

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

ROCKY FLATS

The verbatim transcript of the Working
Group Meeting of the Advisory Board on Radiation and
Worker Health held in Hebron, Kentucky on
March 28, 2006.

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TRANSCRIPT LEGEND

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-- (sic) denotes an incorrect usage or pronunciation of a word which is transcribed in its original form as reported.

-- (phonetically) indicates a phonetic spelling of the word if no confirmation of the correct spelling is available.

-- "uh-huh" represents an affirmative response, and "uh-uh" represents a negative response.

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

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

P A R T I C I P A N T S

(By Group, in Alphabetical Order)

BOARD MEMBERSEXECUTIVE SECRETARY

WADE, Lewis, Ph.D.

Senior Science Advisor

National Institute for Occupational Safety and Health

Centers for Disease Control and Prevention

Washington, DC

MEMBERSHIP

GIBSON, Michael H.

President

Paper, Allied-Industrial, Chemical, and Energy Union

Local 5-4200

Miamisburg, Ohio

GRIFFON, Mark A.

President

Creative Pollution Solutions, Inc.

Salem, New Hampshire

MUNN, Wanda I.

Senior Nuclear Engineer (Retired)

Richland, Washington

PRESLEY, Robert W.

Special Projects Engineer

BWXT Y12 National Security Complex

Clinton, Tennessee

IDENTIFIED PARTICIPANTS

ALLEN, DAVE, NIOSH
BARRIE, TERRIE, ANWAG
ELLIOTT, LARRY, NIOSH
FALK, ROGER, ORAU
FITZGERALD, JOE, SC&A
GLOVER, SAM, NIOSH
HARDEN, JERRY
HOWELL, EMILY, HHS
JESSEN, KARIN, ORAUT
KATZ, TED, NIOSH
KOTSCH, JEFF, DOL
LANGSTED, JIM, ORAU
LITTLE, CRAIG, ORAU
MAKHIJANI, ARJUN, SC&A
MAURO, JOHN, SC&A
MEYER, BOB, ORAU
NETON, JIM, NIOSH
REID, STEVE, ORAU
ROBINSON, AL, ORAU
SMITH, MATTHEW, ORAU
SUNDIN, DAVE, NIOSH
THOMPSON, JENNIFER, PETITIONER
ULSH, BRANT, NIOSH

P R O C E E D I N G S

(10:10 a.m.)

1
2
3 (Note from the Court Reporter: The following
4 transcript contains a great number of
5 "unintelligible" messages. Unfortunately
6 transcription was often rendered impossible due to
7 faulty audio-visual equipment of the meeting facility
8 and poor telephonic connections. Please know these
9 gaps in transcription are not the fault of the court
10 reporter and not the fault of the speakers.)

WELCOME AND OPENING COMMENTS**DR. LEWIS WADE, DFO**

11 **DR. WADE:** This is Lew Wade. I'd like to
12 welcome the working group, the meeting of the
13 working group. This is the working group that
14 deals with issues related to site profiles,
15 reviews of individual dose reconstructions and
16 reviews of procedures. The group is ably
17 chaired by Mark Griffon and consists of Mike
18 Gibson, Bob Presley and Wanda Munn. All of
19 those individuals are with us either by phone
20 or around the table in Cincinnati. Let me sort
21 of briefly set the table for what we're doing
22 and what will follow based upon what we're

1 doing. The Board has responsibility, statutory
2 responsibility to review individual dose
3 reconstructions. To assist them with that
4 responsibility the Board has taken on the --
5 the task of reviewing site profiles which are
6 documents that dose reconstructions can be
7 based upon. The Board has been involved in a
8 review of the Rocky Flats site profile for some
9 time now. The Board has used its contractor,
10 Sanford Cohen and Associates, to assist in the
11 review of that site profile. Recently with the
12 awareness that there was an SEC petition
13 pending on Rocky Flats, this working group and
14 the Board has asked that the focus of the site
15 profile really for the time being be on issues
16 that are related to the SEC petition; but again
17 we're still looking at the subcommittee and its
18 work of reviewing site profiles. Once this
19 meeting is over some things will happen. NIOSH
20 intends to release its petition evaluation
21 report on the Rocky Flats SEC petition in the
22 first week of April. This working group will
23 reconvene on the morning of April 12th and will
24 take on the responsibilities of the SEC
25 petition. Again much of what we -- we talk

1 about here today will inform and guide those
2 discussions but when this group meets again on
3 the 12th, its focus will be particularly on the
4 SEC petition and the petition evaluation
5 report. It is anticipated that the Board will
6 debate during its April 25th, 26th and 27th
7 meeting, full Board meeting, the Rocky Flats
8 SEC petition and come to some recommendation on
9 that petition. So that's what we're doing
10 here, looking at technical issues in the site
11 profile with a particular eye towards the SEC
12 petition. And then on the 12th we'll be
13 focused particularly on the SEC petition.
14 Well, I'd like to do a couple of things now.
15 I'd like to go around and introduce the people
16 who are here around the table. I'd like to
17 introduce people on the phone starting with
18 representatives of the NIOSH or ORAU teams, the
19 SC&A teams, obviously the Board members
20 present, other federal employees that are
21 present on the call, anyone directly involved
22 in Rocky Flats; petitioners, members of
23 Congress or representatives of those members
24 who have an interest; and then anyone else who
25 would like to be identified. Then we'll have a

1 bit of a conflict of interest discussion where
2 I'll talk a little bit about the Board and its
3 members relative to Rocky Flats. I would ask
4 the leader of the NIOSH delegation to identify
5 his team including identifying any conflicts
6 that exist. I would ask the leader of the SC&A
7 to do the same thing. And then I'll turn it
8 over to Mark and Wanda to begin the
9 deliberations. So with that as an action plan
10 we'll start around this table. Again, my name
11 is Lew Wade. I work for NIOSH and have the
12 privilege of serving as the Designated Federal
13 Official for the Advisory Board.

14 **MR. LITTLE:** My name is Craig Little. I'm with
15 the ORAU team.

16 **MR. FALK:** And my name is Roger Falk. I'm with
17 the ORAU team.

18 **MR. LANGSTED:** Jim Langsted with the ORAU team.

19 **MR. MEYER:** Bob Meyer with the ORAU team.

20 **DR. ULSH:** I'm Brant Ulsh with NIOSH.

21 **DR. NETON:** Jim Neton with NIOSH.

22 **MR. ALLEN:** Dave Allen with NIOSH.

23 **DR. GLOVER:** Sam Glover with NIOSH.

24 **DR. MAKHIJANI:** Arjun Makhijani with SC&A.

25 **MR. FITZGERALD:** Joe Fitzgerald with SC&A.

1 **MR. PRESLEY:** Robert Presley with the Board.

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

3 **MS. MUNN:** Wanda Munn with the Board.

4 **DR. MAURO:** John Mauro with SC&A.

5 **MR. ELLIOTT:** Larry Elliott, NIOSH.

6 **DR. WADE:** Now, before I turn to have members
7 on the phone identify themselves, one note from
8 Ray. If at all possible, please try and use
9 the handset on your phone and not a speaker
10 phone. It works much better for us here. If
11 anyone has any problems hearing or being heard
12 we'll yell at you, you yell at us. We want to
13 make use of all the talent that's here and on
14 the line. Let's start with members of the
15 Board who are on the call.

16 **MR. GRIFFON:** Mark Griffon.

17 **MR. GIBSON:** Mike Gibson.

18 **DR. WADE:** Thank you. Members of the NIOSH and
19 ORAU team who are on the phone.

20 **MS. JESSEN:** Karin Jessen, ORAU team.

21 **UNIDENTIFIED:** Kay (unintelligible), ORAU team.

22 **UNIDENTIFIED:** (Unintelligible), ORAU team.

23 **DR. WADE:** That last gentleman needs to speak
24 louder and more clearly.

25 **UNIDENTIFIED:** (Unintelligible), ORAU team.

1 conflict of interest discussion in three parts.
2 As it turns out there are no Board members on
3 this working group who are conflicted on Rocky
4 Flats and therefore there are no prohibitions
5 to the full participation of any of the working
6 group members either in the discussion on site
7 profile or SEC petition. Now, I would ask the
8 leader of the NIOSH ORAU team to identify
9 members and potential conflicts.

10 **DR. ULSH:** I'll handle that, Lew. With regard
11 to the ORAU team members present here in the
12 room we've got Jim Langsted and Roger Falk,
13 both of whom have long working histories at
14 Rocky Flats. They're here in the capacity of
15 subject matter experts. I am heading up the
16 team that's evaluating the SEC petition that
17 was submitted and Karin Jessen is on the phone.
18 She is heading up the response to the -- she's
19 preparing our evaluation report. There's no
20 conflict there. I think it's just Jim and
21 Roger, and so they are here in the capacity of
22 subject matter experts.

23 **DR. WADE:** Okay. SC&A?

24 **DR. MAURO:** Participants here today are myself,
25 John Mauro, Joe Fitzgerald, Arjun Makhijani and

1 Dunstana Melo. None of us have a conflict;
2 however I would like to ask Joe to just
3 summarize briefly his role, one, with DOE, and
4 his relationship in that role regarding Rocky
5 Flats.

6 **MR. FITZGERALD:** Yeah. First off, I worked for
7 the Department of Energy from 1980 to 2001,
8 headed the Health and Safety office of DOE
9 headquarters from '91 to 2001, and was
10 basically responsible for all the policies and
11 regulations on radiation protection for the
12 Department of Energy for that time span. But
13 certainly nothing that would be linked to the
14 operations of the Rad program at Rocky or any
15 of the actual procedures or policies
16 implemented at the site. So I don't --
17 certainly don't see a conflict of interest.

18 **DR. WADE:** Okay. I think that brings us to
19 starting the deliberations of the meeting. I
20 will point out that this is a public meeting
21 but we've allowed no opportunity for public
22 comment. We have, as is our process, allowed
23 petitioners to -- to make comment as they feel
24 is appropriate and ask questions and make
25 contribution. So any of the petitioners or

1 their representatives, you're allowed to fully
2 participate and that's encouraged. Wanda or
3 Mark, please?

4 **MR. GRIFFON:** Yeah. I think, Wanda, we're just
5 going to stay with the matrix so -- the matrix
6 that we had worked from, dated February 27th,
7 2006. And I think if it makes sense we'll just
8 do like we did with Y-12, go down the action
9 items and work from there. Is that okay,
10 Brant?

11 **DR. ULSH:** Sure.

12 **TIB 49**

13 **MR. GRIFFON:** Okay. So the first one is
14 actually probably the most lengthy discussion
15 that we'll get into. Item 1A is the TIB 49.

16 **DR. ULSH:** We're in the process of --

17 **MR. GRIFFON:** I think you've -- you've provided
18 quite a bit of information on this so I'll let
19 you take it over, Brant.

20 **DR. ULSH:** We're in the process of getting the
21 handout going around the table here, Mark.
22 Just give us a couple of minutes. And actually
23 as you mentioned, TIB 49, a draft of it has
24 been delivered to SC&A along with a lot of
25 supporting material. Jim Neton has been

1 heavily involved with this, and I think he's
2 going to head up the discussion on our approach
3 for super S.

4 **MR. GRIFFON:** Now, what you're handing out can
5 you -- do I have that? Do we have that?

6 **DR. NETON:** You should have, Mark. That's
7 titled, "An Approach to Dose Reconstruction for
8 Super Type S Material," dated March 21st, 2006.

9 **MS. MUNN:** Jim sent it out by email.

10 **DR. NETON:** It went out a few days ago.

11 **MR. GRIFFON:** Okay.

12 **DR. NETON:** So I'll be speaking from two
13 documents. One is the draft OTIB 49, a
14 document that was sent out awhile ago; I've
15 forgotten what time. It's also on the O drive.
16 And also what I would call a supplement to OTIB
17 49 which is titled, "The Approach to Dose
18 Reconstruction for Super Type S Material." I
19 think I'm just going to summarize where we're
20 at with this and just I've got a couple control
21 dosimetry experts from NIOSH with me to back me
22 up on some of these analyses. And I'll just
23 open the floor for discussion. OTIB 49 if you
24 looked at it is our approach to correcting for
25 the differential solubility of varying

1 solubles, so-called super type S material
2 versus what would be normally the ICRP default
3 of a soluble material called type S. It's
4 recognized in several places, Rocky Flats among
5 them, that there are forms of plutonium that
6 just do not behave like type S material. That
7 is they -- they leave the lungs much more
8 slowly than one would expect. To look at this,
9 the difference in the lung dose per -- on a per
10 unit intake basis -- that is if I inhaled the
11 same amount of type S material and the same
12 amount of type super S material, what would be
13 the difference in -- in lung dose over time?
14 We put a team of experts together to evaluate a
15 number of cases. In TIB 49 there were ten
16 design cases that were evaluated. Nine of
17 those cases were specific to Rocky Flats and
18 there was one case that was well documented
19 exposure at the Hanford facility. When one
20 looked at the retention of plutonium in the
21 lungs of those ten design cases, two stood out
22 as having very similar clearances and very --
23 and also exhibited the longest retention times
24 of any of the ten cases. The two cases are
25 Rocky Flats 872 and the so-called Hanford 1

1 case. In the TIB 49 document one looks at the
2 clearance of those two cases overlapped on the
3 graph. They're -- They're virtually identical
4 with some exceptions in the very early time
5 periods. The decision was made by the expert
6 team to use those two cases as bounding
7 analyses, that is the most insoluble materials
8 to calculate the difference in the lung dose
9 over time. So an analysis was done using our
10 IMBA software where the case was evaluated
11 using the available lung monitoring data and
12 the available urinalysis data to fit a
13 retention code. Based on those retention codes
14 one can calculate then the estimated difference
15 in the dose between how the retention in the
16 lungs would behave for super S versus S and in
17 the analysis since HAN 1 and Rocky Flats 872
18 are so close, they chose to create an
19 adjustment factor per year based on the case
20 that exhibited the highest difference between
21 super S and -- and S. So that's the basis of
22 TIB 49, so it really is a look-up table
23 document that -- that one would, if I knew the
24 intake of type S -- if I knew the intake of
25 material, how much more dose would I have to

1 assign to a person because of the lengthy
2 clearance of super S from the lungs. That
3 takes care of one issue we think. That issue
4 is how are the lung doses determined.

5 **MR. GRIFFON:** I was curious about you said you
6 -- you had ten design cases?

7 **DR. NETON:** Uh-huh.

8 **MR. GRIFFON:** What was the universe of cases,
9 or was that the universe of cases? I don't
10 understand how you -- how you got to these
11 cases. Some of them were known from a
12 plutonium fire; is that correct? Or --

13 **DR. NETON:** Right. I think Roger Falk, who is
14 sitting here, was one of the experts that
15 participated in -- in this analysis and I -- I
16 can -- the experts are listed on the document.
17 They're Tom LaBone, Roger Falk, and Don Bihl.
18 Since Roger's here maybe he could comment on
19 the selection process.

20 **MS. MUNN:** Roger, turn that mike around.

21 **MR. FALK:** The cases were chosen based on being
22 clean cases. That means that they had no
23 significant previous exposures to the -- to the
24 one major exposure that gave them a very high
25 lung dose or a very high lung deposition. We

1 had six of those cases and they also
2 participated in the medical monitoring program
3 that we conducted from 1993 to -- to -- to the
4 year 2003, which meant that we had modern lung
5 count and urine data for these cases at about
6 35 to 40 years after the intake. So we had a
7 very good measurement of both their early lung
8 deposition starting in 1965 as well as recent
9 measurements with the state of the art
10 techniques in the -- in -- in the 1990s and
11 into the -- into the year 2000s. So we had
12 both the early data and the long-term data for
13 these. These were also very high lung
14 deposition cases; therefore there was no --
15 there was no -- there was no issue about being
16 down in the mud. They were very clean cases.
17 And we had six of those from the 1969 plutonium
18 fire. We had one case from the 1969 plutonium
19 fire that was -- that was in building 76 and
20 77. We had one case from a -- from a plutonium
21 fire in a building 71 lab which was a very high
22 case and we also added one case that was not
23 exposed to high fired -- that was not exposed
24 to a plutonium fire but was -- but was also --
25 but was exposed to a naturally oxidized

1 plutonium that was a glove failure. And then
2 we have the Hanford 1 case which was a very
3 well-documented case up at Hanford.

4 **MR. GRIFFON:** And can you -- the 872 case, the
5 bounding case, was that from one of the fires
6 or was --

7 **MR. FALK:** Yes.

8 **MR. GRIFFON:** And how many of these cases
9 involved --

10 **MR. FALK:** That was from the 1969 plutonium
11 fire.

12 **MR. GRIFFON:** And how many of -- of these cases
13 involved chelation treatment or were these I
14 guess most of them should be bounding cases
15 used on chelation?

16 **MR. FALK:** Three of the cases for the 1969
17 plutonium fire were not chelated. All of the
18 other cases were.

19 **MR. GRIFFON:** Okay. And 872?

20 **MR. FALK:** 872 was a chelated case.

21 **MR. GRIFFON:** All right. Thank you. I just
22 wanted to get the parameters there.

23 **MR. FALK:** We're -- We're fairly comfortable
24 that the chelation is not affecting the overall
25 model -- the calculations. Chelation for these

1 super insoluble materials is -- is largely
2 ineffective.

3 **MS. MUNN:** Doesn't appear to do anything.

4 **MR. FALK:** And you can only chelate
5 systemically available material anyways.

6 **MR. GRIFFON:** All right. Thank you.

7 **UNIDENTIFIED:** Excuse me. (Unintelligible).
8 I'd like to ask a question.

9 **MR. FALK:** Sure.

10 **MS. MELO:** I'd like to know why
11 (unintelligible).

12 **MR. GRIFFON:** Jim, can you paraphrase that
13 question? I couldn't hear her.

14 **DR. NETON:** I had trouble myself, Mark.

15 **MR. GRIFFON:** Okay.

16 **DR. NETON:** I think the question was why we
17 didn't use a USTUR case and what number was
18 that?

19 **UNIDENTIFIED:** It was 259.

20 **DR. NETON:** 259?

21 **MS. MELO:** 259, yes.

22 **DR. NETON:** Okay. And -- And our
23 understanding is that that would have been a
24 plutonium 238 case, not plutonium 239.

25 **MS. MELO:** (Unintelligible).

1 **DR. GLOVER:** May I address the case briefly?
2 I'm a -- I was a radium chemist with the U.S.
3 Transuranium and Uranium Registries. The case
4 was a ceramicized uranium 238 material that had
5 differential solubilities of function of time
6 because a Pu-238 has such a high specific
7 activity that it degrades the material. We are
8 talking about plutonium material that doesn't
9 have that much -- the specific activity is much
10 lower and it's not going to exhibit this
11 differential degradation because of that. And
12 so we specifically excluded plutonium 238 from
13 this TIB evaluation. That is not part of this.

14 **DR. MAURO:** For my edification I was aware that
15 there was this distinction because of specific
16 activity related to 238 versus 239. And you
17 had just mentioned the reason has to do with
18 the higher specific activity; but the 238
19 causes it to behave physically and chemically
20 differently so you refer to degradation.
21 Wouldn't that accelerate?

22 **DR. GLOVER:** It accelerates the -- the -- the
23 solubility.

24 **DR. MAURO:** The clearance. But what I heard
25 was the opposite though. What I just heard was

1 that it was -- it was cleared more slowly. I
2 guess I was wondering -- there was a question -
3 -

4 **MS. MELO:** (Unintelligible).

5 **DR. GLOVER:** In the first -- the very beginning
6 it starts out as ceramicized material and then
7 quickly begins to degrade.

8 **DR. MAURO:** Okay.

9 **DR. GLOVER:** So the long-term differentials
10 that we're talking about don't exist.

11 **DR. MAURO:** Got you.

12 **DR. GLOVER:** So they will become more
13 solublized as you break the -- the chemical
14 structure down, the crystal lattice, it becomes
15 chemically available.

16 **DR. MAURO:** So if you get in the earlier time
17 periods it moves more slowly but as it degrades
18 it'll clear more quickly?

19 **DR. GLOVER:** And that happens fairly quickly.

20 **DR. MAURO:** Okay. I got it.

21 **MR. FALK:** And by quickly what -- what are we -
22 -

23 **DR. GLOVER:** I'd have to --

24 **MR. FALK:** Yeah.

25 **DR. GLOVER:** It's been awhile since I've looked

1 at that case. I do have the design parameters
2 for that case.

3 **DR. MAURO:** I have a sort of a common sense
4 question. In the cases that you ran, the --
5 the slower clearance rates associated with the
6 cases you picked, what -- what -- how did that
7 -- what is the biological half-life for I guess
8 the long-term component for S versus the
9 longest-term component for the super S that you
10 looked at? In other words, how much of a
11 difference was the clearance rate for the --
12 the long-term compartment for the lung for the
13 case that you're using as your -- your
14 representative case?

15 **MR. FALK:** I did not calculate that
16 specifically but -- but the main -- the main
17 clearance factor is in what the -- what the
18 lung model calls the AI3 compartment clearing
19 either to the BB1 which is the small bronchials
20 or to the -- or to the lymph nodes. We used as
21 the tenth minus six per day. One could -- One
22 could also use the value of the tenth minus
23 fifth but it basically -- but it basically
24 keeps the material into the AI region which is
25 actually claimant favorable relative to -- to -

1 - relative to having it go to the lymph nodes
2 or -- or than to be cleared.

3 **DR. MAURO:** The -- In effect a tenth minus six
4 per day for that compartment, for all intents
5 and purposes it's -- it's not leaving.

6 **MR. FALK:** That is right.

7 **DR. MAURO:** So if -- if you were to run this
8 very same calculation saying that it doesn't
9 leave for the purpose of doing lung dose, lung
10 dose --

11 **MR. FALK:** Yes.

12 **DR. MAURO:** You'd probably come up with the
13 same dose. In other words, I understand why
14 you would go to look into the Transuranic
15 Registry to try to come up with relationships
16 between lung counts I guess and clearance
17 rates. But I'm looking at it from a very
18 simple point of view. If we simply say to stop
19 with the point of the view of the lung dose
20 now, it never leaves.

21 **MR. FALK:** Once you get past maybe -- once you
22 get past maybe 1,000 days or so, which is about
23 -- which is about three years or so it -- it
24 probably doesn't clear to any noticeable
25 extent.

1 **DR. MAURO:** Now -- Now, the fraction that's
2 assumed to be in the slow component, is that
3 also changed? In other words, I'm thinking
4 (unintelligible) quite frankly my familiarity
5 of the lung dynamics goes back a little ways.
6 And I think in terms of the fraction of those
7 to the deep lung and then its retention and in
8 terms of the high fired plutonium is the
9 fraction that's assumed to go to deep lung a
10 larger fraction so there -- so there really are
11 two things going on? One, what's inhaled, more
12 of it is going to the deep lung and that
13 portion that is going to the deep lung is
14 moving a lot more slowly. Would that be a -- I
15 guess I would like to get a feeling between how
16 different that is from the classic, let's say
17 type S approach.

18 **MR. FALK:** The -- The -- The values for the
19 ten cases were actually variable but it turns
20 out that -- that both the HAN 1 and the -- in
21 Rocky Flats 872 had a similarly fairly high
22 fraction which was actually retained in a long-
23 term manner. But that is a -- but that -- but
24 that does vary from the case to case.

25 **DR. NETON:** I think -- excuse me, but I think

1 John was asking is -- is -- are the deposition
2 parameters different and they are.

3 **DR. MAURO:** Yes. They --

4 **DR. NETON:** The initial deposition in the
5 compartments of the lungs is the same.

6 **DR. MAURO:** Okay.

7 **DR. NETON:** You're not changing aerodynamic
8 properties of the materials.

9 **DR. MAURO:** Okay.

10 **DR. NETON:** And that's pretty much based on
11 where they deposit in the various regions.

12 **DR. MAURO:** Except if you change the particle
13 sizes to reflect.

14 **DR. NETON:** Yeah.

15 **DR. MAURO:** And you looked at that, too.

16 **DR. NETON:** Right. Yes.

17 **DR. MAURO:** Yes.

18 **DR. NETON:** But -- But what does change is
19 your -- it says here chemical solubility and/or
20 your mechanical clearance properties. Now, it
21 turns out in developing these models you
22 couldn't shut down the clearance enough. If
23 you shut down the clearance to almost nothing
24 your mechanical -- your chemical clearance,
25 your mechanical clearance was still clearing it

1 much too quickly based on -- based on the super
2 S -- the type S model. So in essence they had
3 to close down some of the clearance properties
4 as well, mechanical clearance properties.
5 There are a couple things going on.

6 **DR. MAURO:** Right.

7 **DR. NETON:** And no one really quite understands
8 this but for large doses people speculate that
9 there is actually tissue damage, fibrotic
10 lesions that --

11 **MS. MUNN:** Must be.

12 **DR. NETON:** -- but no one really knows because
13 you can only see and measure these effects in
14 large inhalation cases. If -- If they're
15 small you wouldn't see them necessarily and
16 then, you know, you wouldn't know.

17 **MR. GRIFFON:** Okay. Any further discussion on
18 the issues? I'm a little bit concerned -- this
19 -- this ceramic materials -- first of all I've
20 heard the statement that there was a lot of
21 plutonium 238 at Rocky Flats. Is that --

22 **MR. FALK:** No.

23 **DR. NETON:** I didn't think that was an issue.

24 **MR. FALK:** There was a trace amount in weapons
25 grade on the order of maybe 200 parts per

1 million. It wasn't a very significant
2 component.

3 **DR. NETON:** So it seems to me a design case
4 would be based on plutonium 239 because of this
5 differential solubility issue and the
6 ceramicized oxide. I'm not sure where this
7 case is from, what site. Dunstana, do you know
8 which facility the USTUR 259 came from?

9 **MS. MELO:** What?

10 **DR. NETON:** Do you know which DOE facility the
11 case that you spoke of --

12 **MS. MELO:** Los Alamos.

13 **DR. NETON:** Los Alamos?

14 **MS. MELO:** Los Alamos.

15 **DR. NETON:** Right.

16 **DR. MAKHIJANI:** Roger, this is Arjun. Weren't
17 there plutonium 238 RTG's made at Rocky Flats?

18 **MR. FALK:** What type?

19 **DR. MAKHIJANI:** RTG's.

20 **UNIDENTIFIED:** RTG's.

21 **MS. MUNN:** RTG's.

22 **DR. MAKHIJANI:** Did Rocky Flats manufacture
23 RTG's?

24 **UNIDENTIFIED:** Thermal generators.

25 **DR. MAKHIJANI:** Thermo-electric radio-isotope

1 (unintelligible).

2 **MR. FALK:** I am not aware of that.

3 **MS. MUNN:** I thought it was all Los Alamos and
4 Hanford.

5 **DR. MAKHIJANI:** So I guess --

6 **UNIDENTIFIED:** Hello?

7 **MR. GRIFFON:** (Unintelligible) manufactured the
8 heat source for that.

9 **DR. NETON:** Right.

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

11 **DR. NETON:** So it seems to me that the issue
12 with USTUR 259 has to deal with two things.
13 One is it was plutonium 238 which does not
14 appear to be in -- present in significant
15 quantities at Rocky Flats. And secondly I
16 think the ceramicized matrix issue is something
17 special possibly for Los Alamos. And I think
18 we're fairly comfortable using Rocky Flats
19 cases to do Rocky Flats calculations as well.
20 So okay.

21 **DR. MAKHIJANI:** Before we leave that, I have --
22 I have a document here, a Rocky Flats
23 (unintelligible) from the 1990s that talk about
24 (unintelligible). And 107 items, 12 of which
25 are americium 241, 38, plutonium 239, 57,

1 plutonium 238. They also have a
2 (unintelligible) 90. Now, they may have come
3 from outside, obviously, sources. It doesn't
4 say -- this is a remediation document,
5 management document, so I could not tell
6 whether they were made there or whether they
7 were imported.

8 **DR. NETON:** If they were imported, it by
9 definition (unintelligible) sources.

10 **DR. MAKHIJANI:** Yeah. No, so then -- then you
11 wouldn't have an issue.

12 **DR. NETON:** Right.

13 **DR. MAKHIJANI:** But if they were made there
14 then obviously these various -- I'd be happy to
15 email you because you know this.

16 **DR. NETON:** Okay. Okay, if there's no other
17 questions on this.

