: The status of the dose
8 reconstruction record of NTS employees who
9 were assigned to the Tonopah Test Range is
10 unclear. ORAU 2007 -- that is that TBD --
11 states that Sandia is, quote, the custodian of
12 TTR dosimetry records.

13 **MR. ELLIOTT:** There should be an end quote
14 there somewhere.

15 **DR. MAKHIJANI:** However, there is no
16 discussion in the TBD of how these records
17 have been integrated into NTS employee records
18 and whether TTR doses are being properly taken
19 into account.

20 And the sixth comment was about
21 National Lab and NTS dosimetry records, and
22 it's a little bit cryptic for me, and I don't
23 know. I'll just leave it at that because
24 that's what's in the matrix. I don't remember
25 what's in the detail. The detail of this may

1 be how they meshed together which maybe Larry
2 addressed earlier.

3 **MR. ROLFES:** I think we spoke to that a
4 little bit already.

5 **DR. MAKHIJANI:** Yeah, right, I think Larry
6 did as well.

7 Seventh comment: Table 2-2 from
8 Volume 2 of the TBD -- that's in the old
9 volume -- has been referred to several times
10 in your site profile revision. However, it
11 has been noted that this table does not
12 provide a complete list of relevant
13 radionuclides which problem should be
14 corrected. External dose TBD should use a
15 table with a complete list of relevant
16 radionuclides.

17 Eighth comment: Table 6-10 is
18 confusing and should be clarified as to the
19 connection with the standard value for
20 relative biological effectiveness.

21 Ninth comment: Table 6-13 states that
22 photon doses are indicated for atmospheric
23 safety test areas although test number four ^,
24 and data should be included in this table for
25 that event. Also, there were other such tests

1 on the Tonopah Test Range, use of either the ^
2 plain surface or soil contaminated to an
3 infinite depth is not appropriate for fallout.

4 ^ notes that exposure factors derived
5 by ^ 1980 for exponentially distributed^
6 sources. ^ exponentially distributed source
7 are more appropriate, but such factors are not
8 used here^. The ^ for beta contamination for
9 60 tests in Table 6-14 is not appropriate for
10 the same reason.

11 Tenth comment: On page 91 there's a
12 comment about low humidity is not valid for
13 tunnel workers.

14 And eleventh comment: Section 6.4.1.1
15 of the TBD contains Table 6-11 which lists 50
16 percent and 95 percent annual doses for 1945
17 through 1957. These doses are based on site-
18 wide averages. It's not clear why such a
19 broad-brush approach is being used. The
20 consequence of this approach is that the
21 claimant may have their assigned dose diluted,
22 especially in the years when testing did not
23 occur.

24 Although it is not clear from the TBD,
25 ^ activities involve exposure to the radiation

1 ^ no tests. For example, visits to previously
2 contaminated ^ involving radiation
3 radiography, ^ handling, et cetera, may have
4 occurred during ^. Data should be refined to
5 be job or location specific.

6 And the last comment: Ignoring beta
7 dose is only appropriate in a minimum
8 efficiency approach for a case that will be
9 compensated. This is not made explicit. The
10 language in the above statement should be
11 clarified to state that the zero electron
12 doses are a reasonable approach only for
13 minimal dose calculations in compensable
14 cases.

15 And those were the comments.

16 **MR. ELLIOTT:** I don't think we have any
17 questions for clarification.

18 **DR. WADE:** We're done. Do you want to talk
19 a little about when you'll meet again or --

20 **MR. PRESLEY:** Well, I guess we need to.
21 Now, as I see it, SC&A, number one, they have
22 quite a bit to do to get these pages, and so
23 does Mark, because he's got some of the stuff
24 to come up. We're going to try to put this
25 thing on the table in Nevada. Is that

1 correct, Lew?

2 **DR. WADE:** Yes.

3 **MR. PRESLEY:** As I see it, once everybody
4 gets everything looked at, if there's a
5 possibility maybe with us getting together the
6 first of January. Let's see, we go to Nevada
7 --

8 **DR. WADE:** The 8th, 9th, 10th.

9 **MR. PRESLEY:** What?

10 **DR. WADE:** Eight, nine, ten.

11 **MR. PRESLEY:** Eight, nine, ten. I'm
12 wondering if it's a possibility that we might
13 get together on a conference call some time
14 the week before that. I realize that's not
15 much time for everybody to, if we've got a
16 problem or anything like that to go back and
17 respond to it. Either that or the week before
18 Christmas I have wide open.

19 **DR. ROESSLER:** I'm committed that week, the
20 week before Christmas. And when you talk
21 about the week before Nevada, you're talking
22 about the first few days in January?
23 Somewhere in there?

24 **MR. ELLIOTT:** Second through the fourth.

25 **MR. PRESLEY:** Yeah, 2nd, 3rd and 4th. We've

1 got a Procedures working group in Cincinnati
2 December the 11th.

3 **MS. MUNN:** Yes, we do.

4 **MR. PRESLEY:** Wanda will be here. I will be
5 here.

6 **DR. ROESSLER:** And I'll be in San Antonio
7 for a Society for Risk Analysis meeting that
8 week. But the week before Christmas I could
9 be available for a conference call. How long
10 do you think the conference call might take?