18 **MR. GRIFFON:** Jim?

19 **DR. NETON:** Yeah.

20 **MR. GRIFFON:** Jim, just one other question on
21 TIB 49. I'm looking at the very back of page
22 37.

23 **DR. NETON:** Yes.

24 **MR. GRIFFON:** And again I've just quickly
25 looked at this, the HAN-1 and the RF872 cases -

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DR. NETON: Uh-huh.

MR. GRIFFON: Those -- Those parameters there

--

DR. NETON: Yes.

MR. GRIFFON: They were derived from the lung data. How -- How -- How did you -- How did you come up with those parameters?

DR. NETON: Well, Roger could probably speak better but they were fit using the IMBA software, you know, intake to bioassay and you've got -- you've got lung monitoring data and urine -- urinalysis data for these cases. And -- And the moral -- the analysis to give it the best fit to the available data generated those parameters.

MR. GRIFFON: Okay. Because we have some problems, well, some differences, you know.

DR. NETON: You can see -- You can see them plotted over the top of each other on page 35 and --

MR. GRIFFON: Right.

DR. NETON: -- they virtually overlap except for, you know, the earlier time periods. As I said, both models -- both calculations were

1 used and the one that gave the higher derived
2 lung adjustment factor would be applied.

3 **MR. GRIFFON:** Right.

4 **DR. NETON:** I do think that this represents in
5 our mind a bounding -- a bounding scenario.
6 Now that -- that -- that will account for the
7 adjustment for the lung doses but you have
8 another issue when you want to start
9 calculating intake because you're going to rely
10 on something such as urine samples. And by
11 definition since the material leaves the lung
12 more slowly, then what's known as the intake
13 retention fraction is going to be different for
14 the more insoluble material. You're going to
15 have less coming out in the -- in the urine per
16 unit inhalation for the super S material than
17 you would for the S type material. To account
18 for that we --

19 **MR. GRIFFON:** Can I just step away for one
20 second and understand this, Jim? I'm sorry.

21 **DR. NETON:** Yeah.

22 **MR. GRIFFON:** It looks to me like these are
23 pretty much -- these sets are -- are they just
24 based on simply mathematical sets or are they
25 empirical because it looks like you're

1 adjusting any parameter you need to to get the
2 best fill-in data. I'm wondering if -- if
3 there's a point where you can say, you know,
4 well, we -- we don't have any reason from a
5 biological standpoint to modify these
6 parameters differently in the same sets of
7 cases. Do you know what I'm saying?

8 **DR. NETON:** Not really. I mean you have what
9 you have to modify. You have chemical
10 clearance and you've got mechanical clearance.
11 And when you start modifying those parameters
12 you need to fit -- fit -- you know, you have to
13 fit what's coming out of the lung somehow.

14 **MR. GRIFFON:** Right. Right.

15 **DR. NETON:** And as I suggested, almost shutting
16 down the chemical clearance totally still allow
17 for too much lung clearance so clearly there
18 was a mechanical component involved. But Roger
19 could speak for what selection criteria we used
20 for fit as a subject expert.

21 **MR. FALK:** It was mainly the -- it was mainly
22 the empirical type of the approach, and using
23 the principle that I want to look at the ones
24 that make the most changes and I want to make
25 as few of changes as I can. And so we've

1 looked at the particle clearance. I first fit
2 the lung data to -- to -- to get the
3 approximately fit and then I used the
4 absorption parameters to then -- then fit the -
5 - then fit the urine data in order to get the
6 same intake assessed by the IMBA code for both
7 sets of data independently. So that was my
8 basic approach.

9 **MR. GRIFFON:** Okay. The only thing I'm
10 wondering is, you know, if you then went back
11 and said, okay, for all these parameters if I
12 had (unintelligible) and I know that's not what
13 we're doing here but if you had to come up with
14 a constant for a, you know, a super S model
15 then, you know, these -- these numbers -- I
16 only see two of them but I'm guessing that they
17 -- that these parameters don't fall all over
18 the place.

19 **DR. NETON:** I'm not sure where you're -- you're
20 getting at there, Mark, but I -- I think -- I
21 think what you're saying is that there's a lot
22 of variability among these cases and there are
23 and that's why we deliberately chose the ones
24 that had the longest clearance times. We're
25 not really developing a new super S model.

1 We're doing a bounding analysis is what I'd
2 like to call it. And -- And we're very
3 confident that it -- the model -- the lung
4 calculation adjustments are -- fairly represent
5 the upper limit of the clearance times that one
6 would experience with Rocky Flats workers
7 inhaling insoluble material.

8 **MR. GRIFFON:** Okay. That's as far as I'm going
9 to take that one. Thanks.

10 **DR. NETON:** Yeah. I think you might be --
11 might be a little more --

12 **MR. GRIFFON:** That's really what I'm looking at
13 is the variability question, yeah.

14 **DR. NETON:** And that's why we -- we -- we
15 prefer to call these bounding analyses just
16 because of that, that, you know, clearly we
17 have ten cases and there's -- there's
18 variability even among super S. And the
19 original thought could be, well, let's take the
20 -- the central estimate and put some
21 distributions about that and assign dose
22 clearance parameters to the work force. But we
23 weren't comfortable with that --

24 **MR. GRIFFON:** Right.

25 **DR. NETON:** -- because there -- there is still

1 a lot of unknowns so we said let's take the
2 ones that exhibit the longest clearance times,
3 in fact, the two that did, and use the most
4 conservative of those two in every step of the
5 way. So --

6 **MR. GRIFFON:** Okay.

7 **DR. NETON:** Getting back to the next point
8 though is that if you want to now estimate
9 intake, how much plutonium did the person
10 inhale at times zero, this analysis of course
11 doesn't tell you that if you -- if you start
12 from a urine sample. If you start from a lung
13 measurement it's okay because you -- you -- it
14 is what it is. Or if you start from an air
15 sample and you inhale, what's deposited is
16 deposited. If I want to now impute or infer a
17 lung measurement -- a lung intake based on a
18 urine sample we need to look again at the
19 differences in what's coming out in the urine
20 versus the super S versus the S. And again
21 since we are not saying that these -- this is
22 the definitive model we looked at the
23 difference in intake retention fractions at all
24 time periods post-intake that were projected by
25 these calculations, and determined that at --

1 at any point along the way for chronic intake
2 scenarios there is no more than a factor of
3 four difference projected in intake. That is I
4 think a urine sample at any time post-intake
5 using the super S calculation or the S, I will
6 infer no more than a factor of four difference
7 in intake. In some cases it's much closer than
8 that, and that's what's recorded in figure 1
9 where we compare the different clearances. In
10 fact we did the analysis for both HAN-1 and
11 Rocky Flats 872. It turns out that HAN-1
12 projects the largest difference in intake and -
13 - and you can't read it necessarily from the
14 graph but you'll have to trust me that's about
15 a factor -- it is a factor of four I think
16 rounded up from 2.9. So given that then, we
17 are proposing in this I'll call it a white
18 paper right now, in our approach to dose
19 reconstructions with super S, that we would
20 take any intake that was derived from a urine
21 sample that assumed type S and multiply it by a
22 factor of four at any point along the way. So
23 essentially we're adjusting upwards all intakes
24 by a factor of four to account for this
25 difference in -- in -- the lower amount of

1 uranium -- of plutonium appearing in the urine
2 over time. We did a similar analysis on acute
3 intake scenario and it turns out it can be
4 larger than a factor of four after about a year
5 but under any credible scenario that we feel we
6 would be evaluating we would be doing that
7 acute intake analysis much closer in than --
8 than -- than a year. And again the factor of
9 four seems to apply pretty nicely for that
10 analysis. And that's what's plotted in figure
11 2.

12 **DR. MAKHIJANI:** Can I ask a question about that
13 time frame?

14 **DR. NETON:** Yeah.

15 **DR. MAKHIJANI:** In the petition it cites an
16 example if I remember correctly where an acute
17 intake was detected much after the intake only
18 on routine analysis. And so I wonder whether
19 you can make that assumption?

20 **DR. NETON:** How much -- How much after I
21 guess?

22 **DR. MAKHIJANI:** I think it was like a -- it was
23 actually on the order of a year. Is there a
24 petitioner? I can look it up. I've got it in
25 my notes somewhere but --

1 **DR. NETON:** Well, I think that if we know -- if
2 we know the specifics of the case we would
3 apply what the specifics were. But if you --
4 if you do the analysis, and Dave Allen can back
5 me up on this, if one assumes -- if one has a
6 positive urine sample, and let's say that that
7 positive urine sample is taken well -- a year
8 or more after -- and it was an acute intake, I
9 mean we would model it as a chronic intake
10 exposure scenario. That is giving a person
11 chronic intake all the way up to there. We
12 would -- we would bound his -- his dose using
13 that analysis. That's typically our approach.
14 We --

15 **DR. MAKHIJANI:** Yes.

16 **DR. NETON:** We've been down this path at the
17 other meetings where we've shown that chronic
18 intake scenarios are more claimant favorable by
19 and large than the acute intake.

20 **DR. MAKHIJANI** Yeah. Generally we have --
21 we've done this. I think we did this in --

22 **DR. NETON:** I forget where it was but we did --
23 we've done that. Am I pretty much on target
24 with that, Dave?

25 **MR. ALLEN:** Yes, we are.

1 **DR. NETON:** So --

2 **MR. ALLEN:** Assuming that -- that chronic
3 exposure doesn't stop the day of the sample.

4 **MR. GRIFFON:** Can't hear a word you're saying.

5 **MR. ALLEN:** I'm sorry. I'm back from the table
6 a little bit. It's assuming that the -- it's
7 assuming that the chronic intake doesn't stop
8 the day of the sample. If we're collecting a
9 sample that turns out to be high and it's a
10 year after an acute intake the odds are we're
11 not going to realize there was an acute intake.
12 We're going to (unintelligible) his on past
13 that date and this ends up being favorable to
14 (unintelligible) a short time after that date.

15 **DR. NETON:** Okay. So let us talk a little bit
16 about the different scenarios that one can
17 envision. For the lung if we estimated the
18 lung intake we would just apply that factor
19 four and -- and use that. If it were a GI
20 tract dose we were trying to estimate we would
21 again increase by a factor of four. You would
22 have the -- a lot -- it turns out a lot of the
23 GI tract doses (unintelligible) a clearance
24 from what is called ET 1 and ET 2, the extra
25 thoracic regions of the lung that this factor

1 of four would boost up and provide a fairly
2 large GI tract dose. We would clear that
3 factor of four dose to the GI tract with type S
4 parameters. In other words, we wouldn't -- we
5 wouldn't allow for this lower clearance. We
6 would just clear it out. And it wouldn't make
7 a huge difference I don't think because most of
8 the dose comes -- the majority of the dose
9 comes from the early clearance of not the lung
10 but the thoracic regions. When we're talking
11 about systemic organs though, those that have
12 to become irradiated after the plutoniums reach
13 the blood streams, we have a slightly different
14 approach here. It is our opinion -- it was at
15 the last Board meeting and it's still our
16 opinion that the -- the amount of material
17 that's in the blood stream is directly
18 proportional to the dose that's delivered to
19 the organ. So we would clear the material from
20 the -- from the lung we would use a type S
21 model. While -- Up to the date of the last
22 bioassay sample we were applying a type S model
23 to clear all the plutonium out of the lung and
24 then after the last bioassay sample there's a
25 problem because you have this potential

1 reservoir of additional plutonium that you
2 don't know about. And so then we proposed
3 after the person left the workforce and was no
4 longer monitored to increase those values by a
5 factor of four to account for this residual
6 reservoir. I think this is where we had a
7 slight disconnect at the last meeting. You do
8 get a higher dose because you certainly have a
9 higher intake but the dose during the
10 monitoring period itself is the -- I mean you
11 only have so much plutonium you can have in the
12 urine given a certain bioassay profile. So
13 that does a slight twist there with the
14 systemic organs so I've covered lung, GI tract,
15 ET 1, ET 2 and systemic organs. I think that
16 covers the waterfront on -- on those -- on
17 those types of calculations. We went an
18 additional step further and I mentioned at the
19 last meeting, we had the Transuranic Registry
20 cases. It turns out these comparisons were
21 more difficult than we would like and -- and it
22 -- for many of the same reasons that Roger
23 mentioned we've tried to obtain clean cases,
24 cases that were not confused by repeated
25 exposures or they had a high enough -- a

1 sufficient intake to be detectible above the
2 noise because if you -- if all of your bioassay
3 samples in the Transuranic Registry case are
4 below detectible it doesn't do you any good.
5 You need to have some positives in there to be
6 able to -- to do some comparisons. Nonetheless
7 we went ahead and did a comparison of what was
8 available and that was provided at the very end
9 of the document, sort of as what I like to call
10 an independent plausibility evaluation. In
11 other words, you know, we've -- we've made a
12 couple conservative assumptions at several
13 steps along the way. Does this put us in the
14 realm of -- of -- of -- of ridiculous? Are we
15 way overestimating? It turns out we do
16 overestimate but the factors where inhalations
17 were involved were not really out of the -- the
18 realm of plausibilities. And in fact this
19 analysis that we've done is shown for the --
20 how many there were --

21 **UNIDENTIFIED:** It's -- It's --

22 **DR. NETON:** Table 2.

23 **UNIDENTIFIED:** Table 2, last page, 8?

24 **DR. NETON:** Yeah. There were seven cases we
25 were able to compare. The techniques that --

1 adjustment factors, techniques that I just
2 described would be overestimates if we applied
3 them to the Transuranic Registry cases in the
4 manner that we would normally reconstruct a --
5 a intake. That is, assume a chronic intake
6 exposure scenario for the duration of their
7 employment. That's the nickel tour of where
8 we're at. Certainly I'm sure you folks have a
9 lot of questions they want to ask. Let's open
10 up the floor.

11 **DR. MAURO:** I'll start off with probably a dumb
12 question. When I look at figure 1 on your
13 report, let's just -- let's say I want to use
14 figure 1.

15 **DR. NETON:** Uh-huh.

16 **DR. MAURO:** I have an individual and what we're
17 saying is he's -- he's chronically exposed and
18 I go in -- I go in at one year, you know, 365
19 days which collapses you right up close, and
20 then pull a urine sample. Okay. And I don't --
21 I don't have any idea whether he was exposed
22 to high fired type S, N, or F. Just don't
23 know. But I suspect he's -- he's chronically
24 exposed to plutonium. Now, according to this
25 set of graphs what -- what this is if I assume

1 that this chronic exposure is type S, I'm going
2 to come up with my highest intake per unit
3 excretion. In other words, whatever you
4 observe in his urine, whether you assume and
5 say one-half of the MDL or at some detected
6 level, the intake that you're going to -- the
7 chronic intake rate is going to always be
8 bounded by assuming that he's being exposed to
9 type S. That is --

10 **DR. NETON:** Type S times four.

11 **DR. MAURO:** So this table includes the four.

12 **DR. NETON:** That's what I don't know if you can
13 probably see the graphic because it's -- we do
14 that in black and white copy but --

15 **DR. MAURO:** No, no, I have a colored copy.

16 **DR. NETON:** It's on the right. It's the third
17 one down which is the --

18 **DR. MAURO:** Oh, I -- Yeah. I'm sorry.

19 **DR. NETON:** -- gold line.

20 **DR. MAURO:** I -- I -- you're absolutely right.

21 **DR. NETON:** So what we're trying to show here
22 is type S which is the green line, would
23 project that.

24 **DR. MAURO:** I was looking -- I was looking at
25 the type S, not the --

1 **DR. NETON:** What was very nice about the --

2 **DR. MAURO:** As I said, it was probably going to
3 be a stupid question, and it was. Now at least
4 I understand.

5 **DR. NETON:** That was our intent to, you know,
6 we're not extremely confident in all aspects of
7 this model so we'll just take the factor of
8 four and apply it for all times post-intake
9 which we think works out very well for us.

10 **MS. MUNN:** You're certainly generous. It's
11 bounding from the graph.

12 **DR. NETON:** Any additional questions?

13 **DR. MAKHIJANI:** Let me -- let me -- I -- I
14 think the -- the comparisons of the S -- super
15 -- and super S (unintelligible) studied it a
16 great deal sort of correspond to some of the
17 analyses that -- that back of the envelope or
18 preliminary work that we did but the question
19 that I have in regard -- there's a -- there's a
20 question in the petition about mixed intakes.
21 So if you have type F, type M, type S, super S,
22 how do you actually -- that would be a
23 practical situation for a worker and there's a
24 explicit item in the petition claiming that it
25 would be hard to do that back or difficult to

1 do it or possibly to do it. And -- And just
2 to make the question a little bit more
3 simplified in my own mind, I pos-- I postulate
4 suppose you -- you're into routine bioassay.
5 We have an acute intake and you do a bioassay
6 six months or one year after the intake and it
7 is type F material. How would the systemic
8 organ doses compare because if you --
9 especially if you have below minimum detectible
10 -- say you have just below minimum detectible -
11 - you have just below MDA after six months or a
12 year your intake from type S would be quite
13 high, higher than possibly the real -- maybe
14 the type F. I do not know because it was very
15 short (unintelligible).

16 **DR. NETON:** Yeah. Yeah. Well, Dave, do you
17 want to --

18 **MR. ALLEN:** Well, the whole intent -- I mean
19 what we've been doing all along is taking all
20 the credible probability types and taking, you
21 know -- taking the most claimant favorable
22 ones. And what we're proposing with the super
23 S's is just one more -- one additional credible
24 solubility thing. So if type F is credible,
25 which it's -- it's not a default with the

1 plutonium -- we've done type M --

2 **MS. MELO:** (Unintelligible).

3 **DR. WADE:** Dave -- Maybe you can come up here,
4 Dave, and join us at the table.

5 **MR. ALLEN:** Sorry. Yeah. I'll just begin
6 again. What we've done in the past is taken
7 all the credible solubility types and assumed
8 the worst case one. In the case of plutonium
9 what we're proposing is that this super S would
10 be an additional solubility code so we would
11 run it as a super S, a type S and a type M and
12 pick the most favorable if they're all
13 credible.

14 **DR. MAKHIJANI:** So the like plutonium
15 trifluoride and tetrafluoride and so on? I
16 mean I -- I don't know all the chemical forms
17 that are there at Rocky Flats. I haven't made
18 a list but -- but you made a list and excluded
19 type F?

20 **MR. ALLEN:** Well, ICRP excluded type F for
21 plutonium.

22 **DR. MAKHIJANI:** Altogether?

23 **MR. ALLEN:** Yes.

24 **MS. MUNN:** Arjun, question about the case that
25 you mentioned in the SEC. I don't remember.

1 everyone hear?

2 **DR. WADE:** Can you hear me now?

3 **MR. GRIFFON:** Yeah, I can.

4 **DR. WADE:** Okay. We'll start back again.

5 Please, also before that happened someone was
6 obviously fiddling with something on their desk
7 or something mechanical and we could hear each
8 noise. So if you're going to be on the
9 speakerphone then mute us, please, and respect
10 everyone else's ability to participate.

11 (Phone recording plays)

12 **DR. WADE:** Okay. We're going to try and
13 continue our business. Again, we ask everybody
14 out there to sort of police your actions
15 respectfully. Otherwise we won't be able to
16 have these kinds of calls and I think a great
17 deal of important work will be left undone. So
18 we'll start again.

19 **MS. MUNN:** I hate to continue because Arjun's
20 not in the room but perhaps someone else can
21 answer the question. If we're not -- are we --
22 are we just speaking in generalities here? No
23 -- No one is suggesting that there is a
24 circumstance where there would be an acute
25 intake of all these different types of

1 solubilities. They're talking about the
2 possibility of individuals changing jobs or
3 handling different types of material over the
4 course of a period of years; is that the issue?

5 **DR. NETON:** I think so but --

6 **MR. GRIFFON:** (Unintelligible).

7 **DR. NETON:** Either way though I think that as
8 Dave Allen pointed out, we -- it's been our
9 standard practice to evaluate the plausible
10 scenarios and pick the one that would provide -
11 - if we couldn't tell, differentiate among the
12 exposure types, pick the one that would result
13 in the highest dose to the organ. So, you
14 know, if there was a mixture of 50/50 and we
15 assumed it was all one type that would be the
16 type that would give us the highest dose to the
17 organ.

18 **MR. GRIFFON:** So -- So Jim, I guess the
19 question relevant to super S would be is there
20 -- and I don't know if there's enough of a
21 handle as to where this may have been an issue
22 -- where you can determine from the urinalysis
23 whether it may be extension (unintelligible)
24 urinalysis that you have, you know, a lot of
25 your numbers, say for example super S exposures

1 that you're not aware of; do you know what I
2 mean?

3 **DR. NETON:** Right. And the way we've done our
4 adjustment factors we would apply a factor of
5 four intake above the S and evaluate the dose
6 to the organs. We -- We --

7 **MR. GRIFFON:** For any case that you were --

8 **DR. NETON:** That's right.

9 **MR. GRIFFON:** Okay.

10 **DR. NETON:** We would -- We would --

11 **MR. GRIFFON:** And you have enough -- you have
12 enough handle that you could narrow it down
13 (unintelligible) super S was an issue at Rocky
14 or -- or would it be done across the board or
15 I'm not --

16 **DR. NETON:** Well, it would be pretty much
17 across the board on handled plutonium. I mean
18 there were early assertions that this was just
19 related to the fire but there are other
20 indications that other types of plutonium may
21 be equally insoluble so this would be pretty
22 much handled across the board if we didn't know
23 any better. I mean if we knew the exact type
24 we would assign them but if we don't know,
25 super S would become one of our -- one of our -

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MR. ALLEN: Plausible classes.

DR. NETON: -- plausible classes, right. So --
And what you're talking about here as I -- as I
discussed previously, you're increasing the one
dose by quite a bit but the lung -- most of the
lung cancers are already compensated so that
really is -- I mean there are some that are on
the borderline that might fall in under this
new approach which is why we went that way, but
then even when you increased the intakes by a
factor of four the systemic organ doses that
don't concentrate plutonium still don't get any
internal dose to an appreciable degree because
they just don't concentrate the material.

MS. MUNN: Yeah.

DR. NETON: So -- And we will -- we will
document this with some example dose
reconstructions I think. This would be a
perfect case where we would show that you --
even with these factor of four adjustments you
end up with plausible doses to the individual
organs and, you know, which ones would be
likely compensable under certain scenarios,
that sort of thing.

1 **MS. MUNN:** And that continues to be a concern,
2 how far outside of plausibility --

3 **DR. NETON:** Right.

4 **MS. MUNN:** -- do you get when you start adding
5 factors of four.

6 **DR. NETON:** Right. But with super S I, you
7 know, I feel we're -- we're -- we're not
8 implausible. I think that clearly there are
9 cases where this stuff just doesn't move out --
10 out of the lung.

11 **MS. MUNN:** No, the graph shows that.

12 **DR. NETON:** The trick is when you get these
13 factor of four differences in intakes and then,
14 you know, you have to account for that in the
15 systemic organs. And that's what we're going
16 to do. I mean that's what we'll account for
17 after the last bioassay sample.

18 **MR. GRIFFON:** Can I just go back to one more
19 question on that, the clean cases question.
20 How many -- how many people were involved in
21 these fires or what was the (unintelligible)
22 data that you looked at or -- or Roger looked
23 at to identify the clean cases that you were
24 going to use in this model?

25 **DR. NETON:** Roger?

1 **MR. FALK:** That's hard to qualify. Basically
2 for the 1969 fire there are about 200 people
3 who were in the building who were -- who were
4 carded after that. Now -- Now -- Now, there
5 were only 25 cases that were noted to be over
6 the one lung burden range at that time. And so
7 -- but there is a whole spectrum of the cases.
8 And one wants to look at the highest cases that
9 have the best good long-term data that we can.

10 **MR. GRIFFON:** Okay.

11 **DR. GLOVER:** And then these were compared to
12 over 120 Rocky Flats USDR cases as well to kind
13 of verify the -- the plausibility of the -- of
14 the scenario. We had people who were exposed
15 in the 1969 fire, two later fires, to a variety
16 of scenarios where this potentially could be
17 applicable.

18 **MR. GRIFFON:** How many USDR cases?

19 **DR. GLOVER:** A hundred and twenty autopsy cases
20 have been done for Rocky Flats.

21 **MS. MUNN:** That's good. That's a good sample.

22 **MS. MELO:** And I (unintelligible) parameters
23 (unintelligible).

24 **DR. WADE:** We're having great difficulty
25 hearing you.

1 **DR. GLOVER:** I think I caught her. We had
2 already answered that earlier. We did try
3 doing that, just changing the absorption
4 parameters and the mechanical clearance was too
5 fast. It -- It lowered the lung content
6 faster than what the --

7 **MR. GRIFFON:** (Unintelligible).

8 **DR. GLOVER:** -- were shown.

9 **MS. MELO:** (Unintelligible).

10 **DR. GLOVER:** I didn't catch that.

11 **DR. WADE:** Well, you have to speak louder and
12 if you have a handset, please use the handset.

13 **MS. MELO:** Yes. (Unintelligible) transport
14 (unintelligible).

15 **DR. GLOVER:** Mechanical transport --

16 **MR. GRIFFON:** (Unintelligible) data you have to
17 (unintelligible) as well, right?

18 **DR. NETON:** Right.

19 **DR. GLOVER:** Right.

20 **DR. NETON:** It was necessary to change the
21 mechanical transport to account for the overall
22 slower clearance.

23 **DR. MAURO:** Is that what that ten to the amount
24 of six per day is? In other words, that number
25 is the number you have to sort of get into your

1 model in order to allow it to do what you
2 wanted it to do based on the empirical data to
3 get -- in other words it was ten to the amount
4 of six per day.

5 **DR. NETON:** I think that's the chemical
6 solubility.

7 **MR. FALK:** No, that is the particle transport
8 from the AI3 region.

9 **DR. MAURO:** Okay.

10 **MR. FALK:** And we had to basically stop I
11 thought.

12 **DR. MAURO:** You had to shut that --

13 **MR. FALK:** Yes.

14 **DR. MAURO:** -- dramatically. In the end what
15 is the end, the clearance rate?

16 **MR. FALK:** It doesn't seem like there is much.

17 **DR. MAURO:** In other words, for all intents and
18 purposes it's sealed. In other words, frozen.
19 And -- And when you do that --

20 **DR. NETON:** I also have zeros down because we
21 -- we couldn't have anything in the
22 (unintelligible).

23 **DR. MAURO:** No, no. Everybody's --

24 **DR. NETON:** You can't have it both ways.

25 **DR. MAURO:** Well, no, no. In other words,

1 mech-- here -- here we have a daily intake for
2 unit exclusion. Okay. And embedded in that is
3 some clearance model. Now, if you were to
4 assume that your -- you take a urine sample.
5 You see -- You don't see anything. You don't
6 see anything because nothing is there. Okay.
7 But you say, well, wait a minute. We don't see
8 anything. We're going to assume it's one half
9 the MDL or the MDL, whatever. You're going to
10 pick a number. Then you're going to say if
11 that -- now, we realize that these two things
12 can't happen at the same time but assuming it's
13 at one half the MDL but -- let me try -- this
14 doesn't -- see if this makes sense or not --
15 then you'll come up with an intake that's based
16 on your graph here that tells you how much is
17 taken in. Okay. Now I have my intake rate and
18 I have my becquerels per day coming in now.
19 Then I go ahead and I run a calculation. If I
20 have these becquerels per day coming in and I
21 assume it all -- none of it's leaving -- now we
22 assume that none of it's leaving. Of course
23 the two are -- does -- does that change your
24 dosing? In other words, for all intents and
25 purposes is that what you're doing? Did I pose

1 my question the way that -- in other words, you
2 come up with an intake based on your -- your
3 model on figure one.

4 **DR. NETON:** Right.

5 **DR. MAURO:** And now I have my intake. Now I'm
6 going to -- now, what you're saying is I'm
7 going to calculate my dose right now to the
8 lung by assuming that the clearance -- that the
9 -- it's four time -- I guess the clearance rate
10 is -- what -- your intake is as if it was four
11 times S.

12 **DR. NETON:** Right.

13 **DR. MAURO:** Now you've got your -- you have
14 your intake. I have my -- I have my
15 becquerels per day. Now I'm going to calculate
16 the dose to the lung. Now, embedding that dose
17 to the -- the lung is some assumptions is how
18 quickly it's being cleared. Now, if I assume
19 that it's not being -- it isn't, whatever I
20 assume is my intake rate, is this staying
21 resident permanently in the lung?

22 **DR. NETON:** Well, that's not what we're doing.

23 **DR. MAURO:** No, no, I want to see if that --
24 because that sort of like puts a point at the
25 end of the sentence. It can't be worse than

1 any? For all intents and purposes that's what
2 we have. First of all, does my question make
3 sense? Do you understand where I'm going with
4 my question or -- or am I missing the point in
5 a way? See, I'm trying to say that maybe --
6 maybe you've picked a case for all intents and
7 purposes that can't be any worse than that.

8 **DR. NETON:** I think that's what we're
9 suggesting is that we've looked at ten
10 individual cases with fairly high exposures
11 where we had good data and we picked the worst
12 two cases of that which were very similar.
13 Now, you know, do we have all possible exposure
14 scenarios covered? I don't know.

15 **DR. MAURO:** Well, what I'm saying is that --
16 and if it turns out that for all intents and
17 purposes from the point of the lung dose it
18 doesn't really matter because you're assuming
19 for all intents and purposes it's not leaving
20 the lung so it can't be any worse than that.
21 In other words, I'm trying to --

22 **DR. NETON:** That's not necessarily true.

23 **DR. MAURO:** -- close here. That's not -- Okay.

24 **DR. NETON:** There is -- it's not going very
25 fast but it is clearing, I mean to some degree.

1 I mean the doses, it's -- it's close to not
2 clearing but again if it didn't clear from the
3 -- the lung at all we wouldn't be able to
4 measure it in the urine.

5 **DR. MAURO:** Oh, I understand.

6 **DR. NETON:** And in fact if it didn't clear from
7 the lung at all there'd be no dose to the
8 systemic organs.

9 **DR. MAURO:** What I'm saying is that for most of
10 our cases we're going to have cases where we
11 don't see anything in urine. We -- We know
12 that.

13 **DR. NETON:** But we're going to assume, like we
14 do with normal missed dose calculations --

15 **DR. MAURO:** Right.

16 **DR. NETON:** -- that it's LOD over two.

17 **DR. MAURO:** Right. That's right.

18 **DR. NETON:** And then we'll multiply those
19 intakes, if they were S times a factor of four
20 --

21 **DR. MAURO:** Right.

22 **DR. NETON:** And say, you know, we're not sure
23 exactly what it is but based on the bounding
24 analysis we've done with the ten cases --

25 **DR. ULSH:** And you also have to keep in --

1 sorry, go ahead.

2 **DR. NETON:** And I was just (unintelligible) if
3 you look at the ten design cases it's a log
4 scale. There -- There's a pretty substantial
5 gap between the third highest case and -- and
6 the two that we've chosen. I mean that's not a
7 trivial difference. So, yeah, I think it's a
8 fairly representative sample -- representative
9 sample of these -- of these exposures.

10 **DR. ULSH:** You also have to keep in mind we're
11 talking about urine data here but we also have
12 lung count data and that's the piece that we
13 haven't really talked about explicitly here. I
14 think if you could get a handle on could there
15 be cases where there's even slower clearance
16 than what we've estimated and we don't see that
17 from the lung count data; is that correct, Jim?

18 **DR. NETON:** Well, I mean that's what it shows
19 here, I mean with the design cases. I think
20 there's also this effect that we've talked
21 about where there -- there are some people
22 postulate that the higher exposures actually
23 clear more slowly because of the damage that's
24 done to the lungs just from the --

25 **DR. MAURO:** Yeah.

1 **DR. NETON:** -- alpha fibrotic lesions that are
2 created because of the high activity. So in
3 some sense if that were true then this would
4 certainly be -- would even emphasize more the
5 fact that they are more likely bounding
6 analyses. I can't prove that but that would
7 support that contention.

8 **DR. GLOVER:** One piece of evidence, to -- to
9 say that it never clears, even thorium dioxide
10 has self-inflicted damage sites that breaks
11 (unintelligible). So even these -- there will
12 be some self-induced damage. Even -- Well,
13 it's not Pu 238 but so to support the slow
14 clearance, yes, it's sticking but there are --
15 it is going to become chemically more soluble,
16 a little bit over time. It's not like
17 plutonium 238 which (unintelligible). But
18 there are damage -- there is damage occurring.
19 It just doesn't sit there.

20 **DR. MAKHIJANI:** I had a -- sorry. I had a
21 question about figure 3 in your approach dose
22 reconstruction, page 5.

23 **MS. MUNN:** I don't see 3.

24 **DR. MAKHIJANI:** I had a question about figure
25 3, page 5. And I see that Hanford 1 curve

1 crosses the four types --

2 **DR. NETON:** Right.

3 **DR. MAKHIJANI:** -- in less than a year.

4 **DR. NETON:** Right. That's what I -- I talked
5 about earlier, that when you approach a year
6 the factor can be slightly higher than four.
7 We believe in those scenarios we would be
8 assigning a chronic intake scenario anyways if
9 it were not a known incident. But we would
10 monitor that as a chronic exposure.

11 **DR. MAKHIJANI:** Okay. I didn't relate our
12 discussion to that figure. Sorry.

13 **DR. WADE:** Okay. Are we ready to move on?

14 **MS. MUNN:** I believe so.

15 **DR. WADE:** Maybe just a brief sort of reminder.
16 Don't put a call on hold. Don't do anything
17 unusual with this. Please keep your phone
18 muted if possible. And let's continue.

19 **SUPER S**

20 **DR. ULSH:** Before we leave this issue I'd like
21 to ask all the members of the working group and
22 Mark in particular, where are we with this
23 super S issue now? I mean the action item on
24 the matrix was that we would provide -- NIOSH
25 would provide to SC&A and the Board TIB 49 and

1 supporting data. We have done that. What goes
2 in the matrix now in terms of what's the next
3 action?

4 **SAMPLE DR'S**

5 **MR. GRIFFON:** Right. I think -- I think the
6 action is -- is that sample DR's is -- is what
7 we're down to now I think.

8 **DR. ULSH:** Okay.

9 **MR. GRIFFON:** And that should come through the
10 evaluation process I believe, through your
11 evaluation report or in association with the
12 evaluation report.

13 **DR. NETON:** Right. It would be a supplement to
14 the evaluation report.

15 **MR. GRIFFON:** Yes. Right. But I think you
16 satisfied the action here except for the
17 partial DR's --

18 **DR. ULSH:** Okay.

19 **MR. GRIFFON:** -- listed parenthetically there.

20 **DR. ULSH:** Okay. Thanks.

21 **MR. GRIFFON:** Can I ask one more thing, one
22 more follow-up on this item? I was going to
23 ask before and my phone went dead and I had to
24 transfer to another phone but Roger, you
25 mentioned the 200 people in the building, 25

1 cases with the significant lung burden I guess.
2 Is there a write-up on the follow-up of all
3 these cases or is there any kind of write-up?

4 **MR. FALK:** There were papers published in the
5 first year or two but there has been no paper
6 to my knowledge that has been -- that has been
7 written describing the long-term follow-up.

8 **MR. GRIFFON:** Is that -- Is that paper on the
9 O drive or available or has that been
10 (unintelligible)?

11 **MR. FALK:** It is part of the O drive
12 documentation.

13 **MR. GRIFFON:** It is a part of (unintelligible)?
14 Okay. Anyone -- Lew, you wanted to say
15 something?

16 **DR. WADE:** Well, I was just saying that the
17 sample dose reconstruction will not be provided
18 as part of a supplement. There will -- There
19 will be information provided in addition to the
20 (unintelligible).

21 **DR. NETON:** Supplemental to --

22 **DR. WADE:** Right. But not as a supplement.

23 **DR. NETON:** -- but not as a supplement.

24 **DR. WADE:** Which has a formal meaning.

25 **MR. GRIFFON:** Yes.

1 **DR. WADE:** Thank you.

2 **MS. MUNN:** So, Mark, I'm looking at all the
3 actions under comment number 2, and with the
4 exception of the DR's it looks like they're
5 covered; am I correct?

6 **MR. GRIFFON:** Yeah, I think so. 1B -- we've
7 discussed all these items, 1B and 1C, correct?

8 **MS. MUNN:** Right. Yeah.

9 **MR. GRIFFON:** So yes, I agree except for the
10 sample DR's unless anyone has any other
11 comments there. I think that's all of this.

12 **COMMENT 4**

13 **MS. MUNN:** That takes us to item 4.

14 **MR. GRIFFON:** Yup.

15 **MS. MUNN:** Comment 4.

16 **DR. ULSH:** Okay. I'd like to -- this is Brant.
17 I'd like to direct your attention to the first
18 handout that I provided which is the 27
19 February Matrix Issues and NIOSH Responses.
20 And if you look at page 2 of that document
21 you'll see a reiteration of the comment. The
22 action item here is that NIOSH will provide the
23 data and supporting references to support the
24 assertions regarding the practices for
25 adjusting plutonium, isotopic -- isotopic

1 ratios and americium in-growth. If you recall,
2 we talked about this at the Boston Board
3 meeting and the question came up -- I think
4 Arjun asked the question about what happens
5 when you start with aged plutonium from which
6 the plutonium 241 has been removed and you
7 might not expect any americium in-growth. All
8 right. And Roger at that time stated that in
9 fact at Rocky Flats the old -- the aged
10 plutonium was blended with new plutonium. And
11 so the action item is that we would provide
12 documentation of that. We've done two things.
13 The first, we've contacted three long-term
14 former Rocky Flats workers and they're --
15 they're listed here in the second paragraph of
16 the response. The consensus was that blending
17 did occur and it was part of the routine
18 process. A second track that we have pursued
19 is that you'll see on page -- pages 3 and 4
20 there is a graphic here. This is a document
21 that we have located. Page 3 is not really
22 that informative. I included it for
23 completeness. But if you look at page 4
24 there's a couple of points I want to make from
25 this document. If you look at the very bottom

1 the first thing -- the first point I want to
2 make, there's a list of plutonium isotopes and
3 you see the weight percent for each of the
4 isotopes. And what you see there for plutonium
5 241 the weight percent is .3684 percent. And
6 that essential -- this document is from 1987 if
7 I'm --

8 **MS. MUNN:** Yes, '85 through '87.

9 **DR. ULSH:** Yes. And that matches pretty well
10 with the plutonium 241 isotopic ratio that you
11 observe in the Rocky Flats environmental impact
12 statement from 1976 to '78 which was about .36.
13 So that that demonstrates is that over that
14 time period the isotopic ratio was stable. So
15 I think that that answers that concern. The
16 other thing to note --

17 **DR. MAKHIJANI:** Before you leave that, Brant,
18 could I ask a question about that EIS?

19 **DR. ULSH:** Yeah.

20 **DR. MAKHIJANI:** Was the EIS based on -- on
21 current measurements like this 1987 document or
22 how was it prepared?

23 **DR. ULSH:** I'm going to defer to Roger on -- on
24 that.

25 **MR. FALK:** I was not in the loop for that but I

1 am presuming that it was from the material
2 control documentation for the site. But --
3 But I do not know that for a fact.

4 **DR. MAKHIJANI:** Because just -- just, you know,
5 for the record, EIS has contained a variety of
6 types of information, some more reliable and
7 some less reliable in my experience. And --
8 And I think this is a pretty big conclusion to
9 base -- this document that you -- from 1987
10 seems to be pretty clear where the -- when the
11 measurements were made so one -- it -- it -- it
12 seems clear that they were made on contemporary
13 measurements. But since you need that other
14 point I would have less confidence of this time
15 without some -- some evidence that they were
16 contemporary in these measurements.

17 **MR. LANGSTED:** Yeah, the -- in the 1980 EIS the
18 -- the weapons mix was a fairly classified
19 piece of information all through those years.
20 And to declassify that I believe they took a
21 average over a three or four-year period and it
22 was I believe '70 -- mid-'70s to late '70s.
23 And that number was published in the EIS and is
24 referenced and that was the -- that was the
25 number that this is based on --

1 **DR. MAKHIJANI:** Okay.

2 **MR. LANGSTED:** -- for that early period.

3 **DR. MAKHIJANI:** Which would be okay if it were
4 from that period.

5 **DR. GLOVER:** One of the other items is that the
6 Rocky Flats autopsy data tracks very well with
7 the unbroken curves when you compare at the
8 time of autopsy what the plutonium -- the
9 americium 241 to plutonium ratios are. They do
10 a very nice job of predicting the age of the
11 plutonium and --

12 **DR. MAKHIJANI:** Starting with this .36 percent?

13 **DR. GLOVER:** If you used the Rocky Flats
14 defaults.

15 **DR. MAURO:** So the autopsy data for the 123
16 cases --

17 **DR. GLOVER:** Some of them are low precision as
18 lung -- low activity. But the cases where you
19 have reasonable precision in the measurements
20 they do a good job of predicting.

21 **DR. MAURO:** So you didn't see any surprises
22 where it was just the plutonium 239 was there
23 without the 241 --

24 **DR. GLOVER:** That's correct.

25 **DR. MAURO:** -- or the americium?

1 **DR. ULSH:** Okay. So there's -- there's another
2 piece of supporting data.

3 **DR. MAURO:** I've got a related question. The -
4 - The urinalysis work that we were just
5 talking about and the approach that was laid
6 out, let's postulate that, yes, it's
7 bulletproof, works, solves the problem from
8 high fired plutonium, the implications being
9 that, okay, do we have -- do we -- I presume we
10 have urine data across the board from very
11 early continuing on workers?

12 **DR. ULSH:** Uh-huh. That's correct.

13 **DR. MAURO:** Do we need the chest count data?

14 **DR. ULSH:** Do we need it?

15 **DR. MAURO:** Yeah, if you've got the urine data.
16 In other words -- In other words, what I'm
17 hearing here is were the -- how many -- if you
18 can do it reliably and in a claimant favorable
19 way based on the model that you just developed
20 for high fired plutonium, you basically -- you
21 have your protocol. Then along comes the chest
22 count data. You're going to have that, too.
23 And now, we -- we -- we're discussing this
24 issue. You made your case that the problem
25 that we raised doesn't really exist. So --

1 But if it did -- but if it did exist, okay,
2 assuming that for some reason we say, oh, we
3 find something out later that says, no, no, no,
4 no. We -- We found -- We believe that there
5 are situations where we just have the -- the
6 plutonium there by itself. Does that problem
7 go away if in fact your urine approach, it
8 works?

9 **DR. GLOVER:** It does.

10 **DR. MAURO:** Okay.

11 **DR. GLOVER:** I mean we talked about that the
12 last --

13 **DR. MAURO:** Yeah, that's why I'm asking the
14 question.

15 **DR. GLOVER:** In fact I thought this item was
16 going to be annotated to essentially state --

17 **DR. MAURO:** To say -- I wanted to hear that.

18 **MR. GRIFFON:** I need closure on it, too.

19 **DR. MAURO:** Yeah, I wanted to hear that.

20 **DR. NETON:** And I think that's true. I mean
21 given all your assumptions and caveats --

22 **DR. MAURO:** I have a hard time with it.

23 **DR. ULSH:** The other point that I want to make
24 before we leave this document, the handout on
25 page 4 where it shows the plutonium isotopic

1 ratios per weight percents, there was some
2 discussion about whether or not the assumption
3 of 100 ppm americium was conservative. In
4 other words, is there -- I think John might
5 have asked, is there a plausible situation
6 where you might have a lower -- lower americium
7 content. And this document also provides some
8 information along those lines. If you look at
9 the top of page 4 there you see number 2, and
10 there are several bullets that follow. And
11 they describe the americium content at various
12 stages of the process, and nowhere is it lower
13 than 100 ppm. In most cases it's higher. So I
14 think that supports the value that we are using
15 in the TBD.

16 **MR. GRIFFON:** What page is that?

17 **DR. ULSH:** This is the handout, Mark, that --
18 the matrix issue responses, and this is on page
19 4. There's a graphic there of a document I
20 scanned in. And if you look at the bullets
21 there below the number 2 --

22 **MR. GRIFFON:** Yeah. Got it.

23 **DR. ULSH:** Yeah. So I think this lends some
24 credibility to the number that we're using in
25 the TBD, 100 ppm, unless we know differently.

1 **DR. MAKHIJANI:** Brant, in that -- in the second
2 bullet from the bottom?

3 **DR. ULSH:** The waste stream americium content?

4 **DR. MAKHIJANI:** Yeah. How -- How do you
5 handle that? Are the -- and maybe Roger can --
6 are the workers who were working with the waste
7 streams, is that in their records so that you
8 know they were working with americium
9 concentrated sludges and waste streams and
10 things?

11 **MR. FALK:** I really don't know that that is in
12 the workers' files.

13 **DR. MAKHIJANI:** So how do you handle the waste
14 stream workers?

15 **MR. FALK:** Would NIOSH like to answer that?

16 **DR. NETON:** I'm not sure what's the question.
17 I mean it certainly indicates there was
18 approximately 200 parts per million americium.

19 **DR. MAKHIJANI:** No, that's -- that's in the
20 plutonium stream. I think the question about
21 the in vivo counting of plutonium streams seems
22 to be answered --

23 **DR. NETON:** Oh, okay. The salt waste --

24 **DR. MAKHIJANI:** -- based on the --

25 **DR. NETON:** -- the parenthetical explanation.

1 **DR. MAKHIJANI:** And just looking at that
2 parenthetical remark, because I think this has
3 come up in some other context, is how do you --
4 how do you handle the dose reconstruction from
5 the -- from the workers who were involved with
6 the waste streams.

7 **MS. MUNN:** Well, if that information isn't in
8 the CATI, how do you know it?

9 **AMERICIUM 241**

10 **DR. ULSH:** I'm going to step out on a limb here
11 and ask Dave Allen to correct me if I stick my
12 foot in my mouth. What we are counting when we
13 do a chest count, or let's talk about the chest
14 counts, is the americium 241 gamma.

15 **MR. ALLEN:** Right.

16 **DR. ULSH:** If that was in fact not a result --

17 **MR. ALLEN:** We're counting the americium 241,
18 well, the -- the normal chest counting
19 technique at Rocky Flats and most places is
20 counting the americium 241 gamma and making
21 some correction there for how much plutonium
22 that -- that means. So using the 100 ppm
23 basically we assume that there's what, 1,000
24 times that amount -- amount of plutonium in the
25 lungs. So I'm not sure where you're getting

1 at. If it's a concentrated americium stream
2 and we're lung counting, we're going to be
3 overestimating the plutonium.

4 **DR. ULSH:** That's the point I was hoping to
5 make.

6 **DR. NETON:** But that -- But that begs the
7 question I guess, just for the completeness,
8 that we don't have lung counting data
9 throughout the operating history of Rocky
10 Flats.

11 **DR. MAKHIJANI:** Or data for americium.

12 **DR. NETON:** Classified in that, well, yeah.

13 **MS. MUNN:** Was this not a wet process? And how
14 --

15 **DR. NETON:** Salt stream, yeah.

16 **MS. MUNN:** How -- How would the worker be
17 ingesting these salts in any case?

18 **DR. NETON:** They were more than likely inhaling
19 I think. It would be difficult to inhale from
20 a wet waste stream.

21 **MS. MUNN:** Yeah.

22 **DR. ULSH:** Okay. I don't know if --

23 **DR. NETON:** I think that's just something we're
24 going to have to think of. It's a good
25 question and we need to -- we need to think

1 about that unless Roger has some insight he'd
2 like to share with us related to that process.

3 **MR. FALK:** Well, what we're talking about is
4 the molten salt operation and that started
5 probably late '60s, early '70s, so -- and so we
6 did have the lung counter there. And the
7 method of the lung counter is that there was a
8 possible inhalation situation. The ratio
9 monitors would get a sample of the
10 representative type of the material and we
11 would measure the parts per million in that
12 sample for each lung count case. So we have
13 that measurement and that is documented on
14 report in the claimants' files. So we -- So
15 there shouldn't be any real surprises there.
16 And then the comment -- the comment might also
17 pertain, well, now, what is the likelihood of
18 the exposure to the waste streams. And that
19 was fairly well contained but I don't know if -
20 - but I don't know if -- if there was no
21 possibility for that. But then that would have
22 been measured by a loss of the containment
23 also.

24 **MR. GRIFFON:** Roger, was there a predecessor to
25 the molten salt process that would have

1 resulted in -- in kind of waste stream, or no?

2 **MR. FALK:** There were americium type of
3 separations starting in the late '50s in
4 building 71 as part -- as part of the
5 purification process for the plutonium. And
6 yes, so there would have been that -- that
7 component which would branch off during the
8 chemical separation starting --

9 **MR. GRIFFON:** Then I think the issue might
10 still be on the table from that point.

11 **DR. ULSH:** Okay. I think -- I think we should
12 maybe mark that down as an action item --

13 **MR. GRIFFON:** Yeah.

14 **DR. ULSH:** -- that we can provide you some
15 follow-up on pretty quickly.

16 **MR. GRIFFON:** Follow up on the other. And I
17 agree with Jim earlier that, you know, we did
18 add to the (unintelligible). In other words,
19 you don't need that. But, you know, this 4 was
20 kind of an (unintelligible) on that, too. But
21 I think to the extent this part might be a site
22 profile issue but (unintelligible) americium is
23 should --

24 **DR. ULSH:** Okay. So we -- So we close out
25 matrix issue number 4, action item 1 and add a

1 new issue about americium?

2 **MR. GRIFFON:** Right.

3 **DR. ULSH:** Okay.

4 **MR. GRIFFON:** I think that sounds agreeable to
5 everyone.

6 **DR. NETON:** Yeah. I think this would be a
7 separate issue --

8 **MR. GRIFFON:** Yeah.

9 **DR. NETON:** -- other than 4. I mean it really
10 is not related to the lung count.

11 **MR. GRIFFON:** It's really not related. We can
12 have a new issue.

13 **DR. NETON:** It's essentially an americium
14 strain.

15 **MR. GRIFFON:** It's a new issue within the
16 matrix.

17 **MR. FITZGERALD:** Could someone restate the
18 issue just based on what --

19 **DR. ULSH:** I hope someone can. I don't know
20 that I'm the best person to restate it.

21 **DR. NETON:** I think the issue is that there are
22 -- there are time periods when the in vivo
23 counter was not operating where americium was
24 present in its purified form somewhere in the
25 facility. I think that's --

1 **MR. GRIFFON:** Yeah. How do you determine the
2 presence of americium in its purified form
3 prior to lung counting.

4 **DR. NETON:** Given that we have no americium
5 uranium urinalysis --

6 **MR. GRIFFON:** Right.

7 **DR. NETON:** -- or in vivo counting capabilities
8 so it would be before the 1960's time frame
9 where this would be relevant.

10 **DR. MAURO:** If you did have a person that was
11 exposed to the separated americium 241 and you
12 did a chest count and you -- would you also
13 assume that he, along with the americium the
14 plutonium was there also and there -- thereby
15 come up with some I guess unrealistic
16 overestimate? Is -- In other words, I'm
17 looking at -- or do you know when the person is
18 working solely with the separated americium and
19 therefore you know you're not dealing with this
20 -- that gray -- that gray area where you're
21 going to be tricked into thinking he's got a
22 very large plutonium burden?

23 **DR. NETON:** I think there was a pretty good
24 discussion by Roger earlier that we more than
25 likely know where this person was working.

1 **DR. MAURO:** Okay.

2 **DR. NETON:** Or especially if there were an
3 incident, if you were working in that area.

4 **MR. FALK:** Well, you would also have the
5 plutonium urine data too that would bound that.

6 **DR. MAURO:** Well, what I'm hearing -- I was --
7 you never see anything in the urine for
8 plutonium I mean.

9 **DR. ULSH:** If it's super S.

10 **DR. MAURO:** Or S -- even is my understanding.
11 Very often you don't see it.

12 **DR. ULSH:** Right.

13 **DR. NETON:** But we would assume a certain -- a
14 certain detection limit and apply it.

15 **DR. MAURO:** Apply it anyway? Okay. Okay.

16 **DR. ULSH:** The other thing to maybe think about
17 before we leave this issue, and Roger, maybe
18 you can chime in and correct me if I'm wrong.
19 But we did do gross alpha urinalysis in the
20 early years and I think that americium 241
21 would have been captured in that, correct?

22 **DR. NETON:** Yes.

23 **DR. ULSH:** So for the gross alpha measurements
24 I think we would assume the most claimant
25 favorable element for the dose reconstruction.

1 So this is a way to bound.

2 **DR. NETON:** Yeah, I think that's right. We
3 probably need to sit back and think about it.

4 **MR. GRIFFON:** Yeah, I think you might want to
5 sit back and think about it.

6 **DR. NETON:** I always find it somewhat dangerous
7 to start solving here.

8 **MS. MUNN:** Solving here.

9 **DR. ULSH:** That's why Jim has to reel me back
10 in when I start going out too far on a limb.

11 **MS. MUNN:** Just call it new issue 3.

12 **MR. GRIFFON:** Yeah, new issue 3. Back to issue
13 4 though, we -- are we done with that?

14 **MS. MUNN:** Looks like it to me. Everybody
15 happy where we are? I see nodding heads.

16 **DR. MAKHIJANI:** Yeah. Yeah. I think, yeah --
17 I can say we are.

18 **MR. GRIFFON:** Do you want to delve into issue 6
19 before lunch?

20 **UNIDENTIFIED:** I'm game.

21 **MR. GRIFFON:** All right.

22 **MS. MUNN:** Well, it's brief.

23 **DR. MAURO:** Everybody checked out? When is
24 checkout time by the way just to let everybody
25 know about it?

1 **MR. GRIFFON:** Brant?

2 **COMMENT 6, CALIBRATION**

3 **DR. ULSH:** Number 6, action item 1. The
4 question here dealt with the justification for
5 using the NTA film calibration factors for
6 brass track dosimeters in the NDRP. I think
7 this is discussed in one of the comments that
8 I've seen they have sent over in the past week;
9 is that correct?

10 **MR. FITZGERALD:** Yeah. The calibration issue.

11 **DR. ULSH:** Okay.

12 **MR. FITZGERALD:** That's correct.

13 **DR. ULSH:** Let me just get into it a little bit
14 here. In terms of the glass track plates,
15 these were conduct -- these were read by the
16 Los Alamos Scientific Laboratory, LASL, and
17 really there was never a question about the
18 integrity or the validity of those reads. The
19 NDRP was faced with a choice of whether to
20 include the glass track plates or not to
21 include them. They included them and applied
22 the NTA calibration factor which increased the
23 neutron dose estimates by a factor of about
24 2.3. Keep in mind though that the original
25 estimates from the glass track plates were not

1 in question. The NDRP just did this as a
2 claimant favorable moderate overestimate. We
3 don't believe that it would be worthwhile to go
4 back and back those out so that we could lower
5 the neutron doses. So that's our -- that's our
6 response. I don't know.

7 **MR. FITZGERALD:** Ron? Ron?

8 **MR. GRIFFON:** I'm not sure NDRP was addressing
9 the claims.

10 **UNIDENTIFIED:** Right.

11 **MR. FITZGERALD:** Ron Buchanan, are you on the
12 phone?

13 **MR. BUCHANAN:** Yes, I'm here.

14 **MR. FITZGERALD:** Did you hear -- Did you hear
15 the response?

16 **MR. BUCHANAN:** Yes. Now, the way I understand
17 it there was only 10 to 18 of those neutron
18 track plates used here prior to '55/'56. And
19 then -- then they started doing their own
20 (unintelligible) in '57/'58 time frame
21 (unintelligible); is that correct?

22 **DR. ULSH:** I'm going to -- I'm going to defer
23 to Roger on that.

24 **MR. FALK:** I believe that we successfully re-
25 read 692 of the glass plates ranging in years

1 from 1952 through January of 1957. And so that
2 is the scope of the glass plates. And the
3 difference between the original neutron dose
4 which was evaluated by Los Alamos versus our --
5 our re-read plus -- plus the film calibration
6 factor was as -- was as Brant stated a factor
7 of 2.3 higher than the original. So the
8 project had a choice. Do we go with the
9 original or do we apply the neutron film
10 calibration factor and get a overall higher --
11 higher neutron dose.