11 **DR. WADE:** We'll try for December 19th?

12 **DR. ROESSLER:** What?

13 **DR. WADE:** December 19th for a conference
14 call.

15 **MR. PRESLEY:** We had that date set up
16 before.

17 Wanda?

18 **MS. MUNN:** Oh, yeah, sure.

19 **DR. WADE:** Wanda enthusiastically endorses.

20 **DR. ROESSLER:** Can I call from the beach in
21 Florida?

22 **MR. ELLIOTT:** What about December 4th? Can
23 we have all our stuff done by then? Is that a
24 good, I mean, that moves everything up I know,
25 but --

1 **MR. ROLFES:** Gene, how do we feel about
2 having things? Do we think we can resolve the
3 outstanding issues on the fourth, by the
4 fourth of December?

5 **MR. ROLLINS (by Telephone):** If we don't
6 have them resolved, we can certainly have a
7 path forward.

8 **DR. ROESSLER:** But SC&A needs some time.

9 **MR. ELLIOTT:** It's got to be delivered
10 before the fourth so it can be digested.

11 **MR. PRESLEY:** Yeah, it's got to get to them
12 so they've got time.

13 **MR. ROLFES:** It cuts down our amount of
14 time.

15 Gene, how long do you feel that some
16 of these items might require in order to
17 respond?

18 **MR. ELLIOTT:** Well, if we can finish it by
19 the fourth, can we, the 19th looks more
20 reasonable then.

21 **MR. ROLLINS (by Telephone):** These
22 activities are going to require a good bit of
23 data capture. I don't really have a feel for
24 how easy that's going to be to do.

25 **MR. PRESLEY:** Can we shoot for the 19th, and

1 if it doesn't come about, then we'll back up
2 and punt? My only other thing about this is
3 we are to be there Tuesday, Wednesday and
4 Thursday. There is a possibility that we
5 could do like we did before and have a Monday,
6 the 7th, meeting to discuss and cuss and
7 possibly come up with a recommendation.

8 **MS. MUNN:** I can do that.

9 **DR. ROESSLER:** I like that.

10 **MS. MUNN:** That ought to give everybody
11 enough time to do what they need to do.

12 **MR. PRESLEY:** I think I can travel on the 6th
13 of January if I have to. There's something in
14 there, and I don't have it on my calendar.
15 I'm sorry, but I think I can travel on that
16 Sunday.

17 **MS. MUNN:** There's a lot of direct flights
18 to Las Vegas. You can catch a morning flight
19 and be there well before noon and have an
20 afternoon/evening session.

21 **MR. PRESLEY:** We could do that. So we're
22 going to, let's shoot for the 19th, a
23 conference call.

24 Larry, can you set that up, please?

25 **DR. ROESSLER:** We're going to do both?

1 **MR. PRESLEY:** Let's see if we can knock this
2 thing in the head with a conference call on
3 the 19th. If not, then we'll meet on the
4 seventh in Nevada.

5 **DR. WADE:** So that's tentative.

6 **DR. ROESSLER:** So we really can't make
7 airline reservations or anything until we
8 know. Or we could make them and change them.

9 **MR. PRESLEY:** Make them and change them.

10 **DR. WADE:** We'll be booking a hotel room. I
11 guess we'll have to so if we change we just
12 have a hotel room we can all go to.

13 **MR. PRESLEY:** Wanda, eleven o'clock eastern
14 standard time?

15 **MS. MUNN:** Eleven o'clock will be fine on
16 the 19th.

17 **MR. PRESLEY:** That all right with everybody
18 else?

19 **MR. ELLIOTT:** Yes.

20 **DR. WADE:** And then if we go on the seventh,
21 we'll do it mid-day so people can travel in
22 that morning.

23 **MR. PRESLEY:** If we have to. Start at noon.

24 **DR. WADE:** Okay.

25 **MS. MUNN:** Start at nine if we do it on the

1 seventh?

2 **DR. WADE:** Noon.

3 **MR. PRESLEY:** We will supply supper if we
4 run over. How's that?

5 **MR. ELLIOTT:** But the 19th you're starting at
6 11?

7 **DR. WADE:** Say again, Larry?

8 **MR. ELLIOTT:** But the 19th you're starting at
9 11 a.m. teleconference.

10 **MR. PRESLEY:** Eleven a.m. eastern standard
11 time.

12 **DR. WADE:** The seventh tentatively at noon
13 Las Vegas time.

14 **MR. PRESLEY:** Make sure if we're at the
15 Westin that we get the big room, please, and
16 they don't put us in that stage again like
17 they did.

18 **DR. WADE:** Yeah, that was pretty mean.

19 **MR. PRESLEY:** That was awful. Does anybody
20 else have anything?

21 **DR. WADE:** No, thank you all very much.
22 We're going to cut the phone call now. Thank
23 you for your patience on the phone, your
24 perseverance. You're good people.

25 (Whereupon, the work group meeting adjourned

at 3:00 p.m.)

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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 Oct. 25, 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 26th day of Sept., 2008.

STEVEN RAY GREEN, CCR, CVR-CM, PNSC
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