12 **DR. MAKHIJANI:** Okay. So what you're saying is
13 by applying the MDA calibration factor -- and
14 was that the reason that you came up with this
15 2.3 higher dose --

16 **MR. FALK:** That was --

17 **DR. MAKHIJANI:** -- than the calibration?

18 **MR. FALK:** That was an outcome of -- of the --
19 an outcome of -- of using the neutron film
20 calibration factor on the glass plate of tracks
21 read by our projects. Therefore management
22 decided that -- that -- management decided to
23 actually include the -- the -- the re-reads of
24 the glass plate in the scope of the project.

25 **MR. BUCHANAN:** What was the condition of glass

1 plates? Now, I understand glass plates are
2 more fragile than film obviously
3 (unintelligible) than film and some of them
4 were not -- were they in readable shape, most
5 of them?

6 **MR. FALK:** Most of them were in readable shape.
7 There were -- There were about, I don't know,
8 30 or 40 of them that were not and therefore we
9 did not modify those doses.

10 **MR. BUCHANAN:** Okay. So what you're saying
11 then is that apparently based on glass plates
12 were more extensive (unintelligible) than film,
13 NDA films which calibrating factors -- using
14 calibration factors from the film that gave us
15 (unintelligible) dose; is that correct?

16 **MR. FALK:** I'm not sure that I -- that I heard
17 all of that but there were a couple
18 differences. It turns out that -- It turns
19 out that Los Alamos only read one square
20 millimeter of -- of -- of the surface area
21 whereas the project read ten square -- read the
22 ten square millimeters of it so that was one
23 improvement in the counting statistics as well
24 as the application of the NTA of -- of the NTA
25 film calibration factors. So both of those

1 were a factor.

2 **MR. BUCHANAN:** So I assume what you're saying
3 here is that in your opinion that the NDA
4 plates, the doses recorded from them are
5 correct.

6 **MR. FALK:** I don't know if they are correct but
7 they are claimant favorable relative to the --
8 relative to the dose of record currently based
9 on the original reads.

10 **MR. BUCHANAN:** Okay. Arjun, (unintelligible).

11 **DR. MAKHIJANI:** No. No, I think the -- the,
12 you know, I guess the only question would
13 relate to the original reads and -- and if
14 there's, you know, documentation that the
15 original reads are okay then -- then I think
16 the question would be resolved. But the
17 specific question in regard to calibration
18 would be resolved. I guess (unintelligible)
19 shifted a little bit because I haven't ever
20 thought -- I hadn't thought of going back to
21 the original reads and I did not know the
22 source of the differences so I guess you have
23 documentation about the --

24 **MR. GRIFFON:** Arjun, I can't hear --

25 **DR. MAKHIJANI:** I'm asking whether -- whether

1 the NDRP had documentation about the original
2 reads and the protocols and how they were done
3 and so forth.

4 **MR. FALK:** Yes, we -- we did capture a lot of
5 that documentation from a trip out to Los
6 Alamos.

7 **DR. MAKHIJANI:** Is that available like on the O
8 drive or --

9 **MR. FALK:** No, I do not believe that is on the
10 O drive.

11 **DR. MAKHIJANI:** Yeah, I -- Yeah, I think -- I
12 think, you know, but the specific question
13 anyway has been addressed.

14 **MR. BUCHANAN:** It's okay with me.

15 **MS. MUNN:** So we're done with 6?

16 **DR. NETON:** Done with 6.

17 **DR. ULSH:** Okay. The --

18 **MR. GRIFFON:** I'm looking at your other Word
19 documents that you sent. Is number 6 addressed
20 in this 24 March, 2006 Comments and Responses?

21 **MS. MUNN:** Yes.

22 **MR. GRIFFON:** Is that it? Okay.

23 **MS. MUNN:** That's it.

24 **MR. GRIFFON:** We've discussed it like two or
25 three times. If we've discussed all the

1 aspects of this why don't we just scan through?

2 **DR. ULSH:** Let me look here, Mark, just to be
3 sure.

4 **MR. GRIFFON:** Yeah.

5 **DR. ULSH:** We provided the OTIB 50. Let's see.
6 Okay. The justification for using NTA film
7 calibration for glass track. That's what we
8 just talked about.

9 **MR. GRIFFON:** Right.

10 **DR. ULSH:** Let's see. Oh, the other one was
11 using one or two neutron calibration spectra to
12 cover all neutron energy spectra at Rocky
13 Flats. That is an issue that was raised in
14 some of the later comments.

15 **MR. FITZGERALD:** Yes.

16 **DR. ULSH:** We'll get to that if -- I'd like to
17 defer that if possible.

18 **MR. FITZGERALD:** We -- We have a general --

19 **MR. GRIFFON:** (Unintelligible)

20 **MR. FITZGERALD:** -- Mark, a general discussion
21 of OTIB 50 which I just emailed you a copy of
22 the draft from which the questions which Brant
23 is referring to are derived. We were going to
24 wait until the answers came back before issuing
25 a final but I'm going to go ahead and circulate

1 a draft along with the answers. Brant told me
2 to circulate the answer to separate questions.
3 So we probably need an OTIB 50 discussion that
4 would involve some of the issues coming out of
5 that review. And we can do it anywhere you
6 want but I would suggest after lunch.

7 **MR. GRIFFON:** Okay. All right. That's fine.

8 **DR. ULSH:** Okay. Are we then ready to move on
9 to matrix item number 7?

10 **MR. GRIFFON:** It might be -- is it time to
11 break for lunch?

12 **DR. WADE:** There are a lot of hungry people
13 around this table. All right. Why don't we
14 break for lunch and plan on being back at 1:00
15 p.m. Okay. We'll break the line now and then
16 dial back in at 1:00.

17 **MR. GRIFFON:** All right.

18 **DR. WADE:** Thank you all.

19 **MR. GRIFFON:** Bye.

20 (Whereupon, a recess was taken from 12:00 p.m.
21 to 1:05 p.m.)

22 **DR. WADE:** For those of you on the phone, don't
23 put us on hold or don't think you can switch to
24 another line and do something else. We got
25 music and we got all manner of things so, you

1 know, be very careful with how you deal with
2 this open line. Again, as I said before, it's
3 important work and we want to have this vehicle
4 available to us to do it. I think we've done
5 wonderful work this past two days. So please
6 help us preserve our ability to have these
7 kinds of meetings and these kinds of calls by
8 sort of policing your actions well. And now
9 Ray's going to give you his version of a public
10 service announcement.

11 **THE COURT REPORTER:** Okay. The audio-visual
12 guy here said in order to prevent the
13 recipients of our telephone from getting so
14 much reverberation they had to turn these mikes
15 down so he said speak close and very directly
16 into the mikes. And we now have these hand-
17 holds so just make sure this green button is
18 lit if you're going to use one of these. And
19 it should stay lit but if it goes off then hit
20 the mute button and it should come back on.
21 But just remember to speak directly because the
22 volume had to be turned down.

23 **DR. WADE:** Okay. So let's get back to it. We
24 were on a roll this morning and let's see if we
25 can continue that well into the wee hours of

1 the night as we continue to work around the
2 clock.

3 **MS. MUNN:** The wee hours being a couple of
4 hours from now.

5 **PLUTONIUM TETRACHLORIDE CALIBRATION**

6 **MR. GRIFFON:** Yeah, I think we were on item 7,
7 right?

8 **MS. MUNN:** Item 7.

9 **DR. ULSH:** Seven, action item 1.

10 **MS. MUNN:** Plutonium tetrachloride calibration.

11 **DR. ULSH:** This issue I think has been
12 superseded by some of the comments that SC&A
13 sent over in the past week. It really should
14 have been that SC&A would review the article by
15 Mann and Boss. They have done that and we have
16 submitted some questions on that article which
17 are included in the -- the other comment sets.
18 So I would propose that we defer that until we
19 get to those -- those other comments if that's
20 acceptable to everybody.

21 **MR. GRIFFON:** That's fine.

22 **DR. ULSH:** Okay. Oh, sorry. I think that is
23 it for number 7. Number 9 is a big one on data
24 integrity.

25 **DATA INTEGRITY**

1 **MS. MUNN:** Yes.

2 **DR. ULSH:** The first action item talks about
3 OTIB 50 and SC&A would review that. And I
4 think that's what Joe handed out this morning;
5 is that correct, Joe?

6 **MR. FITZGERALD:** Yeah. We went ahead and did a
7 review of OTIB 50. Ron, are you still on the
8 phone?

9 **MR. BUCHANAN:** Yes, I'm here.

10 **MR. FITZGERALD:** Yeah, we were going to go
11 ahead and integrate responses to the questions
12 so the cart got a little bit before the horse.
13 I went ahead and circulated the -- certainly
14 the preliminary analysis and that with the
15 answers to the questions is pretty much where
16 we are now with OTIB 50. We did have some
17 issues. We did respond to those issues so I
18 think just so you have the context. You have
19 the analysis as well of the answers to the
20 questions.

21 **DR. ULSH:** So I -- I -- I think that perhaps
22 the issues that are discussed in this are also
23 included in the comments that we'll be
24 addressing a little bit later; is that --

25 **MR. FITZGERALD:** Yeah. Yeah.

1 **DR. ULSH:** Okay.

2 **MS. MUNN:** Are the items that are underlined
3 and starred --

4 **MR. FITZGERALD:** Oh.

5 **MS. MUNN:** -- of particular import to you?

6 **MR. FITZGERALD:** Actually I started emphasizing
7 certain pieces of that not realizing that it
8 would have to be copied. And when I tried to
9 print it out on the PC over here in the
10 business office the ink ran out. So in keeping
11 with everything else we've gone through today,
12 I decided, well, okay, you have the benefit of
13 some of my scribbles.

14 **MS. MUNN:** Thank you.

15 **MR. FITZGERALD:** No other -- no other
16 importance.

17 **DR. WADE:** Transparency in all things.

18 **MR. FITZGERALD:** That's right.

19 **DR. ULSH:** Action item number 2 deals with
20 NIOSH's efforts --

21 **MR. GRIFFON:** Could you read -- I'm sorry,
22 Brant. It's a little hard now for me to hear
23 you guys.

24 **DR. ULSH:** Oh, I'm sorry.

25 **MR. GRIFFON:** I don't have the reverberation

1 any more but item -- item 1 is now deferred to
2 --

3 **DR. ULSH:** No. Well, yes. Action item 1 deals
4 with SC&A's review of OTIB 50 which they have
5 completed, and they've submitted some questions
6 based on that in this -- in the later comment
7 sets that we're going to talk about hopefully
8 this afternoon.

9 **MR. GRIFFON:** Okay. So that comes up under
10 what, one of the (unintelligible) at the end or
11 --

12 **DR. ULSH:** Yeah.

13 **MR. FITZGERALD:** Yeah, there's one at the end.
14 And Mark, just for your information I went
15 ahead and emailed --

16 **MR. GRIFFON:** Yeah, I have that.

17 **MR. FITZGERALD:** Fine.

18 **MR. GRIFFON:** Go ahead with number 2 then. I'm
19 sorry.

20 **DR. ULSH:** Okay. Number 2 deals with NIOSH's
21 efforts to obtain Dr. Ruttenberg's data. That
22 does continue. I'm scheduled to visit with Dr.
23 Ruttenberg in Colorado next week. But again I
24 do want to reiterate as I did at the last
25 meeting that we have realistic expectations

1 about what the Ruttenberg data might provide
2 for us. I think that if we provide co-worker
3 models that everyone agrees to the real value
4 of the Ruttenberg data, and this is my
5 speculation, would be that it would allow us to
6 do perhaps more precise co-worker calculations.
7 However, I don't want anyone to have the
8 impression that if we don't get the Ruttenberg
9 data we don't have a -- an approach. That --
10 That's certainly not accurate. The other thing
11 --

12 **MR. GRIFFON:** I'm trying to remember, Brant,
13 how the Ruttenberg data had originally got to
14 the table.

15 **MR. FALK:** It was a comment by SC&A.

16 **DR. ULSH:** I think it was a comment in SC&A's
17 review of (unintelligible); is that correct?

18 **MR. GRIFFON:** That you should consider that
19 data?

20 **MR. FITZGERALD:** Yeah. And really it was in
21 the context of the job categories that would
22 enable perhaps a better fit on the modeling. I
23 -- I tend to agree with what Brant's saying,
24 that it's a question of precision that -- that
25 in a way you would be able to apply the model

1 more precisely having the job categories that
2 Ruttenberg has.

3 **MR. GRIFFON:** But it sounds like it's probably
4 not an SEC sort of issue.

5 **DR. ULSH:** Well, that's my contention. I mean
6 it's not a --

7 **MR. GRIFFON:** Right.

8 **DR. ULSH:** -- not a closed issue but --

9 **MR. GRIFFON:** Right.

10 **DR. ULSH:** -- I don't see it as an SEC issue.

11 **MR. GRIFFON:** Okay.

12 **DR. ULSH:** Okay. Can we move on to number 3
13 then if --

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

15 **DR. ULSH:** Okay. Number 3. Okay. This is one
16 that, an SC&A action item that they were going
17 to review our completeness of external exposure
18 data.

19 **MR. FITZGERALD:** Ron, are you following on the
20 action item?

21 **MR. BUCHANAN:** Yes, I'm following that. I do
22 not have (unintelligible).

23 **MS. MUNN:** You're breaking up. We can scarcely
24 hear you.

25 **MR. BUCHANAN:** Okay. Can you hear me now?

1 **MS. MUNN:** Better.

2 **MR. BUCHANAN:** I get a (unintelligible) of --
3 of external dose data. To kind of summarize my
4 question on 1 and 3 of that sheet that I sent
5 in, there's some questions I've done other work
6 on (unintelligible) posted data. I don't know
7 if Arjun had done anything on that or not.

8 **DR. ULSH:** Ron, just for clarification, are the
9 three questions that you're talking about the
10 ones that were sent over this past Friday? Is
11 that what you're talking about?

12 **MR. FITZGERALD:** Yeah. Yeah. He's saying 1
13 and 3 addresses the -- the comments on OTIB 50,
14 two of them address the what are perceived as
15 gaps perhaps in -- and 1 and 3 address some of
16 those issues. So this is responsive to this
17 particular item but that's all we have at this
18 point.

19 **DR. ULSH:** Okay.

20 **DR. MAKHIJANI:** This -- if you ask me, I have
21 not looked at gamma dose or beta dose issues at
22 Rocky Flats. I just looked at the internal and
23 the (unintelligible).

24 **DR. ULSH:** So is it accurate to say that this
25 action item has been superseded by the three

1 questions that Ron submitted?

2 **MR. FITZGERALD:** Well, from the standpoint of
3 neutrons. I think we focused on NDRP and the
4 neutron issue. We probably need to and owe a
5 closeout on anything else that would be on the
6 external side. I think the neutron issue is
7 the big issue --

8 **DR. ULSH:** Okay.

9 **MR. FITZGERALD:** -- that we were focusing on.
10 I don't believe that there are other pressing
11 issues that we've identified to date so...

12 **MS. MUNN:** So from an action item point of
13 view, 3 is actually still open?

14 **MR. FITZGERALD:** Yeah, but I think we just have
15 to cross a T that, you know, we've identified
16 neutron as the issue in that regard. But we
17 probably need to get back to you and to NIOSH
18 if there's anything else on the external side.
19 We don't think so but we need to firm that up.

20 **MR. GRIFFON:** Can someone refresh my memory?
21 What document were you reviewing that -- I know
22 was (unintelligible) but (unintelligible)
23 pretty conservative (unintelligible) data that
24 NIOSH provided. What document is that, what
25 date?

1 **DR. ULSH:** Well, I don't know that we provided
2 in one of our comment responses -- I think it
3 was the responses that we provided for the
4 Boston meeting.

5 **MR. GRIFFON:** Yeah, I think it was the Boston
6 meeting.

7 **DR. ULSH:** There was a graph in there talking
8 about how many people were monitored per year
9 but I don't know if that's the document that
10 we're referring to here. Is that?

11 **MR. FITZGERALD:** I'm not sure either.

12 **MR. GRIFFON:** (Unintelligible)

13 **MR. FITZGERALD:** That is a little murky but the
14 only issue that we've addressed in terms of
15 completeness is the neutron issue so maybe we
16 need to go back along with NIOSH and just
17 figure out where that, you know, that item sits
18 and close it out by next session.

19 **MR. GRIFFON:** Yeah, I have to take a
20 (unintelligible) to determine --

21 **MS. MUNN:** Yeah, I thought that went back
22 before Boston actually but...

23 **DR. ULSH:** Could be.

24 **MR. BUCHANAN:** Yeah, I don't know, I don't know
25 where that came from. I'm not familiar with

1 (unintelligible) reviewing the
2 (unintelligible).

3 **MS. MUNN:** You faded out toward the end.

4 **MR. GRIFFON:** I think this came out of the --
5 the document that, Brant, you sent before the
6 Boston meeting, comments and responses for
7 Boston.

8 **DR. ULSH:** Okay.

9 **MR. GRIFFON:** Well, I'll try to track that back
10 to you and get a better matrix.

11 **MR. FITZGERALD:** So maybe we should leave it as
12 an action for us to work with, Brant, and just
13 backtrack this thing and then come back with a
14 -- a response.

15 **MR. GRIFFON:** Yeah.

16 **MS. MUNN:** Good. Think it over.

17 **DR. ULSH:** I guess the next action item is
18 number 4 under comment 9, and that is the co-
19 worker data. I'd like to give you a little --
20 a brief update on where we are with that. We
21 have CEDR data for both internal and external.
22 We also have the site -- site database, HIS-20,
23 and we are in the midst of comparing those two
24 data sets. And the preliminary analyses look
25 pretty good but we are still doing some QAQC on

1 both of those data sets. We anticipate having
2 that up in fairly short order.

3 **MS. MUNN:** So it's still an open item?

4 **DR. ULSH:** Yes, it's still an open item for us.

5 **MR. GRIFFON:** Can you -- Can you just repeat
6 that a little? You've got two databases that
7 you're --

8 **DR. ULSH:** We -- We have both internal and
9 external data from CEDR. We also have internal
10 and external data from the site database, HIS-
11 20, that's the name of the site database. And
12 we are currently comparing the two to determine
13 whether they match. And so far the preliminary
14 analyses look pretty good but we are still
15 doing some QC on -- on both data sets.

16 **MR. GRIFFON:** But -- But can I -- can I ask a
17 question on -- on pedigree? I mean aren't you
18 using HIS-20?

19 **DR. ULSH:** I'm sorry. Using what?

20 **MR. GRIFFON:** Aren't you using HIS-20 databases
21 for the project? Wasn't CEDR developed from
22 HIS-20? Seems to me you're validating against
23 something that came after.

24 **DR. ULSH:** No, actually, Mark, what we're --
25 what we're doing, for the external I'm pretty

1 sure that we're going to wind up using HIS-20.
2 For the internal we have -- ORAU has developed
3 a -- a draft TIB for us that used CEDR data and
4 we are considering the time frame available.
5 We're trying to determine whether it makes
6 sense to use the CEDR data and validate it
7 against the HIS-20 or whether to
8 (unintelligible). We've done some comparisons
9 between the two and they look very similar.
10 But that's from the internal side.

11 **MR. GRIFFON:** And can you from a co-worker's
12 model -- I don't know if you could sense this
13 at all. I don't think if we were after this
14 but the question did come up about how -- what
15 -- what fraction of potential claimants would
16 require co-worker data to be viewed, sort of
17 like we looked at at Y-12. It was a fairly
18 large percentage though; I think we had the
19 impression it would be a small percentage for
20 the Rocky workers. Is that --

21 **DR. ULSH:** Well, coincidentally I have some
22 information hot off the presses from Matt Smith
23 that we currently have two Rocky Flats cases on
24 hold for co-worker data.

25 **MR. GRIFFON:** Okay.

1 **DR. ULSH:** Out of about 1,000 claims -- over
2 1,000 claims.

3 **MR. GRIFFON:** So there's only two out of 1,000?

4 **DR. ULSH:** Well --

5 **MR. GRIFFON:** Or is that something
6 (unintelligible) true? Okay.

7 **DR. ULSH:** Right. There are two that are
8 identified as being on hold for co-worker data.

9 **MR. GRIFFON:** But is it fair to say that it's a
10 much smaller fraction --

11 **DR. ULSH:** I think it's --

12 **MR. GRIFFON:** -- that are required --

13 **DR. ULSH:** I think that is fair to say, Mark,
14 that it is a much smaller issue here at Rocky
15 Flats. Okay. Action item number 5 unless
16 anyone has anything else for that. Action item
17 number 5 deals with a number of issues, blanks
18 and zeros in the record. And let me see if
19 there's anything else here. Oh, neutron
20 monitoring, readings found to be in error until
21 the 1970s and the dosimeter chips were
22 sometimes destroyed or lost during processing.
23 I think, Joe, correct me, but I think all of
24 these issues have been included in the new data
25 sets that you sent over; is that accurate?

1 **MR. FITZGERALD:** Yeah, the list and comments,
2 yeah.

3 **DR. ULSH:** Yeah. Okay. So it might be, Mark,
4 that this item has been superseded by the new -
5 -

6 **MR. FITZGERALD:** Well, the new one is -- is
7 simply I think a consolidation --

8 **DR. ULSH:** Right.

9 **MR. FITZGERALD:** -- an itemized list of the
10 data integrity issues. Mark, you're familiar
11 with that one, the piece that Arjun originated
12 that -- that we wanted to put together just so
13 we wouldn't lose all these various -- I think
14 it was actually Dr. Ziemer who requested a sort
15 of an itemized complete list of all the issues
16 that were not only listed here but also
17 included in the petition. So we have one place
18 where all these issues were -- were listed.
19 And that was the purpose of that piece.

20 **DR. ULSH:** Yeah, that's a good clarification.
21 Thank you. The list is new in that it just was
22 delivered to NIOSH but not all the issues in
23 the list are new.

24 **MR. FITZGERALD:** Right. It's a consolidation
25 of both the petition issues --

1 **DR. ULSH:** Right.

2 **MR. FITZGERALD:** -- as well as the issues in
3 here.

4 **MS. MUNN:** So the statement that the
5 allegations should be addressed in the petition
6 evaluation remains outstanding?

7 **MR. GRIFFON:** Just to go back for a second. I
8 think I have -- there -- there is this
9 document, Brant, that you developed following
10 the Comments and Responses, for Bob.

11 **DR. ULSH:** Right.

12 **MR. GRIFFON:** And on page 5 of that document
13 it's under response for number 9, question
14 5.11.2, -- 5.11.2. There's a -- There's a
15 response to (unintelligible) data and it's
16 titled that way (unintelligible) matrix
17 (unintelligible) item. I think the idea was
18 for asking me to look over that.

19 **DR. ULSH:** That's action item 3?

20 **MR. GRIFFON:** That's action item 3, correct.

21 **DR. ULSH:** Okay. Just to clarify. It's not
22 one of the handouts for today. It was the
23 responses that I prepared for the Boston
24 meeting.

25 **MR. GRIFFON:** Correct.

1 **DR. ULSH:** Both SC&A and I are laughing because
2 it's hard to keep all of these balls in the
3 air. Okay.

4 **MR. GRIFFON:** Right.

5 **DR. ULSH:** So all of these issues I think in
6 action item number 5 are included in the new
7 list and we have addressed them in the
8 handouts, and hopefully we'll get to that a
9 little bit later to discuss those responses.

10 **MS. MUNN:** So what we have today that we
11 haven't discussed yet is SC&A's review as it
12 applies to the SEC.

13 **DR. ULSH:** Review of --

14 **MR. GRIFFON:** Wanda, I can't hear you.

15 **MS. MUNN:** I was just trying to clarify in my
16 mind that what we're going to discuss later is
17 SC&A's review as it applies to the SEC petition
18 in question -- review of these questions.

19 **DR. MAKHIJANI:** Ms. Munn, it's because it's not
20 a review. It's a -- It's a -- what I did was
21 simply go over issues raised by -- by Joe and
22 Steve on the site profile and go through the
23 petition and compile the issues that looked
24 like data integrity issues and do a list.

25 **MS. MUNN:** Okay.

1 **DR. MAKHIJANI:** As Dr. Ziemer suggested.

2 **DR. ULSH:** Okay. That takes us to action item
3 number 6 I believe. There's a NIOSH action
4 item here that we need to research this
5 question further and the question is NIOSH to
6 follow up on inappropriate low energy photon
7 detector correction factor that may have been
8 used as stated in the 1993 DNFSB report. Jim,
9 help me out. Where are we going to -- That's
10 another ball in the air that I --

11 **MR. LANGSTED:** Yeah, Jim Langsted here. We've
12 been researching this and trying to find more
13 specifics on the issue and can't find anything
14 from the DNFSB on this subject. But what we
15 believe it is was an issue that came up in the
16 early days of the DOELAP accreditation process.
17 They at one -- one time had a K-16 X-ray
18 technique that they used for low energy photons
19 and then they also had an M-60 X-ray technique.
20 And it turned out there were some significant
21 problems evaluating these two together and the
22 DOELAP ultimately dropped the K-16 method. And
23 we believe it has to do with that and the
24 response of our dosimeters and the algorithms
25 that were used to process this data. We're

1 looking at that and we'll have a -- an analysis
2 on that available here shortly.

3 **MS. MUNN:** So it's still open.

4 **MR. GRIFFON:** Okay.

5 **DR. ULSH:** Okay. Action item number 7; that we
6 will determine the extent and nature of the
7 criminal investigations and/or security
8 investigations mentioned by the petitioner
9 during the Boston working group meeting. On
10 March 15th I sent a letter to Tony DeMaiori
11 that is included in your handout on page 6, a
12 copy of that letter requesting that he provide
13 -- he mentioned in his comments that he had a
14 number of these investigation reports in hand.
15 And so we requested that he send those to us or
16 just give us the citations so that we could
17 search them down ourselves and to date we have
18 not had any response on that. So I think
19 that's where we are with -- with this issue.

20 **MR. GRIFFON:** Tony on the -- on the phone?

21 **DR. WADE:** He wasn't earlier.

22 **DR. ULSH:** He didn't announce earlier. I don't
23 think he is actually.

24 **MS. MUNN:** No.

25 **MS. THOMPSON:** Tony's not on the phone right

1 now because he's meeting with a person from
2 (unintelligible) and Associates at his office.
3 This is Jennifer Thompson. He received the
4 letter and actually you will be getting a
5 letter in response that he just sent yesterday.
6 And she is picking up a work copy of the report
7 and you have contact information as to how to
8 get association reports. They're not covered
9 documents. He can't really ask for
10 (unintelligible) but you guys should be able to
11 get copies of them from the DOE
12 (unintelligible).

13 **DR. ULSH:** Okay. That's great. If you can
14 just give us the citations we'll -- we'll run
15 them down.

16 **MS. THOMPSON:** (Unintelligible) that you should
17 be receiving.

18 **DR. ULSH:** Okay. Thank you.

19 **MR. GRIFFON:** Thank you.

20 **DR. ULSH:** Okay. Number 8, action item number
21 8; NIOSH will demonstrate the reliability of
22 bioassay and external database. I think we
23 talked about that under co-worker.

24 **MR. GRIFFON:** I think that's a --

25 **DR. ULSH:** Oh, is this a different issue?

1 **MR. GRIFFON:** Well, NIOSH is a different issue
2 in that you -- you took (unintelligible) going
3 back to the raw data.

4 **DR. ULSH:** Okay. So the issue is to go back
5 from the HIS-20 database and compare it to the
6 paper records?

7 **MR. GRIFFON:** Right.

8 **DR. ULSH:** Okay.

9 **MR. GRIFFON:** Or -- Or -- Or (unintelligible)
10 as one of the possibilities that we have used
11 for the Y-12 effort.

12 **DR. ULSH:** Okay. That effort also continues.
13 It's not closed yet. We haven't found any
14 problems yet but I -- I don't want to say that
15 our analysis is completed.

16 **MR. GRIFFON:** I mean do you know if there is
17 raw data available though or are you
18 (unintelligible) been able to find that much?

19 **DR. ULSH:** There is raw data available. Jim,
20 how about if I defer to you and you can talk
21 about what -- what records are available and
22 the -- the claimant files. And Craig Little
23 might also have some input to provide on that.

24 **MR. LANGSTED:** Okay. I was dozing. No, I
25 wasn't dozing off, no, sorry. In -- In terms

1 of the -- the comparison between the electronic
2 database and the -- the bioassay and the
3 external dosimetry data, in terms of external
4 dosimetry the Kaiser Hill as they pulled
5 together the claimant files did do a QC check
6 between the electronic data and the data that
7 was in the claimant's health physics printed
8 file. And that data was -- was carefully
9 checked and there was a -- a QC sheet that was
10 generated as that happened. And so all the
11 files that have been sent over for claimants
12 have been checked in terms of external. To
13 take that one step further back to the original
14 laboratory --

15 **MR. GRIFFON:** Can I ask you just -- just to
16 stop there? I'm sorry. That -- That
17 comparison of working in claimants' files
18 versus working in a database, what's in the
19 claimant's file, is that -- I'm not sure with
20 Rocky Flats but is that a (unintelligible) on
21 the database? I mean or is it -- or is there
22 another source record?

23 **MR. LANGSTED:** Both the print -- both the
24 printout from the electronic database and the
25 records that were generated at the time and put

1 in the workers health physics file are provided
2 for the claimants.

3 **MR. GRIFFON:** Okay. Okay. Because I imagine
4 printouts would (unintelligible) pretty well.
5 I was hoping that the others would be a more
6 useful check.

7 **MR. LANGSTED:** Yes, one would -- yeah, one
8 would help the printout -- would join up with
9 the electronic, exactly. Exactly. And it
10 turns out the printed records that were in the
11 file, and as I -- I talked about at Boston,
12 Rocky Flats was their primary source of record
13 keeping for health physics records was the
14 printed file and the -- the data that went into
15 that printed file. The electronic database, of
16 course, came on later on as computers became
17 available. But -- And a lot of work has gone
18 into that electronic database so we're fairly
19 comfortable with using that electronic database
20 to generate the co-worker data and it --

21 **MR. GRIFFON:** Is there any kind of rolled up
22 (unintelligible) or (unintelligible) you
23 couldn't get (unintelligible) matched pretty
24 well. And there's a letter that goes along
25 with the -- a QC letter. Are there any sort of

1 roll up reports that (unintelligible) and X
2 number of claimants processed and we, you know,
3 we -- here's our QC reports and sort of summary
4 of the records (unintelligible) database
5 testimony.

6 **MR. LANGSTED:** No, Kaiser Hill did not keep a
7 tally of --

8 **MR. GRIFFON:** Right.

9 **MR. LANGSTED:** -- of how accurate that was. You
10 know, in retrospect that would be a nice piece
11 to have here. What we do have is the next step
12 back in that process for external dosimetry.
13 Craig Little will talk about some analyses that
14 he has done on some of the records. And this
15 was actually going back to the original
16 laboratory worksheets and comparing those with
17 the data that's in the health physics file now.
18 Another -- Another link in the chain I guess.
19 And he -- he took a look at that data and has
20 some material we can go over here when you guys
21 think that's appropriate.

22 **DR. ULSH:** That would be now.

23 **MR. LANGSTED:** Okay.

24 **MR. GRIFFON:** (Unintelligible)

25 **MR. LANGSTED:** Let me pass the -- Let me pass

1 the microphone on to Craig.

2 **MR. LITTLE:** What we did over the -- pardon me

3 -- over the last month was we looked at scanned

4 in data sheets, laboratory -- laboratory data

5 sheets and pulled data sheets that corresponded

6 to claimants. And we went back to the -- it's

7 a scanned in -- scanned in file of a -- of a

8 handwritten data sheet. We went back to -- we

9 found about 2,800 pages of those and we went

10 through those and compiled over 400 person

11 quarters or worker quarters of data if you will

12 where we have a handwritten data sheet that's

13 complete for a quarter; and we compared that to

14 -- to the data that's in the -- that's in the

15 claimant file in -- either in the HIS-20 or the

16 -- it's a computer printout that's part of the

17 data file. And most of the cases, and I would

18 -- in every single case where we found a

19 complete match of a quarter or an annual -- an

20 annual case the claimant file either matches

21 exactly or has a larger number than the number

22 that's found in the -- in the beta gamma

23 laboratory worksheet. But the difference is

24 data that's neutron data that we haven't been

25 able to find the -- the handwritten data sheet

1 for yet. And that's our -- that's our
2 presumption anyway but it -- but it -- And 80
3 or 85 percent of the cases we -- where we found
4 complete annual data sets, the data match
5 exactly. And the remaining 15 percent or so
6 they don't match and the -- and the missing
7 link if you will is neutron data because the
8 claimant data file, that is the data that's in
9 the claimant's file is a -- is a larger number
10 than the number that I found which simply means
11 that there's some -- some dose that I haven't
12 found a piece of paper to represent yet.
13 There's no evidence of any systematic bias or
14 anything of that nature. And we tried to find
15 doses ranging -- well, we didn't search for
16 doses exactly. We just searched -- we randomly
17 pulled -- pulled claimant files if you will,
18 and I did this for ease of use if you will. I
19 -- I pulled claimants from a number of
20 different last names starting with A and
21 working down through W. And -- And just then
22 tried to go through the data for the these --
23 the periods that I had which were mostly mid-
24 '60s, late '60s, and pulled -- pulled
25 corresponding handwritten data sheets, entered

1 those into a spreadsheet and then did -- simply
2 did a calculation to show that the numbers were
3 the same number. So...

4 **MR. GRIFFON:** Did -- Did you write this up or
5 is this written up anywhere?

6 **MR. LITTLE:** It's not yet. We're still sort of
7 in process on it. But we can get it written up
8 fairly soon.

9 **MR. GRIFFON:** Sounds very useful, yup.

10 **DR. ULSH:** Okay. Unless anyone has anything
11 else to add that's action item number 8.

12 **MR. GRIFFON:** What do you hear on the internal
13 dose? That was external. Is there anything on
14 the internal side?

15 **MR. LANGSTED:** Internal dosimetry records are
16 somewhat more problematic. The laboratory --
17 the basic laboratory data was not or could have
18 been archived but there has been no effort to
19 pull that data and compare it to what's in that
20 database. The laboratories have changed over
21 the years and -- and data has come in from
22 various forced. We have some documentation
23 discussing how the data came into the database,
24 you know, and as the years progressed
25 laboratories started to submit electronic

1 deliverables that were then put directly into
2 the -- the database. But that is a larger
3 effort over -- over multiple years and we don't
4 have any QC data available on that issue.

5 **MR. GRIFFON:** Well, I guess -- I mean it's
6 still an open item I would say, yes. I mean is
7 there any -- any help with (unintelligible) or
8 anything like that maybe you could pull for
9 summary statistics?

10 **MR. LANGSTED:** Well, the -- the worker -- the
11 health physics file, the printed file -- does
12 it have the bioassay?

13 **MR. LITTLE:** Some of the claimant files do.

14 **MR. LANGSTED:** Yes, the claimant files do have
15 data in there and we could do a comparison
16 between that and the -- the computer file
17 similar to what Mr. Little did with the
18 external data.

19 **MR. GRIFFON:** Okay. And again I'm assuming
20 that the (unintelligible) printout of each one.

21 **MR. LANGSTED:** I'm sorry. Say that again.

22 **MR. GRIFFON:** I'm assuming that for all sources
23 that you (unintelligible) HIS-20. There
24 wouldn't be a printout of data.

25 **MR. LANGSTED:** Correct.

1 **MR. GRIFFON:** In the person's file.

2 **MR. LANGSTED:** Yes. What's in -- what's in the
3 person's file predates the HIS-20.

4 **MR. GRIFFON:** Okay.

5 **MS. MUNN:** That's in addition -- that's a new
6 item for me, Mark. I only -- I only had the
7 external.

8 **MR. GRIFFON:** Oh, so (unintelligible) external.

9 **MS. MUNN:** Right. Okay. Thank you.

10 **DR. ULSH:** Okay. So we'll put that down.

11 **MR. GRIFFON:** Okay. We'll leave that open and
12 -- and ongoing on external but it sounds like
13 you've made some progress in that discussion.
14 Okay, Brant. Sorry to cut in there.

15 **DR. ULSH:** No, no. That's all right.

16 **MS. MUNN:** Takes us down to new issues.

17 **DR. ULSH:** Takes us down to at least on -- on
18 the matrix that you circulated, Mark, from the
19 February 27th meeting this is new issue number
20 1.

21 **MR. GRIFFON:** Right.

22 **PENETRATING DOSES PRIOR TO 1976**

23 **DR. ULSH:** And this was the roll up of the
24 penetrating doses prior to 1976. And the
25 comment was that it is not clear how the

1 neutron and photon doses will be determined
2 from the roll up dose. This is also an issue
3 that is reflected in the new lists that contain
4 both new and old issues so I think that we're
5 going to get to that when we cover some of the
6 -- cover the responses to the -- to the new
7 list.

8 **MR. BUCHANAN:** Yes. This is Ron Buchanan. The
9 (unintelligible)

10 **DR. ULSH:** Ron? Ron, it's difficult to hear
11 you again. Can you get closer to the phone?

12 **MR. BUCHANAN:** Yes. New item number 1 has
13 pretty much been answered, you know,
14 (unintelligible). The only (unintelligible)
15 for 1970 (unintelligible).

16 **UNIDENTIFIED:** That's in the questions?

17 **DR. ULSH:** Right. That's in the questions that
18 SC&A sent over so we'll -- we'll cover those in
19 -- in due course.

20 **ALGORITHM**

21 New issue number 2 has to do with the problem
22 with the algorithm and this was a -- an SC&A
23 action item on this.

24 **MR. FITZGERALD:** Actually at the Boston meeting
25 we got an explanation and I think the -- the --

1 the very last line we would continue to review
2 that in the context of the overall review. I'm
3 not sure that it was really an action item per
4 se. I don't think there was any disagreement.
5 We just figured we would leave that open in
6 terms of any other issues that would come out
7 of our NDRP review. But I don't think there's
8 any new issue. Ron, do you have anything on
9 issue 2?

10 **MR. BUCHANAN:** Yes, on issue 2, we discussed
11 that I think (unintelligible) and we feel
12 (unintelligible) evaluating it both ways, both
13 (unintelligible) and neutron is claimant
14 favorable. I don't think neutron
15 (unintelligible) on that.

16 **MR. FITZGERALD:** Okay. That's what I thought.
17 Okay. Thank you.

18 **MR. GRIFFON:** I think we can pull it up and
19 close it out.

20 **MR. FITZGERALD:** Yeah.

21 **MR. BUCHANAN:** I agree with you
22 (unintelligible).

23 **DR. ULSH:** And that takes us to the end of the
24 February 27th matrix. Mark, you're kind of the
25 emcee here.

1 **MR. GRIFFON:** Well, you lost me. You deferred
2 so many that I'm not sure where we are. But I
3 think we're deferring them mostly because it's
4 little, right? The --

5 **DR. ULSH:** Yes. There are two new sets of
6 responses. One is dated 21 March, 2006 and one
7 is dated 24 March, 2006. I would propose
8 unless you want to do something different that
9 we just walk through those.

10 **MR. GRIFFON:** Yeah. What I -- What I may do
11 just to keep with our format, I may try to add
12 these issues into the matrix.

13 **DR. ULSH:** Okay.

14 **MR. GRIFFON:** And roll up -- I think some of
15 them will be removed from some areas and put
16 into these new areas. I do want to keep these
17 items in there. I should say also I think the
18 -- were all these comments in -- in response to
19 the list of issues generated by Arjun through
20 reviewing the petition; is that correct?

21 **MR. FITZGERALD:** This is the longer
22 consolidated list. I mean is your piece
23 responsive to that longer list or to the
24 original matrix list of the integrity issues?

25 **DR. ULSH:** There were -- okay, I gave three

1 handouts. The first one, the 27 February 2006
2 Matrix Issues was our responses to selected
3 items from the matrix that we just covered.
4 Then we received 17 -- a list of 17 concerns
5 this past Wednesday and this handout contains
6 our responses to those.

7 **MR. FITZGERALD:** Which is affirmative to that
8 question you just had, Mark.

9 **MR. GRIFFON:** Okay.

10 **DR. ULSH:** Sorry. The short answer is yes.

11 **DR. NETON:** What is this one then, 24th?

12 **DR. ULSH:** Twenty-fourth is three questions
13 that I guess Ron Buchanan sent.

14 **MR. FITZGERALD:** Ron Buchanan, as part of OTIB
15 50, came up with three issues which are
16 actually identified in his analysis and that
17 was the preliminary analysis I circulated today
18 and emailed to you, Mark. And these three
19 issues were the ones that were highlighted in
20 particular in that review. And I mean Brant
21 has passed around answers or responses to those
22 three issues.

23 **DR. ULSH:** Yeah, that's the 24 March 2006.

24 **MR. BUCHANAN:** Yeah, this is Ron. I want to
25 clarify about OTIB 50. We didn't really feel

1 there were necessarily a lot of SEC issues.
2 However, dropping out of all the neutron
3 documentation, the -- the TIB, the
4 (unintelligible) and OTIB 50 were three issues
5 I felt that we need to address from an SEC
6 point of view. And those are the ones we
7 listed as the three main questions and I guess
8 your date is the 24th of March on that. The
9 OTIB 50 itself, any comments on that was mainly
10 a site profile issue. The three questions are
11 more the SEC type issues.

12 **COMMENT RESPONSES, MARCH 21, '06**

13 **DR. ULSH:** So we've got two sets of comment
14 responses to go through, Mark. Do you have any
15 preference? Shall we just go in chronological
16 order?

17 **MR. GRIFFON:** Yeah, that -- that's fine.

18 **DR. ULSH:** Then I would direct you to the
19 handout titled "21 March, 2006, SC&A Comments
20 and NIOSH Responses," and we'll just walk
21 through. Comment number 1 dealt with the zero
22 entries in the dose record when badges were not
23 returned. That was a carryover from matrix
24 comment number 9. And there were two periods
25 of concerned, before 1964, and 1964 and after.

1 And in the response that you see on page 2 of
2 my handout I give an explanation. Let me just
3 walk you through. Before 1964 a blank
4 indicates that the worker was not monitored.
5 On the other hand a zero before 1964 indicates
6 that a worker was monitored but there was no
7 positive recorded dose. Now, in both of those
8 situations we have methods for dealing with it,
9 either through applying missed dose or
10 unmonitored dose using the co-worker data if
11 necessary. And then the time period of 1964
12 and after a blank or a zero could -- could
13 indicate a period when a badge wasn't returned
14 at the scheduled badge exchange and Jim
15 Langsted talked about that at the Boston
16 meeting. Occasionally workers would miss badge
17 exchanges. Perhaps they were sick on the day
18 they were supposed to turn it in. Maybe they
19 just forgot. But in any case they would
20 continue to wear that badge for another badge
21 exchange cycle. When the badge was turned in
22 it was read and the recorded dose would be
23 assigned to one badge quarter. I don't
24 remember if it was the first or the second.

25 **MR. LANGSTED:** Second.

1 **DR. ULSH:** The second badge exchange cycle.
2 For the other -- the first badge exchange cycle
3 they could put a blank in. Or if the computer
4 programs at the time required it they could
5 have entered a zero. In either case NIOSH
6 would handle it by treating it as missed dose
7 because there was a continuous badge. I mean
8 the worker was badged throughout the entire
9 period so we would treat that as a missed dose
10 in either case. A zero entry could also
11 indicate -- after 1964 it could indicate that
12 there was no positive recorded dose on the
13 badge. And if that's the case then we would
14 simply assign a missed dose. Now, there was
15 another question about no data available and
16 what that means when it shows up in the
17 dosimetry records. And what that could mean,
18 either a badge was not turned in or it was
19 turned in and there was a problem with the
20 badge. And there are a number of situations
21 that constitute a problem with a badge, a
22 suspect badge reading. When that happened the
23 internal -- the dosimetry staff conducted an
24 investigation. Things that could lead to --
25 could have triggered an investigation like this

1 would be a suspect high badge reading and there
2 are a number of things that could lead to that:
3 presence of contamination on the badge,
4 detergents, solvents, hair, body oil. When
5 those get on a TLD crystal and the crystals are
6 read can lead to an anomalously high reading.
7 The results of those investigations -- oh, the
8 most obvious answer, too, is the high reading
9 could be real. It could be the worker received
10 a high dose. When -- When a reading was
11 suspect this investigation would commence and
12 the results of this investigation would be
13 placed into the worker's health physics file.
14 However it may not have been communicated to
15 the worker. So from the worker's standpoint
16 they could have turned in a badge, gotten back
17 a report saying no data available, and, you
18 know, it may not be obvious to the worker what
19 had happened here. So that is -- is what we
20 have when we have --

21 **MR. GRIFFON:** Two questions on that, Brant.

22 **DR. ULSH:** Okay. Shoot.

23 **MR. GRIFFON:** That procedure that was
24 formalized, what year was that procedure?

25 **DR. ULSH:** It was in the '80s. Jim, do you

1 have the date?

2 **MR. GRIFFON:** '88?

3 **DR. NETON:** Those are -- Those are '90s.

4 **DR. ULSH:** The procedures that the internal or
5 that the dosimetry section used, Mark, weren't
6 formalized until -- formalized into the form of
7 a procedure until those documents that you see
8 there but they were followed earlier than that.
9 I mean they were followed in the earlier time
10 period so they didn't put them all together
11 into a procedure until that date.

12 **MR. GRIFFON:** But the ones you listed there
13 were -- what years were those? It doesn't say.

14 **MR. LANGSTED:** Those are 1990 -- sometime in
15 the '90s.

16 **MR. GRIFFON:** Yeah.

17 **MR. LANGSTED:** On that subject, in the '80s if
18 you look two pages forward on page 4 there's a
19 diagram. And that comes from a set of
20 operating procedures from 1983. And in that
21 procedure things were not as formalized but
22 there is a section in that procedure that
23 instructs the technicians to take anomalous
24 readings to the supervisor for resolution.

25 **DR. ULSH:** Yeah, there's a Link and Pennock

1 reference that's listed in the caption for
2 figure 1.

3 **MR. GRIFFON:** They also -- in looking at the
4 petition I do recall a specific allegation that
5 this practice or concerns about this no data
6 available when individuals felt that they were
7 in a fairly high exposure area. And I wonder
8 if you -- that was part of the petition package
9 it might be useful to track a very specific
10 case back to the (unintelligible) file and see
11 if in fact that this procedure was followed. I
12 don't know if there's other specific case
13 number that can be tracked and say yes, it did
14 work and it didn't work. Since there was a
15 specific allegation in the petition I think
16 it's worthwhile to -- we do have the specific
17 example given in the petition.

18 **DR. ULSH:** Okay. So we'll put -- we're putting
19 that down as an action item, Mark.

20 **MS. MUNN:** So let me understand correctly. In
21 the case where you had perhaps less than an
22 attentive employee --

23 **DR. ULSH:** I'm sorry. Could you repeat that?

24 **MR. GRIFFON:** I can't hear.

25 **MS. MUNN:** You have a situation where you have

1 less than attentive employees who do not see
2 that their film badges are rotated on the
3 regular basis that should be. There is an
4 excellent possibility that their dose will be
5 overestimated by whatever you consider the LOD
6 of that badge to be for as many times as they
7 failed to rotate their badge.

8 **DR. ULSH:** It is correct that we would apply
9 the missed dose to each -- let's say a worker
10 wore his badge for three badge cycles, which I
11 think would be unusual --

12 **MS. MUNN:** Yeah, it would.

13 **DR. ULSH:** -- but let's just say that it --
14 that it happened. What you would essentially
15 have is the recorded -- the dose -- the dose
16 that was recorded on the dosimeter, the film
17 badge or the TLD, would be recorded in the
18 third exchange cycle. For the first two
19 exchange cycles we would apply missed dose so
20 yes, that would be claimant favorable.

21 **MS. MUNN:** Okay.

22 **MR. GRIFFON:** And at least that's as it's
23 described.

24 **MS. MUNN:** At least what?

25 **MR. GRIFFON:** I agree that as it's described,

1 at least the way you're characterizing it I
2 agree that would be claimant favorable. I
3 think we've heard, you know -- I think we
4 (unintelligible) you know.

5 **MS. MUNN:** Considerably more than that, you
6 know.

7 **MR. GRIFFON:** Make sure we (unintelligible). I
8 think it's more than claimant favorable. The
9 one scenario I remember was the
10 (unintelligible) three quarters out of six and
11 each one of those or he -- he claimed that
12 there were high exposures. I think he was a
13 radium technician. He claimed there were the
14 highest dosed area and each one of those
15 (unintelligible) didn't have data -- no data
16 available. Now, (unintelligible) important.
17 But I think we have to follow up on this.

18 **DR. ULSH:** Okay, Mark. So the action item that
19 -- that -- that we go forward with is to track
20 back and make sure that this -- demonstrate
21 that this procedure actually occurred.

22 **MR. GRIFFON:** Or if possible try to find
23 specific examples.

24 **DR. ULSH:** Oh, some examples. Okay.

25 **MS. MUNN:** I got the impression Mark was

1 particularly interested in the one case where
2 the claimant maintained --

3 **DR. ULSH:** If -- Mark, I can tell you if -- if
4 that situation deals with a claimant it will be
5 fairly easy for us to do I think. If it's not
6 a claimant I don't know that we'll have access
7 to his records.

8 **MR. GRIFFON:** Yeah. I'm not sure about that.

9 **DR. MAURO:** Excuse me. This is John Mauro. So
10 in the case where there was a recording of no
11 data available the position is that the policy
12 was that that probably was some malfunction of
13 the readout. You had mentioned that you would
14 -- you would read it out; there would be some
15 kind of unusually high reading that -- that
16 sort of just didn't seem to make sense. I know
17 this is a great concern to the petitioners.

18 **DR. ULSH:** Yes.

19 **DR. MAURO:** Now, if you were to run this to
20 ground -- in other words, if I was a petitioner
21 and you were to tell me that, well, no, no, no,
22 it wasn't that we just pushed that aside. We
23 have reason to believe that in fact it was a
24 false high reading. I guess how would you go
25 about doing that? Would you go to, for

1 example, other data for where he was and that
2 perhaps area monitors? In other words, how do
3 you convince a claimant or a petitioner that in
4 fact he did not get that dose, that it was a
5 scurrilous high result? What would be done to
6 -- convince me, for example, if I were that
7 person.

8 **DR. ULSH:** Well, we could refer to the
9 procedures that we've referenced here that --
10 that direct the dosimetry group for when this
11 investigation would be triggered and what the
12 outcome would be. We could also look at it's --
13 -- again, if it's a claimant --

14 **DR. MAURO:** Yeah.

15 **DR. ULSH:** -- we could also look in the
16 claimant's record at an investigation report
17 that should be included in there.

18 **DR. MAURO:** The main reason I bring this up is
19 from previous meetings this was -- this was a
20 hot topic.

21 **DR. ULSH:** Yes.

22 **DR. MAURO:** And the degree which we could
23 really run this to ground to the point where
24 the petitioner would feel convinced that yes,
25 in fact your answers are -- make sense. I --

1 I want to just bring our attention to this one
2 item because I know it's sensitive.

3 **MR. GRIFFON:** Yeah, I've heard exactly
4 (unintelligible) John, because it most
5 definitely is.

6 **DR. ULSH:** So the action item is to show a few
7 examples where this occurred, or the cases
8 we're presenting it actually is true.

9 **MR. GRIFFON:** Track specific examples where
10 (unintelligible)

11 **DR. ULSH:** Okay. I'm looking at my guys and I
12 think we can do that but I think Arjun has --

13 **DR. MAKHIJANI:** Yeah, I have a little bit of --
14 of a question on this. I think the explanation
15 that you've given in terms of somebody not
16 handing their badge in because they were sick
17 or not there that day and the badge being read
18 in the next cycle probably applied to many of
19 these cases. But the difficulty here is given
20 the allegation that along with affidavits and
21 specific examples and in one case specific
22 numbers of radiation fields, the -- the problem
23 is to show that it was only the truly odd
24 exception that you could deal with on an
25 individual dose reconstruction, that this

1 wasn't -- that there isn't a systemic problem
2 of fabrication. I think through the petition
3 and the affidavits there's a suggestion of
4 fabrication and I'm wondering -- that's the --
5 so this is -- this is probably a problem and
6 this procedure is a good way to deal with it
7 and I don't have a problem with that. It's --
8 It's knowing that the zero or blank record have
9 all characterized or most -- almost all
10 characterized with this. That's, I think, a
11 little bit more difficult.

12 **DR. ULSH:** Well, the fabrication issue is dealt
13 with in a later comment.

14 **DR. MAKHIJANI:** All right.

15 **DR. ULSH:** How about if we revisit that after
16 we've --

17 **DR. MAKHIJANI:** Sure.

18 **DR. ULSH:** -- talked about that and see if
19 there's still -- So that's the explanation at
20 least that we're providing. The action item is
21 for us to show some examples of this. Okay.
22 Comment number 2. This deals with an
23 allegation by or insertion let's say by the
24 petitioner that tips fell out of the TLD's and
25 readings were not included in workers' records.

1 And they go on to say that they fell on the
2 floor and were lost and were hence never read.
3 This is an affidavit that was in the petition
4 and it was related in this -- this comment
5 here. In our response we say that it is
6 possible that these crystals were read before
7 they were dropped. However, it is also
8 possible that they were dropped before they
9 were read. Now, the -- the question is what do
10 you do in that case. And if you look at page 4
11 of the handout there's a diagram. Jim referred
12 to this earlier. It shows the TLD system at
13 Rocky Flats and what you'll notice is that
14 there are duplicate chips. There are, for
15 example, two TLD 600s. There are two TLD 700s.
16 If one of those chips was lost, as sometimes
17 happened, the dose could be reconstructed,
18 could be read from the remaining chips. So,
19 yes, it is possible that some chips were lost.
20 However, this does not prevent the badge from
21 being read. So that's our response on that.

22 **MS. MUNN:** Is that okay?

23 **DR. ULSH:** So Mark, where do we go with this
24 item? Is it --

25 **MR. GRIFFON:** Yeah, I mean we're just seeing

1 these responses today so --

2 **DR. ULSH:** Well, I understand.

3 **MR. GRIFFON:** Yeah. I would say that it
4 certainly (unintelligible) your response. But
5 --

6 **DR. ULSH:** Could we put that NIOSH has
7 responded and someone will review?

8 **MR. GRIFFON:** Yeah, NIOSH has responded -- you
9 provided a response. And the action
10 (unintelligible) NIOSH from this standpoint
11 (unintelligible)

12 **DR. ULSH:** Comment number 3, it says hair and
13 body oils on the TLD chips cause inaccurate
14 readings. I would agree. When you had
15 contamination on the crystals it could result
16 in anomalously high readings. That is
17 certainly true. Again, when there is a suspect
18 reading on a -- on an individual chip we have
19 duplicate chips. And so I would answer it very
20 much the same way as I did the previous one and
21 that is that we could use the other remaining
22 chips to get a dose estimate from that badge.

23 **MR. GRIFFON:** The only thing I -- I would say
24 if this comment is true is you are referencing
25 these procedures quite often it seems.

1 **DR. ULSH:** Yeah, there's a lot --

2 **MR. GRIFFON:** It might be useful to reference
3 the older ones as well. You can say it wasn't
4 formal but there were existing practices for
5 that.

6 **DR. ULSH:** Okay. We can do that.

7 **MR. GRIFFON:** But to demonstrate that it wasn't
8 merely post-1989.

9 **DR. ULSH:** Sure. As Jim mentioned, the Link
10 and Pennock reference from 1983 won't have the
11 level of detail that the later one did but we
12 can reference both of them.

13 **MR. GRIFFON:** Right.

14 **DR. ULSH:** Sure.

15 **DR. MAURO:** I got a question that links what
16 we're talking about now back to the no data
17 available.

18 **DR. ULSH:** Okay.

19 **DR. MAURO:** According to the no data available
20 there were two times when that would be
21 inserting in a person's record, two conditions.
22 One was when the badge was not returned, okay;
23 and the other was when you got a problem with
24 the dosimeter badge. Now -- But I -- Now, I
25 just heard, though, that there were provisions.

1 The badge had multiple elements so that really
2 you should not have a circumstance where you
3 would get a no data available because of a
4 problem with the badge. But when you say a
5 problem with the badge that means the entire
6 badge? I mean something -- something -- In
7 other words, you didn't just lose an element.
8 You -- You -- Something was wrong with all of
9 the elements on the entire badge and it was
10 just unusable?

11 **DR. ULSH:** No, that's not really what I'm
12 saying. Jim, do you want to --

13 **MR. LANGSTED:** Well, John, you could have
14 everything from, you know, one crystal alone
15 that was resolved on the spot, to multiple
16 crystals that was fairly complex and would have
17 to go to the professional dosimetrists to look
18 at. And in the dosimetry shop where you were
19 trying to turn the results around, you know,
20 like on the two-weekly badges, you were trying
21 to turn those results around and get them back
22 down. Meanwhile the monthlies were sitting
23 there ready to read and the quarterlies were,
24 too. Sometimes the final report would be run
25 even though the dosimetrist hadn't worked out

1 those details yet. And if it required, for
2 instance, going to the supervisor or going to
3 the employee to find out what they were doing
4 and who else was working with them to do a -- a
5 co-worker analysis, so it sometimes was the
6 case where it would take awhile to get
7 resolved.

8 **DR. MAURO:** And this was the fault of dealing
9 with this aberrant situation where you are
10 trying to keep your records?

11 **MR. LANGSTED:** Right. Yeah, you wanted to get
12 the report done and back down to the supervisor
13 so he could manage his group. And it was
14 frustrating from the employee standpoint
15 because they would see no current data
16 available; wait a minute, I turned in this
17 badge. And so -- and the follow-up was
18 definitely not perfect so the employee may
19 never have heard what the final result was.

20 **DR. MAURO:** This is a badge management problem
21 as opposed to this other issue where you have
22 these elements that just were happening due to
23 fallout.

24 **MR. LANGSTED:** Correct.

25 **DR. MAURO:** And you had a backup situation to

1 deal with that?

2 **MR. LANGSTED:** Yeah, yeah.

3 **DR. MAURO:** So that's the distinction. I
4 understand.

5 **MR. LANGSTED:** But the backup may sometimes
6 have taken long enough that, you know, the
7 report went, you know. Finally somebody would
8 make the decision, go ahead and run the report
9 and the -- the five that weren't in there or
10 the one that wasn't in there went in as no data
11 available.

12 **DR. MAURO:** I understand. Thank you.

13 **DR. NETON:** I just had a quick question.

14 **MR. ELLIOTT:** Is it fair to say that a better
15 descriptor of this kind of event -- I guess
16 I've seen at other facilities, INEL one -- is
17 result under investigation. I've seen that
18 entry. Would that be -- have been a better
19 descriptor for this kind of occurrence?

20 **MR. LANGSTED:** In some cases, although in many
21 cases the situation was that the badge had not
22 been exchanged so -- and as we discussed, Rocky
23 Flats did not have a tight exchange program.
24 And if a worker did not exchange their badge on
25 the board --

1 **DR. NETON:** I just had a quick question. At
2 any time did Rocky Flats initiate glow curve
3 analysis capability at all so that you could --
4 you could clearly differentiate these -- these
5 phosphate detergent bars and chemical burns
6 from the TLD's?

7 **MR. LANGSTED:** Yeah, when the -- when the
8 Panasonic system came in in 1989 you had glow
9 curve --

10 **DR. NETON:** And that would clearly be part of
11 the --

12 **MR. LANGSTED:** -- investigation.

13 **DR. NETON:** -- investigation.

14 **MR. LANGSTED:** Exactly.

15 **DR. NETON:** And that would -- that's proof
16 positive at that point --

17 **MR. LANGSTED:** Right.

18 **DR. NETON:** -- that this was not a result of a
19 radiation luminescence as opposed to a
20 chemical.

21 **MR. LANGSTED:** Right. You would look at the
22 glow curve and could see the issue.

23 **MR. GRIFFON:** All right. That's essentially it
24 then.

25 **DR. ULSH:** Okay. That's -- That's comment

1 number 3 about the contaminants on the chip.
2 Whatever designation we're using to mean that
3 NIOSH has turned in a response and, I don't
4 know, you, Mark, or someone's reviewing it.

5 **MR. GRIFFON:** Yeah, I mean I'm keeping track.
6 I'm keeping track of these.

7 **DR. ULSH:** Okay.

8 **MR. GRIFFON:** I would say the only outstanding
9 action item is that NIOSH will provide other --
10 other historical QC references.

11 **DR. ULSH:** Oh, are you talking about the Link
12 and Pennock reference?

13 **MR. GRIFFON:** Yeah.

14 **DR. ULSH:** Okay.

15 **MR. GRIFFON:** I mean that's '83 so it's --

16 **DR. ULSH:** That's on the O drive, Link and
17 Pennock is on the O drive.

18 **MR. GRIFFON:** Yeah. But also that's 1983 so if
19 there's anything -- if it goes back further
20 that would be more helpful. But other than
21 that I would say that response is complete by
22 NIOSH.

23 **DR. ULSH:** So you're looking for an earlier
24 reference than the '83 Link and Pennock?

25 **MS. MUNN:** I think he's asking whether there is

1 one.

2 **MR. GRIFFON:** As best you can, find proof
3 that this practice went -- went back through
4 the program.

5 **DR. ULSH:** We'll take a look, Mark.

6 **MR. GRIFFON:** Yeah.

7 **DR. ULSH:** I'm not aware of any yet but we'll
8 take a look. Okay. Comment number 4. This is
9 the assertion that deliberately false entries
10 were made into dose records. And the comment
11 reads, there's a deliberate falsification of
12 data. For instance a worker alleges that a
13 supervisor would advise the dosimeter worker
14 that the dose shown was too high to possibly be
15 correct, and the worker was advised to change
16 or delete the reading. Further in -- further
17 on in the petition, the worker alleges that
18 zeros were entered into dose records when TLD -
19 - when the TLD reader failed. Okay, our
20 response to this is that both of the situations
21 described in the comment, that is, a worker was
22 advised to correct an anomalously high
23 dosimeter reading; and the second is that a
24 zero was entered into the dose records when a
25 TLD reader failed. Those are both plausible

1 situations that very well could have occurred.
2 However we contend that that does not
3 necessarily constitute deliberate fraud.
4 That's a very serious charge and we've
5 presented -- you're going to notice a lot of
6 the language here is similar between comment
7 responses. That's deliberate. I did that on
8 purpose. There are certainly other
9 explanations and those include what we've
10 talked about; that suspect dosimetry readings
11 were investigated and the conclusion of that
12 investigation could have been that a lower
13 reading was inserted. Now, I would also
14 mention that the Rocky Flats dosimetry program
15 was similar to the dosimetry program at other
16 DOE sites. It was subjected to a number of
17 audits and inspections over the years and that
18 includes both within the contractor
19 organization and outside the contractor
20 organization. We are not currently aware of
21 any findings of systematic fraud. And this is
22 a very serious charge so I would expect that it
23 certainly wouldn't be buried. We have followed
24 up. This ties in with the letter that we sent
25 to the petitioner on March 15th and that

1 Jennifer said the response is on the way. Once
2 we get that letter we will consider it very
3 seriously and look at any of the reports to see
4 if there's evidence of systematic fraud. So I
5 guess the action item, Mark, should be that
6 NIOSH will review the --

7 **MR. GRIFFON:** Petitioner's response.

8 **DR. ULSH:** Exactly. Okay. The next comment is
9 comment number 5 and that is that the petition
10 provides examples of unauthorized work
11 practices, and it says that the data integrity
12 implications of this are unclear. The response
13 -- I took a look at the page that was
14 referenced here and it deals with what the
15 petition called furtive job tasks. In other
16 words, jobs that were performed, and this is a
17 quote, "outside the bounds of normal work
18 controls with no airborne contamination
19 monitoring and with no special worker
20 monitoring." This is a situation where I think
21 we need to differentiate between a regulatory
22 compliance violation and a situation that would
23 prevent NIOSH from doing sufficiently accurate
24 dose reconstructions. If the furtive -- okay,
25 I don't want to say if. These furtive job

1 tasks, which could certainly represent a
2 compliance violation; we're not contending
3 that. But if they were wearing dosimetry we
4 could estimate the doses. So I don't really
5 see, if you grant that these situations
6 occurred, I don't see how that necessarily
7 constitutes an SEC issue. And no evidence is
8 really provided at this point in the petition
9 that would say that NIOSH could not estimate
10 doses even from these furtive job tasks.

11 **MR. GRIFFON:** I think that completes -- Other
12 opinions?

13 **DR. ULSH:** I think you're about to hear one.

14 **DR. MAKHIJANI:** I think the TLD piece of it
15 does address the external dose.

16 **MR. GRIFFON:** Arjun, can you (unintelligible)

17 **DR. ULSH:** Maybe that's not plugged in.

18 **DR. MAKHIJANI:** The -- The TLD piece of
19 Brant's response does -- does -- does address
20 the external dose question in these non-
21 compliant or potentially non-compliant work
22 practices. But there's also the question of
23 the internal dose and those special bioassays.
24 I don't know what the full radionuclide list
25 is.

1 **DR. ULSH:** Okay. My response to that side of
2 it would be very similar. Presumably radiation
3 workers were on routine bioassay programs and
4 so that would be picked up on -- in routine
5 bioassay. In fact, there's an example later on
6 in these comments of exactly that. Whether an
7 intake resulted from a furtive job task or from
8 a normal job task it should show up in a
9 routine bioassay. Now, the problem might be an
10 intake might not be immediately recognized as
11 having happened. For instance one of these
12 furtive job tasks occurred and six months later
13 there was a positive bioassay. It is true that
14 we may not be able to pin this event on this
15 specific incident or a specific job task.
16 However, we have procedures in place by
17 assuming a chronic intake that we would provide
18 a claimant favorable -- claimant favorable
19 estimate from that positive bioassay. So I
20 think the argument is the same for both sides.
21 Assuming that they were monitored that's an
22 integrated measure.

23 **DR. MAKHIJANI:** This is a clarification since -
24 - since I've been through the petition and put
25 this list together. The -- My purpose in

1 putting the list together was to try to compile
2 everything that relates to data integrity and
3 leave it to you to characterize what may or may
4 not be an SEC issue. I wasn't -- I didn't view
5 my job as putting an SEC screen through this
6 list. I viewed my job as simply putting all
7 the data integrity issues on the table as best
8 I could see them. It is a 700-page-odd
9 petition so this was -- this was not -- I
10 can't, you know -- I did the best I could.

11 **DR. ULSH:** Okay. So I think that's our
12 response for this comment, that we don't --
13 NIOSH at least doesn't see this really as an
14 SEC issue. Mark, I don't know where you want
15 to put it in terms of the stage of resolution
16 that we are with this.

17 **MR. GRIFFON:** I think you're complete as far as
18 the response, okay?

19 **MS. MUNN:** Especially --

20 **MR. GRIFFON:** I tend to think you're correct
21 that it doesn't seem like an SEC issue.

22 **MS. MUNN:** Especially for this particular
23 claimant. Radiation control technicians do in
24 fact have specialized training and if anyone is
25 sensitive to the need for badging requirements,

1 it should be a radiation control technician.
2 **DR. ULSH:** Okay. The next comment, comment
3 number 6 found on page 8 has to do with
4 inappropriate subtraction of background in
5 badges. An example is, let's see. The
6 petition claims that there are systematic
7 errors for some workers caused by subtracting
8 too high of a background. This is an issue
9 that we investigated early on and it's somewhat
10 mysterious to us. In order to evaluate this
11 issue we initiated a records review and we
12 looked at approximately 18 boxes of external
13 dosimetry records and those included weekly and
14 monthly status reports from the '50s, '60s, and
15 '70s and some technical documents generated
16 during that period. There was about 500 pages.
17 We didn't find any evidence -- I don't know,
18 there sure seems to be some interference. I
19 don't think it's coming from me but -- We
20 didn't find any evidence of an elevated
21 background problem. And in fact, we talked to
22 four retired dosimetry program managers and
23 none of them could recall this issue either.
24 In worst case what would be required --
25 **UNIDENTIFIED:** Hello?

1 **DR. ULSH:** Hello?

2 **MS. MUNN:** Hello?

3 **(unintelligible)**

4 **MS. MUNN:** Who are you and what are you saying?

5 **DR. WADE:** There's a background discussion
6 going on that we can hear.

7 **(unintelligible)**

8 **MS. MUNN:** They don't care.

9 **DR. WADE:** Okay. We're picking up a background
10 discussion.

11 **(unintelligible)**

12 **DR. WADE:** Okay. Let's continue.

13 **DR. ULSH:** Okay. In the worst case, even
14 though we've not found any evidence of this
15 problem, but if -- if it did in fact occur,
16 what would be required is that we would adjust
17 the ambient environmental dose that we assign
18 during dose reconstruction. So we don't see
19 this really as an issue that would preclude us
20 from doing sufficiently accurate dose
21 reconstruction but I understand, Arjun, that
22 you're just putting everything on the list. So
23 NIOSH contends that we wouldn't classify this
24 as an SEC issue.

25 **MR. GRIFFON:** But is this a question of having

1 the -- the -- the badges, the control badges
2 hung in like a hot area or a (unintelligible)
3 hot area rather than in a -- in an actual
4 controlled area? Is that the issue they're
5 bringing up here?

6 **DR. ULSH:** You do see at the top of page 8,
7 Mark, there are two bullets and it says workers
8 in the building who were not in the back area
9 were receiving unmonitored dose just like the
10 dosimeters on the board. So it could be.

11 **MR. GRIFFON:** Yeah. Okay.

12 **MR. BUCHANAN:** Yeah, this is Ron. I think what
13 they're talking about there is the scale
14 (unintelligible) if you hang the control
15 dosimeter outside the work area and then
16 (unintelligible) and then track that off from
17 the (unintelligible) corporate badge then
18 they're getting cheated on their dose.

19 **MR. GRIFFON:** Right.

20 **MR. BUCHANAN:** But the control badges
21 (unintelligible) put in a background area not
22 subject to any radiation handling issues
23 (unintelligible)

24 **MR. GRIFFON:** I don't see -- I don't see it
25 relevant to environmental -- environmental

1 exposure, to ambient exposure. I mean this is
2 more of a -- I mean that's my statement is what
3 Ron said, this question of how to control --
4 placed too close to the workplace or too close
5 a proximity to the high exposure areas or
6 higher exposure areas.

7 **DR. ULSH:** Right.

8 **MR. GRIFFON:** And therefore you're tracking out
9 more than you should when you're reading. And
10 that's the allegation I guess.

11 **MR. BUCHANAN:** (unintelligible)

12 **MR. LANGSTED:** The research demonstrates that
13 the control badges were not hung with the
14 boards. The control badges in fact were kept
15 in the dosimetry lab and so the fact that that
16 the board may have been in a high background
17 area would have added additional dose to the
18 workers, not subtracted dose via the control
19 badge.

20 **MR. GRIFFON:** Okay. So you're saying the
21 control -- okay. So that (unintelligible)

22 **MR. LANGSTED:** Yeah, that's what all this
23 research that was done looking through the
24 boxes and interviewing the -- the managers was
25 to try to determine if in fact the control

1 badges were there, and the conclusion was, no,
2 they were no.

3 **MR. GRIFFON:** Okay.

4 **DR. ULSH:** I could have made that clearer in my
5 response. I apologize for that. Okay.

6 **MR. GRIFFON:** That's okay. I'm reading as I'm
7 listening, too, so it's kind of -- okay.

8 **DR. ULSH:** Are we -- Are we ready to move on
9 to comment number 7, Mark?

10 **MR. GRIFFON:** Yeah.

11 **DR. ULSH:** Okay. That's found at the bottom of
12 page 8. The comment deals with workers
13 frequently did not wear badges in production
14 area and did not report non-use of the badge.
15 The comment says that this raises the question
16 of how missed dose is to be interpreted. All
17 right. The response is that in a situation
18 where such a practice is alleged -- alleged or
19 suspected we have methods to adjust the
20 recorded dose appropriately. The reference
21 that I would provide here is the External Imp.
22 Guide where we talk about the nearby technique
23 where we can extrapolate from a worker's
24 adjacent monitoring periods. Alternatively we
25 could treat that particular badge reading as

1 suspect, not reliable, and essentially consider
2 the worker to be unmonitored during that
3 period, and we could apply co-worker data,
4 whichever is more claimant favorable, to use
5 the actual badge reading or to use the co-
6 worker approach. Either way I think we've got
7 a bounding technique here for dose
8 reconstruction so I think this might also be a
9 situation where NIOSH would contend that this
10 does not prevent us from doing sufficiently
11 accurate dose reconstructions.

12 **MS. THOMPSON:** This is Jennifer. Can I
13 interject something?

14 **DR. ULSH:** Sure.

15 **MS. THOMPSON:** That assumes that you know that
16 the worker went in without his badge. That
17 assumes the worker remembers every single time
18 he ever went in without his badge and reported
19 diligently that he did that. And that's not
20 the case.

21 **DR. ULSH:** That -- That could very well be
22 true. I don't know how we would identify
23 situations if --

24 **MS. THOMPSON:** It seems many of your answers
25 assume that procedures were followed 100

1 percent -- 100 percent of the time. That also
2 is not the case.

3 **DR. ULSH:** No, I certainly wouldn't -- wouldn't
4 contend that procedures were followed 100
5 percent of the time. There are clear examples
6 where they weren't followed. But my contention
7 is that they wouldn't prevent us from doing
8 adequate dose reconstructions. Now, in terms
9 of how could we identify a situation where this
10 might have occurred, we can look at populations
11 of data certainly and -- and see where there's
12 a tailing off. So in other words, as workers
13 approach the administrative limits in place at
14 the time, what you'll see is that the recorded
15 doses sometimes tail off. Now, there could be
16 two explanations for that. One is that they
17 were approaching the limits and they were --
18 they were restricted from radiation work. The
19 other is that their badge didn't enter the
20 radiation area. In other words, they were left
21 in the locker which is what the contention is.
22 We do have methods to identify situations like
23 that and I think we would rely on those
24 techniques in addition to situations where this
25 was alleged by the worker. In terms of could

1 this ever have occurred and could we detect it
2 in all situations, I think the answer has got
3 to be no. I don't -- I don't think that we
4 could. So this might be an issue for the Board
5 to decide based on this.

6 **MR. GRIFFON:** And again it's a question of --
7 of how frequent the practice was. I mean we --
8 we have the (unintelligible). But it, you
9 know, it's very difficult, especially when,
10 number one, your question here doesn't ask
11 whether anyone didn't wear a badge, you know.
12 And -- But then secondly, it involves
13 survivors that are -- that are going through
14 this process so they -- you wouldn't -- you
15 would never have that (unintelligible)
16 obligation in that case. So, you know, I agree
17 that there's concern here on how this could be
18 used or applied.

19 **MR. PRESLEY:** How many cases do we have in this
20 -- in this category? Did you catch that, Mark?

21 **MR. GRIFFON:** I can hardly hear you, Bob.

22 **MR. PRESLEY:** My question was how many cases do
23 we have in that category.

24 **MR. GRIFFON:** That's what I'm saying. I don't
25 know that we know. I mean I don't know how,

1 you know -- if that's what we're saying, how
2 can -- how can you identify the cases? One is
3 -- Brant just described the -- the methods but
4 it -- it could be that you have real effective
5 controls on the one hand. Or any time they
6 approached their limit they left their badge in
7 the locker is the other possible explanation so
8 they could keep working. And, you know, my --
9 my concern is if you just wait on a claimant to
10 allege that, they generally say that they don't
11 remember when they did those specific, you
12 know, when they did it. And number two, they
13 may not be living or -- or, you know, there may
14 be a survivor situation.

15 **MS. THOMPSON:** Mark, another thing is the fact
16 that the workers are fairly smart, and if they
17 worked in an area where they know it's high
18 rad, they're not going to wait for the end to
19 leave their badge in their locker. They're
20 going to wear it every third day.

21 **MR. GRIFFON:** Right.

22 **MS. THOMPSON:** You know these people. They're
23 -- They're relatively intelligent people.

24 **MR. GRIFFON:** But do you -- do you -- Jennifer,
25 do you know certain departments where they knew

1 that, you know, they didn't want to get shifted
2 out of a certain department because the -- the
3 alternative was a worse option for work? I
4 mean I've heard that several times where I've
5 been that -- that people would do this practice
6 because they didn't want to get shifted to
7 another building where it was going to be, you
8 know, a much harder job, much hotter
9 environment, whatever, you know. A hot -- I
10 talking about temperature hot, you know.

11 **MS. THOMPSON:** Yeah. You actually have several
12 factors that come into play. You know, you
13 have a hot area, say, and so you've got paid
14 for to work in the environment in which you
15 were known to receive radiation exposure so
16 there's a financial incentive to be able to
17 stay in that area. In addition, there is more
18 overtime -- historically has been more overtime
19 given in areas that have the higher rad work
20 and so if you get opted out you can lose a lot
21 of money in overtime pay. So people generally
22 didn't want to get transferred to the cold side
23 because of financial reasons.

24 **MR. GRIFFON:** Right.

25 **DR. ULSH:** One thing I would point out is that

1 --

2 **MR. GRIFFON:** (unintelligible) hot
3 (unintelligible) narrow it down that much.

4 **DR. ULSH:** One thing that I would point out is
5 that after 1964 the TLD or the dosimetry badge
6 was incorporated with the security badge so I
7 don't know that you would have access to these
8 areas if you weren't wearing your badge. Now,
9 before that --

10 **MR. GRIFFON:** Although access to the area,
11 would that necessarily mean they wore it right
12 to their work stations?

13 **MS. THOMPSON:** Yeah. Absolutely not. Your --
14 You only had to have your badge to get in
15 through the outer security gates, not into
16 like, say unless you're (unintelligible) access
17 area.

18 **MS. MUNN:** Oh, my.

19 **MS. THOMPSON:** That was (unintelligible), you
20 know, actually where they separated the
21 dosimeter badge from the security badge, it was
22 security became more strict. And so having
23 them together in the later years your statement
24 would be correct.

25 **DR. ULSH:** Okay. I don't think that at the end

1 of the day NIOSH is going to be able to say
2 with any certainty that when workers
3 deliberately suppressed the readings on the
4 dosimetry badge that we would have a method to
5 correct that -- to catch that in every case. I
6 think that's -- you can always come up with a
7 hypothesis, a scenario where we wouldn't catch
8 it. So --

9 **MS. MUNN:** Especially if --

10 **MR. GRIFFON:** I mean I'm not trying to --

11 **MS. MUNN:** -- the workers were complicit.

12 **MR. GRIFFON:** -- the frequency with which that
13 practice occurred.

14 **DR. NETON:** Deliberate workers (unintelligible)

15 **MS. MUNN:** No. When the worker is complicit
16 in the use then --

17 **DR. ULSH:** So at the end of the day that's
18 where that leaves us. And I think the Board
19 has to decide whether they want to consider
20 this situation to be an SEC issue. I don't
21 know that, Mark, that we're going to be able to
22 get a handle on how often this was done, given
23 the workers' reluctance to talk about it or
24 even maybe their inability to remember when it
25 happened. We do have methods in place to catch

1 it in I contend a great number of cases. Can I
2 tell you that we could catch it all the time?
3 No. I can't say that.

4 **MR. FITZGERALD:** Could I -- Could I just --

5 **MR. GRIFFON:** Jennifer? Jennifer, do you know
6 of -- of individuals that are in the petitioner
7 group that have -- that have more specific
8 examples of when, where? I know that's
9 difficult.

10 **MS. THOMPSON:** You know, and I apologize for --
11 for not remembering but there is a woman from
12 (unintelligible) and Associates that's in town
13 in Denver right now and I believe she's talking
14 to some of the -- the workers about types of
15 issues. And she may be gaining testimony or
16 information that would further elaborate on
17 this right now. I know she's been meeting with
18 several people in the last couple days.

19 **MR. FITZGERALD:** Yeah, Mark. This is Joe.

20 **MR. GRIFFON:** (unintelligible)

21 **MR. FITZGERALD:** Yeah, just -- just to clarify
22 for those around the table that don't
23 understand what's going on. We have Kathy
24 Robertson-Demers pursuing the issue we raised
25 in Boston which is trying to find some

1 substantiation beyond the anecdotes and the
2 allegations, just see if there's anything more
3 concrete that might shed some light on this.
4 And that's what she's doing this week in Denver
5 which is talking to workers, see if there's any
6 corroborating information that we haven't seen
7 so far and to try to add that to the
8 discussions and we'll see what we get. We
9 haven't talked to her yet.

10 **MR. GRIFFON:** Brant, I think that where I'll
11 leave this is that, you know, NIOSH has
12 completed the action but we'll leave the item
13 open as opposed to -- I think several of the
14 other ones we sort of projected that they're
15 not SEC. I think this might be
16 (unintelligible) here pending some of, you
17 know, further specific information if it's
18 available.

19 **DR. ULSH:** Yeah, I think that's probably
20 appropriate and I think we've provided as much
21 as we really will be able to.

22 **MR. GRIFFON:** Right.

23 **DR. MAKHIJANI:** Mark, could I make a correction
24 for the record? This is a minor item compared
25 to -- It says here, the citation in the

1 comment appears to be in error. I don't think
2 it is in error. I've got the petition open. I
3 just -- it's not a quotation from the petition.
4 It was a paraphrase. The petition words are
5 (reading) workers also frequently forgot to
6 wear their dosimeters into the production areas
7 and most would not self-report so doses went
8 unreported. So it -- it was something of a
9 paraphrase but --

10 **DR. ULSH:** Okay. I think it caught the spirit
11 of it. I'll take it back.

12 **DR. MAURO:** This is John Mauro, Brant. You had
13 mentioned, though, that you do have a way to
14 not catch them all but to identify occasions
15 where either it was inadvertent or deliberate
16 where the badge did not go with the person.
17 Now, what I'm hearing, this is a recurring
18 issue. That is, on many occasions we encounter
19 allegations that -- of deliberately not
20 bringing the badge with you for -- for
21 financial reasons that had implications. Now -
22 - But I heard you say something very
23 important, that by reviewing the records there
24 are times when you could discern that there --
25 there's something about the pattern of

1 exposures that would lead you to believe that
2 here we might have a -- a reporting period
3 where the badge did not go with the person. Am
4 I correct that -- that -- that you have a way
5 to -- now, it seems to me that without making a
6 judgment regarding whether it was deliberate or
7 inadvertent, if a sample of records were to be
8 reviewed and you were to use the methodology
9 you described, we could start to get a sense of
10 the prevalence of this type of pattern. And
11 because to me the big -- the bigger question is
12 is it -- is this a widespread issue or not.
13 And I guess to the extent to which there's some
14 metric that could somehow reveal how widespread
15 this is or -- or not, it would be very helpful
16 to not only address the issue as we're
17 encountering it here but as we have encountered
18 it at other -- other petitions and site
19 profiles. Is this something that's doable,
20 reasonable?

21 **DR. NETON:** I'll take -- I'll take a crack at
22 that. I think it is something that is doable.
23 How soon it could be done is another question.
24 I mean, you know, these -- these type of
25 analyses take time. We'd have to pull up the

1 data. I guess, you know, we could -- we could
2 take a quick look at the -- this would only
3 affect workers with fairly significant
4 exposures.

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

6 **DR. NETON:** And our evaluation of records,
7 particularly in the more recent years, there's
8 very few workers that approach the limits.
9 Now, maybe in the very early years when doses
10 were not as well controlled we might have more
11 issues like that but we could look at the tail-
12 off of the cumulative dose on a worker by
13 worker basis to see how many -- how many
14 workers that may have affected. In other
15 words, as -- as the worker approaches the limit
16 does his exposure tail off dramatically at the
17 end which would indicate that the badges were
18 left in the lockers or whatever.

19 **DR. ULSH:** Or that they were pulled out.

20 **DR. NETON:** Or that they were pulled out. It
21 could be either situation but it would give you
22 a handle on the extent of the potential problem
23 as you suggested.

24 **DR. MAURO:** That's what I'm looking for, the
25 extent.

1 **DR. NETON:** We could take a look at that but I
2 couldn't promise that this would be done in --
3 in a couple weeks. That's -- That's the -- as
4 far as I can comment.

5 **MR. GRIFFON:** I think can you give us a -- I'm
6 not sure how to leave that. I think that would
7 be useful, Jim, but --

8 **DR. NETON:** Well, I guess --

9 **MR. GRIFFON:** Again the extent of -- of how
10 much work has to be done.

11 **DR. NETON:** Well, I think that, you know, if --
12 if we leave this as an open item and -- and we
13 -- we list it as one of the potential avenues
14 to pursue we could come back with a better --

15 **MR. GRIFFON:** Give an update on what you find,
16 yeah.

17 **DR. NETON:** Yeah, after looking -- looking at
18 it. And -- And, you know, I'm guessing that
19 it would be possible but oftentimes I'm a
20 pretty bad prognosticator.

21 **DR. WADE:** And again we're going to move into
22 an SEC phase so NIOSH could consider whether to
23 produce such evidence and provide it in the
24 evaluation report or bring it to its
25 presentation at the April meeting.

1 **DR. ULSH:** I can almost guarantee that we will
2 not be able to get it into the evaluation
3 report because that's due to come out within
4 the next week or -- week or so.

5 **DR. WADE:** So again you can consider whether or
6 not you want to bring such evidence to the --
7 to -- to inform the discussion at the end of
8 April.

9 **DR. NETON:** Right. It sounds like SC&A is
10 pursuing this issue from a different attack
11 with the interviews of workers and so it seems
12 like this will be fleshed out in -- in greater
13 detail in the near term.

14 **MR. GRIFFON:** Yeah.

15 **DR. NETON:** And we'll -- I think we should just
16 leave this one path open and look at the
17 tailing as a possibility, as one of the
18 alternatives and if we can fit it in, we will.
19 But if we can't maybe the weight of the
20 evidence on the other issues will -- will help.

21 **MR. FITZGERALD:** Just to -- Just to add a
22 little bit to what we're doing this week, it's
23 really to get a handle on what John was talking
24 about. Whether or not we could provide any
25 substantiation this is systemic and pervasive,

1 not to get more, you know, individual
2 testimonies or affidavits or data items.
3 That's not going to, I think, move us forward.
4 It's to really determine if there's some
5 evidence that this -- this pervades perhaps the
6 operational history and see if there's any
7 documentation to support that.

8 **DR. NETON:** And of course, this would not be
9 informative at all for the workers who -- who
10 assert that they just forgot to wear their
11 badges. That -- That would be independent of
12 the cumulative dose. I would suspect so unless
13 they forgot is a euphemism for didn't wear it
14 because they were approaching the limit.

15 **MR. GRIFFON:** Jim, would this database data,
16 does it have every badge cycle on it or is it -
17 -

18 **DR. NETON:** Yeah, that's a good question. I
19 think with Rocky we've got situations where we
20 only have --

21 **UNIDENTIFIED:** Quarterly.

22 **DR. NETON:** -- quarter -- quarterly data?

23 **UNIDENTIFIED:** Yeah.

24 **DR. NETON:** Yeah. See, we've -- we've
25 attempted to investigate this at the Hanford

1 facility where we had weekly data. It's --
2 It's a -- It, you know, provides for a better
3 analysis so again that's why I'm -- I'm
4 reluctant to say that we can do it for Rocky.
5 We need to take a look and see what -- what can
6 and can't be done.

7 **MR. GRIFFON:** Right.

8 **DR. NETON:** Right. You know, it may be that it
9 can't be done.

10 **DR. WADE:** And this sort of raises a generic
11 process issue -- this is Lew Wade -- that I'd
12 like to talk about a little bit. Again, the
13 Board is going to be sitting with the petition
14 evaluation report in front of it at the end of
15 April and there will be a great deal of
16 pressure on the Board to make a decision at
17 that point. It doesn't mean the Board has to
18 make a decision but there'll be a great deal of
19 pressure. So I think that all of you involved
20 in this process, as you uncover information, I
21 think it would be incumbent on you to share it
22 with the Board as quickly as possible, not to
23 wait until that April meeting so that the Board
24 can have the opportunity of sort of mulling
25 through these things, each individual Board

1 member in their own way as they come to the
2 Denver meeting and decide upon this issue. So
3 again, if we find things from the Demers
4 interviews then we need to be providing them to
5 the Board as quickly as reasonable.

6 **DR. ULSH:** Okay. Unless anything --

7 **MR. GRIFFON:** We're on to item 8 then.

8 **DR. ULSH:** Yes, okay, item 8, good. This
9 comment raises three issues as I count them.
10 The first has to do with geometry. Would a
11 badge accurately -- could a badge result
12 accurately be used to calculate doses for
13 readings that weren't close to the badge.
14 That's issue number one. Issue number two is
15 lead aprons and what effect that might have.
16 And issue number three is what effect might all
17 this have on co-worker data. So let me just
18 walk through those. First of all, it's not
19 clear to us how a badge could not be used to
20 calculate doses to organs far from the badge.
21 And an example of NIOSH's approach for -- for
22 doing this is our glovebox worker TIB where we
23 have badge results in for organs in the lower
24 abdominal -- lower abdominal area. We make an
25 adjustment based on geometry. So we agree that

1 this issue needs to be considered and an
2 adjustment needs to be made; we contend that we
3 can do that and we are doing that. With
4 respect to lead aprons, there's a question
5 about where the badges were worn under the lead
6 aprons or over the lead aprons, and that --
7 that changed throughout time at Rocky Flats,
8 the instructions on that. Lead aprons were
9 available for -- for limited use at Rocky Flats
10 and for most years they were instructed to wear
11 the badges under the lead apron. And in 1992
12 that was changed to instruct the workers to
13 wear the dosimeters outside the lead apron.
14 Now, the issue here is if I'm wearing my badge
15 underneath my lead apron and I get a cancer in
16 an exposed part of my body, say for instance
17 the esophagus, how can we estimate doses for
18 those organs that weren't covered by the lead
19 apron? Well, as it turns out there were field
20 studies performed to determine dosimeter
21 responses in both locations of the film badge,
22 under the lead apron and over the lead apron.
23 And I recall the details for -- for Pantex. I
24 -- Jim, you maybe can correct me about Rocky
25 Flats but I think that if you're wearing the

1 badge under the lead apron the -- the recorded
2 dose was just reduced by a factor of somewhere
3 in the area of 20/30 percent.

4 **MR. LANGSTED:** I don't recall what that number
5 was right off but yeah, there was a measurement
6 done specifically for that.

7 **DR. ULSH:** So I -- I would put this into the
8 category -- I really like John's term of a
9 tractable issue. An adjustment does need to be
10 made and it can be done. It's not -- It's not
11 one of these issues where we can't estimate the
12 effect of -- of lead aprons. Now, I think
13 Arjun wants to (unintelligible)

14 **DR. MAKHIJANI:** Brant, would that -- would that
15 not cut off the shallow dose altogether?

16 **DR. ULSH:** Yes, it seems like it would. So
17 where do you go from there?

18 **DR. MAURO:** So to make it tractable you'd have
19 to have some knowledge on the -- the energy
20 spectrum to which the shielded badge is being
21 exposed to? Then -- Then -- Then we have a
22 tractable issue. I guess that's what -- and --
23 and is it reasonable to assume that you would
24 have that information?

25 **MR. LANGSTED:** Yeah, we should be able to get

1 skin to penetrating dose ratios from co-workers
2 to look at --

3 **DR. MAURO:** Okay.

4 **MR. LANGSTED:** -- in a case like that. You
5 know, this would -- you know, if there were
6 like Brant said a lead apron issue with a
7 cancer outside, that would take some special
8 dose reconstruction outside of the normal
9 process.

10 **DR. ULSH:** Now, the -- the other issue, the
11 question that was raised in the comment --
12 would you want to chip in? I think that -- was
13 that Mark?

14 **MR. GRIFFON:** Nope, I didn't have anything.

15 **DR. ULSH:** Okay. The other question that was
16 raised in the comment is how would this impact
17 on co-worker data. And I think if you give
18 some thought to how we do co-worker data I
19 think the conclusion you can come to is that it
20 wouldn't affect it because what we do when we
21 assign co-worker data, we use co-worker data to
22 get whole body doses to assign to an
23 unmonitored individual. Once that assignment
24 has been made for a whole body dose we then go
25 on and apply dose -- dose conversion factor,

1 organ specific dose conversion factors. So I
2 don't think that this would have implications
3 for the co-worker data.

4 **DR. MAKHIJANI:** If -- If the lead apron
5 problem was there for most of the time or much
6 of the time, then how do you estimate the co-
7 worker doses for -- for the shallow dose?
8 Because the whole body dose is not going to
9 give you that number unless you have an
10 explicit study for the inside the apron and
11 outside the apron when the shallow dose
12 recorded and comparable radionuclide situations
13 like, you know, the americium percentages
14 controlled and so on. You wouldn't know what
15 to do.

16 **DR. ULSH:** Keep in mind that lead aprons were
17 used on a very limited basis so when we're
18 talking about co-worker data, the impact that
19 that might have on the entire data set I think
20 would be pretty small. And as Jim mentioned
21 earlier we could use co-worker data to get the
22 ratios of penetrating to shallow dose and apply
23 those to the individual. I think, Jim, do you
24 want to --

25 **DR. NETON:** Well, I -- I just have a question

1 really to Jim's comment that your recollection
2 was that the difference was on the order of
3 only 30 percent?

4 **(unintelligible)**

5 **UNIDENTIFIED:** I don't recall.

6 **DR. NETON:** It seems to me that if Rocky were
7 wearing lead aprons it was mostly in response
8 to protection to (unintelligible) of photons,
9 things like plutonium. And I would suspect
10 that a lead apron would have a much larger
11 correction factor than -- than about 30
12 percent. So I think the answer is we would
13 know what the correction factor would be and --
14 and the low energy dose, the shallow dose would
15 be relevant to the 17 keV (unintelligible)
16 which would be applied. So I think we have a
17 handle on that unless you've got a unique
18 situation where there are pure beta particles
19 which, you know, I'm not sure there are that
20 many at Rocky Flats. I think that the issue
21 can be dealt with with these geometric
22 correction factors for apron usage. I would
23 have to look at the study but I would suspect
24 that they -- they evaluated it, you know, 17
25 keV exposure with and without the lead aprons.

1 So we -- we need to take a look at that and
2 maybe get that report back on -- on how that
3 would be dealt with.

4 **MS. THOMPSON:** This is Jennifer. I'd like to
5 provide clarification. Somebody said that lead
6 aprons were used on a very narrow basis at
7 Rocky Flats and I know that -- that site
8 profile didn't include analysis of more recent
9 operations at the site. But many of the rescue
10 processing operations where we were doing the
11 repackaging on 106 metric tons of residue at
12 Rocky Flats involved the use of lead aprons.
13 And so, you know, that needs to be reflected in
14 -- in whatever -- whatever you think you can do
15 to adjust for that.

16 **DR. NETON:** Jennifer, what time period was
17 that?

18 **MS. THOMPSON:** 1995 to the end of probably
19 2003.

20 **DR. NETON:** Right. I think the response
21 indicated that the lead aprons -- or the badge
22 was worn outside the lead apron after 1990-
23 something.

24 **MS. THOMPSON:** But the response was that the
25 procedure required it to be worn outside but

1 many people still wore it under because they
2 had always done it that way. And just because
3 a procedure was changed doesn't mean actual
4 practice changed.

5 **DR. NETON:** Okay.

6 **MR. BUCHANAN:** This is Ron. At the Pantex
7 plant for '95 (unintelligible) had an overall
8 reduction in photon dose of 57 percent and the
9 neutrons I want to say (unintelligible)
10 percent. And so the neutron dose
11 (unintelligible) of course but (unintelligible)

12 **MR. DEMAIORI:** This is Tony DeMaiori with the
13 Steel Workers. I have Jerry Harden with me.
14 And I apologize to you. We were working with
15 Kathy Demers going through our records. I'd
16 like Jerry to speak on what I brought up in the
17 last Board meeting about people not wearing
18 their dosimeters and the people putting their
19 dosimeters on -- on high dose material to
20 verify the -- well, basically the dosimetry
21 program. So I'm going to turn this over to
22 Jerry right now. Thank you very much. Jerry?

23 **MR. HARDEN:** What is it that you want to know
24 from me?

25 **MR. GRIFFON:** Well, we're going back in action

1 items that we already discussed I think but the
2 -- the question was -- that has come up in the
3 petition, we referred that at least some
4 workers have alleged they might have left their
5 badge outside of areas and worked in hot areas
6 for -- or as Tony just said, might have even
7 put their badge in a hot drum of some sort to -
8 - to sort of test the program to see if they
9 were actually measuring doses. We were looking
10 for specific examples of where that might have
11 happened or how frequently.

12 **MR. HARDEN:** I don't know about the frequency.
13 I know one specific case that occurred in the
14 late '60s. A deceased worker named O.G. Fergus
15 (ph). And let me explain the motive why a lot
16 of people would attempt to do what we're
17 talking about today. It was about the money,
18 honey, or they might lose their shift or their
19 various other motivators. And with Fergus, he
20 was rotated out 774 building, which was a
21 parking lot for -- for high dose workers and
22 moved into 71 building. So he assumed if he
23 put his badge on a -- a can of oxide that that
24 would load his badge and consequently elevate
25 his numbers where he would be reassigned back

1 where he wanted to be. And I can't name all
2 the people that I suspect might have been
3 involved in either, you know, skewing the data,
4 you know, less that it ought to be or more, but
5 I -- I do know that case to be a valid one.

6 **MR. GRIFFON:** And in that case he wanted to go
7 back into the --

8 **MR. HARDEN:** From 71 building production back
9 into the 74 building.

10 **MR. GRIFFON:** But he was trying to back out
11 of... Well, thank you.

12 **MR. HARDEN:** And that's all?

13 **MR. GRIFFON:** Well, that's the main thing I
14 needed. If there's any other specifics you can
15 give and -- and more so you mentioned the money
16 incentive.

17 **MR. HARDEN:** Well, it wasn't just that. You
18 had the possibility of pregnant females. You
19 had all kinds of things and people would lose
20 their good deal kind of things potentially, you
21 know, in the -- Most everyone tries to work
22 themselves, you know, into a comfortable place
23 on the porch. That's what this boils down to
24 because people were very sensitive on goals.
25 And you had like with production welders where

1 they were eyeball to eyeball with the -- you
2 know, our product, you had to do a lot of
3 folks. And they did finally rotate it to
4 another building. And again I don't want to
5 put names on tables because I don't have hard
6 evidence, but the Fergus case I think is
7 relatively solid or was during my last
8 awareness. So it isn't like, you know, this is
9 just fantasy. Keep in mind that I was a grunt,
10 radiation grunt at Rocky Flats. I wasn't up in
11 the -- you know, in the palace so I'm sure that
12 the people in some of those departments have to
13 know way more of these specifics than I do.

14 **MR. GRIFFON:** Okay. Well, thank you. That's
15 what we -- when we say specifics we -- we don't
16 necessarily mean names.

17 **MR. HARDEN:** Yeah, you do because it looks to
18 me like we're chasing a lot of
19 (unintelligible). I'm not just blowing smoke
20 in any part of your anatomy. I'm -- I'm out
21 here with the real deal. And my interest is of
22 a concerned worker of 37 years duration at
23 Rocky Flats and I've made a long list of people
24 that never lived long enough to get their first
25 pension check. So I am very emotional and very

1 aggressive about trying to get something done.

2 **MR. GRIFFON:** Well, we --

3 **MR. HARDEN:** Hopefully you share that. Maybe
4 you don't and I guess we'll be at odds
5 somewhere down the road.

6 **MR. GRIFFON:** No, we do share that. We
7 appreciate your comments. All I was going to
8 say is if you have more specifics it might be
9 useful to give them to Tony and maybe not bring
10 names up on the open line on the call but we --
11 we do want -- the more specific we can have the
12 better we can track it back.

13 **MR. HARDEN:** And -- Now, who are you, sir?
14 You know who I am.

15 **MR. GRIFFON:** My name is Mark Griffon and I'm -
16 - I'm with the Advisory Board. I'm chairing
17 this work group.

18 **MR. HARDEN:** I see.

19 **MR. GRIFFON:** And then there's a bunch of folks
20 in Cincinnati from NIOSH and from SC&A and from
21 ORAU, the contractors that are working on this
22 project.

23 **MR. HARDEN:** Okay.

24 **MR. GRIFFON:** There's a whole lot of people on
25 this phone call. The Advisory Board is

1 chairing this particular meeting.

2 **MR. HARDEN:** Well, all I can do is tell you to
3 do more and do it quickly.

4 **MR. GRIFFON:** All right. Well, we appreciate
5 that.

6 **MR. HARDEN:** All right.

7 **MR. GRIFFON:** We are trying.

8 **MR. HARDEN:** Do you want to talk to these
9 people? Tony has no further comment for you
10 today.

11 **MR. GRIFFON:** All right. All right, thank you.

12 **MR. HARDEN:** Yes.

13 **MR. GRIFFON:** Well, we'll get back to -- Brant,
14 where were we? On 8?

15 **DR. ULSH:** I think we've gone through item 8,
16 Mark.

17 **MR. GRIFFON:** Yeah.

18 **MS. MUNN:** (unintelligible)

19 **MR. GRIFFON:** I think one item there to follow
20 up -- you had mentioned that -- follow up on --
21 on something about how you were going to go
22 about (unintelligible)

23 **DR. NETON:** Well, we're going to value -- is
24 that the one we were going to look at the
25 tailing off of the cumulative dose?

1 **DR. ULSH:** No, that was (unintelligible)

2 **DR. NETON:** We're moving on to the -- the lead
3 apron?

4 **MR. GRIFFON:** Yeah.

5 **DR. NETON:** Yeah, we need to take a look -- a
6 closer look at that report that was done -- the
7 evaluation that was done with lead apron usage
8 and the reduction in dosimetry.

9 **MR. GRIFFON:** Okay. I think we're on 9.

10 **DR. ULSH:** Okay. Item 9 deals with an
11 affidavit from the petition under the heading -
12 - under the heading of missing dose record in
13 areas of high exposure. One worker has
14 provided an affidavit saying that a year's dose
15 record is missing from a time that he worked in
16 a high radiation area. He was a rad control
17 technician and he gave the specific location,
18 and he says that he was not rotated out of the
19 area since he was a rad control tech. This
20 goes back to an unmonitored radiation worker.
21 If this occurred then we would use the
22 techniques that I've mentioned earlier where we
23 would interpolate from adjacent monitoring
24 periods if the job was the same. Or
25 alternatively we could conduct a co-worker dose

1 reconstruction.

2 **MR. GRIFFON:** This was actually -- this was
3 being implemented (unintelligible) earlier.

4 **DR. ULSH:** Yeah, it sounded familiar, Mark, but
5 I couldn't pin it down so I knew it was in
6 there somewhere.

7 **MR. GRIFFON:** It might be (unintelligible)

8 **DR. ULSH:** I think it --

9 **MR. GRIFFON:** If it was a claimant his files
10 are available.

11 **DR. ULSH:** I think I checked on this and this
12 guy's not a claimant so I don't know that we
13 would have access to his records but the
14 response is that we do have methods to handle
15 situations like this. I mean he would be an
16 unmonitored worker essentially for this period
17 and so I think we would apply co-worker models
18 or use the nearby technique as laid out in the
19 External Imp. Guide.

20 **MR. GRIFFON:** I wonder if -- if this person is
21 in the (unintelligible) they may have access to
22 their own personnel file.

23 **MR. LANGSTED:** It would have been requested.

24 **MR. GRIFFON:** (unintelligible)

25 **DR. ULSH:** Jim Langsted says that they probably

1 would if they requested it from DOE. Yeah, it
2 might -- it might not be able to be done in a
3 timely manner. I -- I --

4 **MR. GRIFFON:** And your -- your -- NIOSH's
5 program doesn't (unintelligible) other
6 individual records as part of the overall
7 model?

8 **DR. ULSH:** We certainly have access to de-
9 identified data but I don't know about chasing
10 the individual data for other people that
11 aren't claimants.

12 **DR. NETON:** I think we need to check into that
13 because it's my opinion that we've got usage.

14 **MR. ELLIOTT:** (Unintelligible) takes us beyond
15 the claimant's file, ask for data by co-worker
16 data and build a data set.

17 **MR. GRIFFON:** I didn't hear that.

18 **DR. NETON:** That was Larry Elliott --

19 **MR. GRIFFON:** Oh.

20 **DR. NETON:** -- speaking but, you know, we have
21 a MOU with DOE that I believe will allow us to
22 go beyond just the broad data that we're
23 requesting for the workers and that is to
24 obtain additional data for example to develop
25 co-worker models. So it's not clear to me that

1 we couldn't get this. I'm not saying we can
2 but we'd have to check with our legal folks and
3 others and make sure that it's -- it's
4 appropriate but I think it's something that
5 would be worth pursuing.

6 **MS. MUNN:** The question --

7 **MR. GRIFFON:** The only reason I'm raising it is
8 because it's a very specific one and might be
9 very useful.

10 **DR. NETON:** I agree with you, Mark. I think if
11 we could -- if we could investigate this
12 specific case -- again and make sure it's
13 possible but if it were I think it would be
14 worth looking at. I might say even if we can
15 though, we might not be able to get these --
16 these records in a timely manner.

17 **MR. GRIFFON:** Right.

18 **DR. NETON:** It might take more than a week or
19 two even -- even if we have the authority to
20 request that.

21 **MR. GRIFFON:** Okay.

22 **MS. MUNN:** It's unclear to me, however, if this
23 person is not a claimant how this affects the
24 SEC.

25 **MR. GRIFFON:** Well, it's the -- it goes back to

1 the overall allegation, the no data available
2 with regard to the database that did use the
3 co-worker model.

4 **MS. MUNN:** So we're extrapolating the
5 allegation to include more than this worker?
6 Is that what I'm hearing?

7 **MR. GRIFFON:** My understanding that was a
8 broader allegation as to the specific affidavit
9 -- affidavit provided in -- as part of the
10 petition. But the allegation was broader.
11 They didn't just say one person said they had a
12 record where there was no data available; they
13 made a broader allegation. This was one
14 affidavit that was very specific to that -- to
15 that issue.

16 **MS. MUNN:** I guess I'd have to go back to the
17 CD and look at the (unintelligible)

18 **MR. GRIFFON:** And that was my understanding.
19 If the others -- if the others remember this
20 differently I'm --

21 **DR. MAKHIJANI:** Yeah, Mark. This is Arjun.
22 Ms. Munn, that is -- Mark is right. The
23 petition is fairly complex but part A of the
24 petition in certain portions raises many of
25 these issues. And then I think these

1 affidavits in part B are kind of collectively
2 individual examples demonstrating that the
3 allegations are real although, you know, the
4 specifics and generalities mixed in both parts.

5 **MS. MUNN:** Yeah, I'll go back and look at it.
6 It just seems unusual to have a non-claimant --
7 I'll go back and look at it again.

8 **DR. ULSH:** Okay. Number 10. This comment
9 deals with the bioassays were redone when they
10 indicated high exposure. There are two
11 examples that are cited. They claim that
12 bioassays were redone for individuals and that
13 they were recounted when the readings were
14 high, and subsequent results were declared as
15 having no exposure or false positives. This --
16 One of these examples is cited as important to
17 the basis for the petition. So I'd like to
18 walk through these examples. The first one is
19 found in part A, page 47 of the petition. It
20 gives several details. According to the
21 petition the urine samples were positive for
22 plutonium, were collected in July of 2003 and
23 also later that year in September and December
24 of 2003. And it states that there were also
25 earlier positives in 2001 and '02. And it

1 states in here than an investigation was done
2 by internal dosimetry including follow-up
3 samples that were below the decision level and
4 concluded that the 2001 and '02 samples were
5 false positives. In our response we have cited
6 a -- the Rocky Flats procedures that govern
7 investigation of positive bioassay results, and
8 that procedure states that an intake is
9 considered confirmed if one of the follow-up --
10 if one of the follow-up samples shows
11 detectible levels of activity not associated
12 with background or previous intake following a
13 workplace indicator which exceeds the action
14 levels. So that is pretty much exactly the
15 situation that's described in the example.
16 However, I would point out that the example
17 does not present any evidence that the
18 conclusion that these were false positives was
19 in error. The petition goes on to contend that
20 the likely explanation is that it says, "it is
21 probable that the detection of plutonium 239
22 and 240 at this time is the result of improved
23 sensitivity in laboratory analysis and that
24 there were small amounts of plutonium in the
25 urine from old intakes that were only recently

1 detectible." I agree that's a plausible
2 explanation and that actually supports NIOSH's
3 dose reconstruction methods in that when a
4 bioassay result comes back negative we apply
5 missed dose so for those early time periods it
6 could very well be the case that there was
7 small amounts of plutonium present. It showed
8 up as a below the limit of detection and we
9 applied missed dose. And it's exactly for that
10 reason that if you were to use more
11 contemporary, more sensitive methods perhaps
12 there would be a detectible level there. And
13 that's exactly the justification for assigning
14 internal missed dose. So I don't see that that
15 presents a basis for concluding that we
16 couldn't do accurate -- sufficiently accurate
17 dose reconstructions. Now, the second example
18 also gives a number of details here. That
19 there was an incident which resulted in the
20 contamination of a worker. The worker was
21 apparently wearing a respirator at the time.
22 The petition says that a lung count was taken
23 and -- and was positive and a second lung count
24 was taken and it was concluded that the first
25 lung count was a false positive. And then the

1 worker states that eight years later he was
2 given a dose for this incident and he states
3 that he gave three fecal samples a number of
4 years later, all of which gave positive
5 results; and to his knowledge he had not been
6 involved in other incidents. Again I would say
7 that no evidence is provided that the
8 conclusion that the first lung count was
9 positive -- was a false positive, that that was
10 in error. And I would say that this is exactly
11 the justification for routine bioassay programs
12 because workers may not be aware that they have
13 had an intake unless -- at the time it occurs.
14 And that's the reason that they do routine
15 bioassay programs is to detect situations
16 exactly like that. So I don't think -- in the
17 absence of evidence that the conclusions of
18 false positives were in error I don't see that
19 these examples support the conclusion that we
20 can't do sufficiently accurate dose
21 reconstructions. That's the end. That's my
22 response, Mark.

23 **MR. GRIFFON:** Yeah, I don't think your -- I
24 mean I don't think (unintelligible) further
25 action --

1 **DR. ULSH:** Okay.

2 **MR. GRIFFON:** On NIOSH's part. Now, it seems
3 like the model -- the approaches that are being
4 proposed would adequately address the situation
5 but I mean I'm not going to (unintelligible)
6 reading while you're talking.

7 **DR. ULSH:** Okay.

8 **MR. GRIFFON:** That's my general sense. I don't
9 know if SC&A has any comments on that.

10 **DR. MAURO:** No.

11 **DR. ULSH:** I don't think so.

12 **MR. GRIFFON:** Well, we can leave it that the
13 NIOSH action is completed at this point you
14 know, no further action.

15 **DR. MAURO:** I'm sorry. This is John Mauro.
16 You had mentioned that there was no evidence
17 that the circumstance that was being alleged
18 occurred. And namely that -- that the false
19 positive was in fact not a false positive. How
20 would you I guess -- I'm just trying to think
21 of what would be in the record that would
22 individual that -- is it the follow-up or is
23 the follow-up -- let me see. Let me just think
24 it through. So a person has a -- a chest count
25 or a bioassay. Get a high result. Automa--

1 One of the things that's done as part of your
2 procedure is to follow up, and when the follow-
3 up is done you go -- you don't see it again.
4 And -- And that is your evidence that in fact
5 the original one was a false positive so that's
6 where it ends.

7 **DR. ULSH:** You're essentially correct. It's
8 actually stated in the opposite case, that the
9 intake is confirmed if one of the follow-up
10 samples shows up positive but you could -- you
11 do have the right interpretation there I think.
12 Okay. Then that takes us to comment --

13 **MR. GRIFFON:** I think the -- the most important
14 part of that whole thing, you said it, Brant,
15 to me, that you're -- when your zero or unless
16 it's detectable (unintelligible) approach,
17 right?

18 **DR. ULSH:** Right.

19 **MR. GRIFFON:** So we're going to be
20 (unintelligible) anyway so I think that's an
21 important part of the statement.

22 **DR. ULSH:** Unless there's further discussion on
23 that we can go to comment number 11.

24 **MR. GRIFFON:** Okay.

25 **DR. ULSH:** Okay. And that's under the heading

1 of instances of no data available in situations
2 of high exposure. We've talked about this
3 somewhat already, this no data available issue.

4 **MR. GRIFFON:** Right.

5 **DR. ULSH:** The comment says that there is, for
6 instance, an affidavit stating that no data
7 available was entered into their record despite
8 the fact that the film badge was blackened with
9 exposure and the work was in a high exposure
10 area, americium 241 processing. And by
11 contrast the petitioner -- the affidavit in the
12 petition contends that there were entries for
13 positive dose when the worker was serving in
14 the military in Korea which would certainly be
15 troubling. I think we've talked about the no
16 data available --

17 **MR. GRIFFON:** Is this another individual? I
18 think he --

19 **DR. MAKHIJANI:** Mark, I think it's the same
20 one.

21 **MR. GRIFFON:** Is it?

22 **DR. ULSH:** Well, let's take a look over on page
23 13. There's actually a copy of the affidavit
24 that I redacted from the petition and if you
25 look in the first paragraph of his affidavit he

1 says that when they did my dose reconstruction
2 for the neutrons they included May 1963 to May
3 1965. I was on active duty in Korea and had
4 handled no radioactive material while I was
5 away from Rocky Flats. So and then the no data
6 available issue is brought up a few paragraphs
7 down. But I want to focus on the Korea
8 situation here. If you look at the next page,
9 page 14 in the handout, what you'll see here is
10 the employee record card for this individual
11 and if you look about halfway down in the third
12 column, the column that's titled released,
13 you'll see a date for 4/19/63, so April 19th,
14 1963. And the card does show that he quit with
15 notice. He was entering the military service.
16 So he worked for part of the year, the first
17 part of the year in 1963 and then he entered
18 the military. A couple lines down you'll see
19 an entry under the hired column, 5/17/65 he was
20 rehired. So this does agree with his affidavit
21 that he worked a partial year in '63, was not
22 there in '64 and worked a partial year in '65.
23 Now, in his affidavit he also contended that he
24 received neutron dose for this period. Page 15
25 of the handout is a copy of the NDRP data sheet

1 for this individual and what you'll see is that
2 there is a dose in 1963 assigned. There is a
3 dose in 1965; and there's no dose in 1964.
4 This is entirely consistent with partial year
5 employment in '63 and '65 and no employment in
6 '64. So I would contend that this is not an
7 SEC issue.

8 **MR. GRIFFON:** It also shows let me add an
9 annual dose that you mentioned, not both -- not
10 broken down further, right? But it does
11 support -- It does support -- I mean that's
12 certainly a possibility (unintelligible)

13 **DR. ULSH:** Okay. So unless there's further
14 discussion on that one I'd move on to comment
15 12. Can we consider that one closed?

16 **MR. GRIFFON:** This person's obviously an
17 individual that's a claimant, correct?

18 **DR. ULSH:** Pardon me?

19 **MR. GRIFFON:** This -- This is a claimant?

20 **DR. ULSH:** No, in fact this is not a claimant.

21 **MR. GRIFFON:** Then (unintelligible) the
22 records.

23 **DR. ULSH:** I have the NDRP sheet. But I don't
24 have any other --

25 **MR. GRIFFON:** You have his service records and

1 all that.

2 **DR. ULSH:** Yeah, that was included as part of -
3 - was this from the NDRP, Roger?

4 **MR. FALK:** Yes.

5 **DR. ULSH:** Okay. This -- This was from the
6 NDRP. But I don't have, you know, the typical
7 records that we have for a claimant, you know,
8 the extensive dosimetry records or anything
9 like that.

10 **MR. GRIFFON:** I was just curious. You seemed
11 to get the records. Okay. I would add the
12 same action to this one. If possible can you
13 track this person back and is their data
14 available because I figure it is a different
15 position. He doesn't make a specific claim
16 though but --

17 **DR. ULSH:** Okay. Yeah. We can put that -- let
18 me see now. Working in the americium line. We
19 can try it. We'll -- We'll take a look at it,
20 Mark.

21 **MR. GRIFFON:** It's not a specific
22 (unintelligible). If it's possible.

23 **DR. ULSH:** Okay. Comment number 12. Most
24 exposed workers were not monitored for neutrons
25 and the petition cites Roger Falk who is

1 sitting here at the table, saying that until
2 July 1958 the most exposed workers were not
3 monitored for neutrons, raising a question of
4 how the neutron data and the NDRP study are to
5 be used even if the re-reading of the badges is
6 accepted as sound. In the -- In the response
7 we're contending that the neutron doses can be
8 reconstructed based on neutron dosimetry if
9 it's available as adjusted by the NDRP. And
10 that if it is unavailable we can use neutron to
11 gamma ratios to calculate neutron doses.
12 Regarding the last sentence, the last part of
13 the comment, even if the re-reading of the
14 badges is accepted as sound, NIOSH is not aware
15 of any evidence that would call into question
16 the soundness of the re-reads of the NDRP so I
17 don't see this as an SEC issue. However,
18 Arjun's reaching for the microphone.

19 **DR. MAKHIJANI:** Yeah. No, no. I -- There
20 wasn't any implication that the reading wasn't
21 sound. I just wanted to make sure that that
22 wasn't an issue in this -- in this thing. That
23 the only issue in this context was Roger Falk's
24 statement that the most exposed people were not
25 monitored. So that whatever the resolution of

1 all the NDRP issues, that should be set aside
2 in -- in responding to this. That was the only
3 implication that I had comment. But -- But
4 the question is I don't know what the origin of
5 that statement was and how -- how these -- how
6 the neutron co-worker set is to be constructed.

7 **MR. FALK:** This -- This statement was taken
8 from my presentation to the Rocky Flats DOE in
9 1994 of the results of the pilot study that we
10 did to scope out the -- the nature of the
11 neutron dosimetry problems in the '50s and
12 early '60s. And then also to actually present
13 what we needed to do about that. And that was
14 the start of the neutron dose reconstruction
15 project. And that I think has basically
16 addressed all the issues that we found in the
17 pilot study.

18 **DR. MAKHIJANI:** Including -- Including this
19 one? Ron -- Maybe Ron knows the answer to
20 this. I have not carefully gone over the NDRP.
21 But including this problem that the workers
22 that were monitored were not the most exposed
23 ones?

24 **MR. FALK:** Yes, because we basically assigned
25 what we called the no show dose to the people

1 who were not monitored based on the methods
2 that are described in the protocol, especially
3 the section -- especially -- especially section
4 11 of the protocol.

5 **MR. BUCHANAN:** This is Ron. Yes, this is
6 exactly the question I have of my three
7 questions that we were going to get to later;
8 this is number one, was addressing the workers
9 that were not monitored in the early '50s which
10 were asking folks to -- neutron radiation. And
11 I realize, you know, one of the statements is
12 that they monitored everybody (unintelligible)
13 ten percent of the radiation techs got at that
14 time. However, there was only 10 to 18 badges
15 each during this seven-year period in the early
16 '50s and those (unintelligible) during the
17 '56/'57 time frame I believe, that area. And
18 so my question is number one I guess
19 (unintelligible) here in reconstructed dose for
20 these radiation workers in the early '50s you
21 don't have you've got co-worker information
22 (unintelligible) badges (unintelligible)
23 neutrons. How do we know that -- that they
24 didn't get over ten percent of the -- allowed
25 limit because (unintelligible) the way I

1 understand it if you're going to reconstruct
2 (unintelligible) for people that weren't
3 badged, they would get ten percent of their
4 (unintelligible) limits or (unintelligible) 600
5 a year -- 600 millirem per year. However, you
6 might have radiation workers exposed to
7 neutrons that weren't recognized at that time
8 that weren't badged. We could have radiation
9 workers that got, you know, more than ten
10 percent. How -- How do these workers get
11 identified and assigned a dose greater than
12 this (unintelligible) values and
13 (unintelligible)

14 **MR. FALK:** What we did is we went back to the
15 rosters --

16 **MR. BUCHANAN:** Roger, could you get a mike? I
17 can't hardly hear you.

18 **MR. FALK:** I thought I had a mike.

19 **UNIDENTIFIED:** Get real close.

20 **MR. FALK:** What we did is we were really
21 concerned about the workers in building 71
22 which was chemical processing and also the
23 plutonium metal working area in the '50s. And
24 what we did is we got the building rosters.
25 And also -- also during that time I think

1 essentially all of the workers were monitored
2 at least for the gamma exposures. And so we
3 did have the gamma data, the whole body
4 penetrating gamma. So what we did is we
5 applied a neutron to gamma ratio based on the
6 chemical processor -- process operators in 1959
7 and we used that to -- to -- to then establish
8 the no show dose for -- for the building 71
9 workers who were not monitored for the
10 neutrons.

11 **MR. BUCHANAN:** And this dose could exceed the
12 ten percent of the 600 millirem per year as
13 described in the -- the external TBD section
14 6.9 seems to limit it to around 1.2 rem per
15 year but on an individual case basis. It could
16 be higher than that if they were -- were
17 exposed to work which was perhaps
18 (unintelligible); is that correct?

19 **MR. FALK:** When we did the NDRP project we did
20 not pay any attention to the ten percent. We
21 just -- We just multiplied the gamma dose
22 which was required for them by the neutron to
23 gamma ratio.

24 **MR. BUCHANAN:** Okay. I can't -- when the dose
25 reconstructor (unintelligible) person -- when

1 the dose reconstructor reconstructs
2 (unintelligible) dose, if he could not come
3 under the NDRP (unintelligible), what would be
4 done about assigning missed dose.

5 **DR. ULSH:** This is Brant.

6 **MR. ROBINSON:** This is Al.

7 **DR. ULSH:** Okay. Good.

8 **MR. ROBINSON:** Based (unintelligible) the NDRP
9 study and --

10 **DR. ULSH:** Al? Al?

11 **MR. ROBINSON:** -- the neutron dose refers --
12 its dosimeter report outside the study that we
13 -- we would assume that he did not get any
14 neutron dose. So that -- and we -- so we would
15 apply that (unintelligible)

16 **DR. NETON:** Who was that?

17 **DR. ULSH:** That was Al Robinson. Al, you might
18 be on a speakerphone. It's hard for us to make
19 out your entire comment. Could you --

20 **MR. ROBINSON:** Is this better?

21 **DR. ULSH:** Marginally.

22 **MR. ROBINSON:** How about this?

23 **DR. ULSH:** That's better.

24 **MS. MUNN:** Yes.

25 **MR. ROBINSON** Is that better?

1 **DR. ULSH:** Yes.

2 **MR. ROBINSON:** Yeah, I've had a terrible time
3 hearing, too, I've had the speaker up to my
4 ear. Basically if -- if the worker was not
5 included in the NDRP study and there's no other
6 extraneous evidence, you know, that he would
7 have had neutron dose then we would apply only
8 penetrated photon dose with 600 millirem, if
9 there was no other dose for that year. So we
10 would rely to a large degree on the NDRP study
11 to tell us that that person either had neutron
12 dose on either side of -- of some gap that
13 might be in there or -- or his work
14 location/(unintelligible).

15 **DR. ULSH:** Ron, Ron.

16 **MR. BUCHANAN:** Yeah.

17 **DR. ULSH:** We can barely hear you again. Can
18 you get closer?

19 **MR. BUCHANAN:** Okay. Can you hear me now?

20 **DR. ULSH:** Yup.

21 **MR. BUCHANAN:** Okay. The NDRP covers
22 (inaudible)

23 **MS. MUNN:** You're fading in and out again.

24 **MR. BUCHANAN:** (inaudible) Okay. Can you hear
25 me here?

1 **DR. ULSH:** Oh, yeah.

2 **DR. NETON:** Very loudly.

3 **MS. MUNN:** Very loudly, clearly.

4 **MR. BUCHANAN:** Okay. I understand that NDRP
5 pre-read all the film badges, MDA film that was
6 available that's re-readable whether they were
7 plutonium workers or not. Now, I guess where
8 I'm still unclear is they -- they didn't
9 (unintelligible) in the early '50s. So if they
10 re-read all of them at (unintelligible)
11 acceptable as good, but what about the workers
12 in the early '50s that did not have MDA plates
13 (unintelligible) and they were exposed to more
14 than the 600 millirem top? Are you going to
15 use -- in the NDRP if you go back and
16 reconstruct their -- their neutron dose --
17 excuse me -- photon ratio even if they weren't
18 -- didn't have mda gamma plates to read?

19 **MR. FALK:** The answer is yes.

20 **MR. BUCHANAN:** The answer to that is yes?

21 **MR. FALK:** Yes, because we would then do the
22 no-show dose multiplying their gamma dose by
23 the neutron to gamma ratio for that building.
24 Now -- Now, the people at Rocky Flats who were
25 not monitored for -- for the neutrons were the

1 people in building 81 which was -- which was
2 the enriched uranium and also building 44 which
3 was the depleted uranium operations. But there
4 is no real evidence that there was a
5 significant neutron component to their external
6 exposures.

7 **MR. BUCHANAN:** So they would not have a neutron
8 dose assigned to them in those buildings?

9 **MR. FALK:** Yes, that is right.

10 **MR. BUCHANAN:** Okay. Okay. At this point I
11 think that I understand how it was done. I
12 would not want to completely sign off if this
13 is not an issue, but I would need to -- to
14 digest a little further. But I guess at the
15 question -- at this time I don't have any
16 further questions.

17 **DR. MAKHIJANI:** Could I ask, Roger -- Mark,
18 sorry. Go ahead.

19 **MR. GRIFFON:** I was going to say I'm going to
20 put that item number 12, Ron, add question
21 number 1 into that and make it sort of one item
22 on our list, and I'll -- I'll say there's no
23 further response because SC&A is still
24 reviewing.

25 **DR. MAKHIJANI:** Yeah. Well, Mark, I think I

1 need a little clarification because I'm looking
2 at this Section 11 in the NDRP and I see where
3 Roger says how they're going to fill these gaps
4 in the dose, but I still don't understand what
5 was the origin of the statement that the most
6 exposed workers were not monitored and how
7 filling these gaps actually addresses that
8 question at all. If the most exposed workers
9 were not monitored are we --

10 **MR. FALK:** They were not monitored for the
11 neutrons. They were monitored --

12 **DR. MAKHIJANI:** For -- For the neutrons.
13 That's what I'm saying.

14 **MR. FALK:** All right.

15 **DR. MAKHIJANI:** If the most exposed workers
16 were not monitored for the neutrons, you got
17 this lead apron problem where the workers were
18 wearing the gamma badge under their lead apron,
19 so you're shielding out the low energy gamma
20 which is a dominant one from the plutonium.

21 **MR. FALK:** I'm not convinced we have evidence
22 that they -- that they wore the lead aprons in
23 the '50s however.

24 **DR. MAKHIJANI:** Well, yeah. I'm just trying to
25 put whatever's on the table so that the issues

1 are at least clear as to the methodology. It
2 didn't seem to me that that issue was brought
3 up one way or another here, and if -- I'm just
4 trying to understand. It was surprising to me
5 to see that statement from you in the petition
6 and I don't know what -- what was the sort of -
7 -

8 **MR. FALK:** The -- The --

9 **DR. MAKHIJANI:** -- empirical substance behind
10 that statement for you to say that the most
11 exposed workers were not monitored.

12 **MR. FALK:** The basis is that the people, the
13 workers who were monitored with the glass
14 plates were the building 91 workers, not the
15 building 71 workers. And -- And basically
16 retrospectively, the people -- the workers most
17 likely to have been exposed to the neutrons
18 were the chemical process operators, and they
19 were in building 71 and that was the basis for
20 my statement in 1994 when I was scoping out the
21 issue.

22 **DR. MAKHIJANI:** Okay. So what do we do then
23 about the building 71 workers who were the most
24 exposed but for whom we don't have data?

25 **MR. FALK:** We have gamma data. We multiply

1 that by the neutron to gamma ratio and then you
2 have a neutron dose which is -- which is our
3 best estimate of their neutron exposure.

4 **DR. MAKHIJANI:** So then my point here would be
5 that it would be crucial to clear up that they
6 didn't have these aprons because your whole
7 dose reconstruction method then depends on --
8 on that one fact because otherwise you -- you
9 don't have -- you don't have -- The
10 differential between gamma absorption in the
11 apron and the neutron absorption in the apron
12 is so big that -- that you don't have a method
13 basically.

14 **MR. FALK:** Well, now, what we do know and the
15 as-found condition when I came to Rocky Flats
16 in 1966 was that the -- the -- was that the
17 hands-on workers at the glovebox did not wear
18 the lead aprons at that time, and it is a
19 reasonable -- it is a reasonable extrapolation
20 backwards that if they didn't wear it in the
21 mid-'60s when they had really high -- when they
22 had really high gamma exposures except -- and
23 especially the soft gamma, that it would not be
24 reasonable to actually expect them to have worn
25 lead aprons back in the '50s.

1 **MR. LANGSTED:** And we validated that with an
2 interview with Ed Putziere (unintelligible) who
3 was the radiation protection manager in 771
4 building in those early years and no, lead
5 aprons were not used essentially at all in --
6 in 71 in those early years.

7 **DR. MAKHIJANI:** Yeah. My -- My only -- I
8 wasn't saying that they were or weren't used.
9 I was just saying that that particular issue
10 becomes crucial to your dose reconstruction
11 method because it's the only thing that you've
12 got for that building.

13 **MS. MUNN:** And it appears they've tied that
14 down.

15 **DR. NETON:** Yes. Thank you.

16 **DR. ULSH:** Okay. We took a brief detour here
17 to comment number 1 from the 24th of March set.
18 I think we were on number 12.

19 **MR. GRIFFON:** Yeah. I think we're -- Well, if
20 we're closed out on that I think we're on 13.

21 **DR. ULSH:** On 13. Okay. Let me see if I can
22 get my head back on track here. Oh, yeah.
23 This was another question. Roger, don't go far
24 from the microphone -- about -- under the
25 heading, Neutron Badge Reading Was Defective.

1 And the comment deals with a page from the
2 petition that says -- that shows that zero
3 entries and neutron dose readings dropped from
4 95.6 percent in 1961 to 56 percent in 1962 and
5 the comment goes on to say that this raises the
6 issue of quality of the badge readings in the
7 earlier period. And this has been acknowledged
8 by NIOSH and the NDRP study was put in place to
9 address this issue. We agree that was the
10 genesis. One of the reasons behind the NDRP
11 issue and the NDRP did address those earlier
12 reads, so I -- I think we're okay here and
13 NIOSH or Arjun is nodding his head, so I think
14 we're okay.

15 **DR. MAKHIJANI:** I got -- Ron -- Ron is the one
16 that would know but I think -- I think that --
17 that seems --

18 **MR. GRIFFON:** Ron, did you have a comment on
19 this?

20 **MR. BUCHANAN:** Well, I'd like to think that --
21 Well, I read the NDRP several times. We have
22 not had formal review of that by SC&A. It's a
23 pretty complex, lengthy document and I've
24 looked over it but I have not made a -- a
25 definite statement on, you know, had a review

1 of that. Now, some of the questions in number
2 2 and 3 of that list of questions, you know,
3 relate to it. We have done a complete
4 examination of NDRP by SC&A.

5 **DR. ULSH:** Okay.

6 **MR. GRIFFON:** I think that and the previous one
7 are still open items, but there's no further
8 action by NIOSH on the part of this
9 (unintelligible)

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

11 **DR. ULSH:** Okay. Comment number 14 is under
12 the heading of Post-1991 worker monitoring was
13 not according to criteria for security guards.
14 And the situation described in the petition
15 here is that during that time period, post-
16 1991, the only workers who were badged were
17 those who were thought to have the potential
18 for a hundred millirem exposure per quarter or
19 more, and the DNFSB found that security guards
20 had potential for greater than that and they
21 were unmonitored. If that situation were to
22 occur, it -- I think NIOSH would approach it as
23 unmonitored radiation workers and we would
24 handle it using the co-worker model, do a co-
25 worker dose reconstruction. So again I think

1 that we perhaps don't have an SEC issue here.

2 **MR. GRIFFON:** I -- I wasn't clear on your
3 response. Are you saying that if that
4 situation occurred, I mean this is specifically
5 for security guards for this specific time
6 period. Have you looked at the, you know, the
7 report and is it -- are you in agreement with
8 that report? And if it did occur, if you're in
9 agreement with the report.

10 **DR. ULSH:** Yes. For such a situation, and it's
11 described in the -- in the DNFSB report. The
12 way that we would handle that would be to treat
13 them as unmonitored radiation workers and do a
14 co-worker data dose reconstruction. So Mark,
15 would that fall into the category of our action
16 has been completed?

17 **MR. GRIFFON:** I think so, and you -- we don't
18 have a co-worker model to look at, do we?

19 **DR. ULSH:** No. Right. We talked about that
20 earlier when we were on the matrix.

21 **MR. GRIFFON:** So in other words a co-worker
22 approach would be used to be determined later,
23 right?

24 **DR. ULSH:** Right.

25 **MR. PRESLEY:** (Unintelligible)

1 **MR. ROBINSON:** This is -- This is Al Robinson
2 again. You know, one thing, you know, on the -
3 - on the dose reconstruction to date -- now, we
4 can apply the co-worker data --

5 **UNIDENTIFIED:** Could you turn that down just a
6 little bit? We're having some complaints.

7 **MR. ROBINSON:** -- gamma exposure, but I would
8 have applied 100 millirem per year as stated
9 here to a security guard, you know, unless
10 there was some evidence that gives any
11 dosimeter -- dosimetry reports said, you know,
12 he had a lot higher dose or had been involved
13 in a -- in an incident or something. But if he
14 was just a routine worker who was not monitored
15 in that post-1991 period, then we would have
16 felt that it fell under the admonitions there
17 and given him 100 millirem.

18 **MS. MUNN:** I can't hear him.

19 **DR. NETON:** A little bit louder then.

20 **MR. GRIFFON:** That's interesting because that's
21 exactly what I was thinking about, will the co-
22 worker model necessarily end up assigning 100
23 millirem?

24 **DR. ULSH:** No.

25 **MR. GRIFFON:** Or greater. It wouldn't

1 necessarily.

2 **DR. ULSH:** The co-worker model would not rely
3 on the 100 millirem criteria at all.

4 **MR. GRIFFON:** Right.

5 **MR. ROBINSON:** Right.

6 **MR. PRESLEY:** Question. If you did the co-
7 worker model would you pick a co-worker model
8 from the area where the guard claimed to have
9 been and not another guard?

10 **DR. ULSH:** When we do co-worker dose
11 reconstructions, we don't apply the co-worker
12 information from a specific individual.
13 Rather, we build our co-worker model on
14 distributions of all the monitored workers. So
15 we would select a claimant favorable percentile
16 value for those years, and it would cover the
17 entire population of monitored workers.

18 **DR. NETON:** I think this is --

19 **MR. GRIFFON:** We have to wait to see the co-
20 worker models.

21 **DR. NETON:** Yeah. I think we need to develop
22 the co-worker model. The security guards to me
23 seem to be an issue -- a situation where we
24 might need to take a little special
25 precautions. It occurs to me that, you know,

1 if we applied the 95th percentile of
2 distribution, we may overestimate these workers
3 and in fact --

4 **MS. MUNN:** Significantly.

5 **DR. NETON:** -- maybe that even the 50th
6 percentile.

7 **MS. MUNN:** Significantly.

8 **DR. NETON:** So it appears that the true
9 exposure may be somewhere between this --

10 **MR. GRIFFON:** Right.

11 **DR. NETON:** -- 100 millirem and the 50th
12 percentile. We -- We would need to take a
13 slightly closer look at that to figure out
14 where it would --

15 **MR. GRIFFON:** That's why I was -- I was asking
16 first if you're in agreement with the DNFSB
17 report (inaudible)

18 **DR. ULSH:** I don't -- I don't have any reason
19 to fault or to doubt the DNFSB report at this
20 time.

21 **MR. ROBINSON:** Because the other, you know, the
22 other issue is like any other -- like any other
23 dose reconstruction. You know, if there was a
24 year or a couple of years, then we would look
25 at the dose on either side, so often you could

1 tell whether or not there was (unintelligible)
2 gotten a higher dose.

3 **DR. NETON:** One thing I'm not clear on is this
4 -- this comment says that 100 millirem exposure
5 per quarter. My recollection of
6 (unintelligible) 4835 is that it was 100
7 millirem per year. I'm not sure why Rocky
8 Flats would adopt something that would be
9 inconsistent with the regulations. We need to
10 take a look at that as well.

11 **MR. GRIFFON:** Could it have been --

12 **DR. NETON:** It could just be a typo.

13 **MR. GRIFFON:** -- probably.

14 **MR. LANGSTED:** You're correct, Jim. The
15 criterion would be 100 millirem per year --

16 **UNIDENTIFIED:** A year.

17 **MR. LANGSTED:** -- for badging.

18 **MR. GRIFFON:** For (unintelligible)

19 **DR. NETON:** Actually, the -- I think the 835
20 interpretation is the internal/external
21 exposure were independent source terms. At
22 least that's the way most sites interpreted it.

23 **MR. GRIFFON:** Oh, yeah. We've been around --
24 I've been around the block now. Yeah, I think
25 you're right though. Yeah.

1 **DR. NETON:** In fact -- Well, yeah.

2 **MR. GRIFFON:** But anyway, that -- Yeah, so I
3 think your -- we ought to respond at this
4 point, I think.

5 **DR. NETON:** I think we do, too.

6 **MR. GRIFFON:** How it's going to be handled in
7 terms of co-worker model.

8 **DR. NETON:** Well, I think Brad is actually
9 right that this is really an interpretation
10 issue and not a -- a bounding dose calculation
11 issue for SEC implications. This is -- This
12 is rather where one fixes the set point for
13 reconstructing what -- what would be
14 unmonitored dose in this case.

15 **MR. GRIFFON:** I would agree.

16 **DR. ULSH:** Okay. The next comment is comment
17 number 15, and this is -- this is an involved
18 comment. It's going to take a little time. I
19 don't know where we stand in terms of breaks,
20 but we're going to be here for a while if we
21 bump into 15.

22 **MR. GRIFFON:** Well, I'm certain we could get
23 through, but maybe we should take a break at
24 this point.

25 **DR. WADE:** Okay. If we got some heavy --

1 Let's take a very quick five minute stretch
2 break and --

3 **MR. GRIFFON:** Take five.

4 (Whereupon, a recess was taken from 3:40 p.m.
5 to 3:50 p.m.)

6 **DR. WADE:** Okay. We're back in session.

7 **DR. ULSH:** Okay. I think we left off with
8 comment number 15, and this comment is under
9 the heading of many incidents were not reported
10 or recorded. And this comment cites some pages
11 in the petition that actually constitute a
12 consent order between the Department of Energy
13 and Kaiser Hill. I've scanned and put this
14 into this handout. It starts on page 19 and
15 I'd like to walk you through this consent
16 order. If you look at near the bottom of page
17 19, you'll see a paragraph that begins internal
18 intakes of radioactive material occurred with
19 two workers who were doing some underground
20 tank remediation activities. This is the first
21 example that's dealt with in the -- in the
22 consent order, and this occurred in 1996. What
23 happened here was that due to a number of
24 issues dealing with regulatory compliance
25 primarily, the consent order describes some

1 failings on Kaiser Hill's part to maintain
2 ALARA. And what happened was that these
3 workers got some intakes; however, this was not
4 discovered at the time of the incident.
5 Rather, it was discovered through routine
6 bioassay for one worker and by a special
7 request bioassay for the second worker. That's
8 described on Page 20. Again, I don't -- I
9 don't think that this actually demonstrates
10 issues that were unreported. In fact, this is
11 exactly the opposite. This issue was
12 discovered and -- and investigated and included
13 in a consent order. Rather, it shows that
14 intakes are not always recognized at the time
15 that they occur and that's why you have a
16 routine bioassay program. So I think that
17 that's really all I want to say about that
18 particular example. The next incident --
19 **MR. GRIFFON:** Again, were -- were all workers
20 under the routine bioassay program?
21 **DR. ULSH:** Were all workers under the routine
22 bioassay program in 1996?
23 **MR. GRIFFON:** (unintelligible)
24 **DR. ULSH:** I'm looking at my -- at my subject
25 matter experts for the answer to that question.

1 **MS. MUNN:** Bioassay programs?

2 **DR. NETON:** This is Jim Neton. I think that in
3 -- by 1996 the requirement was to have all
4 workers with the potential to receive 100
5 millirem --

6 **MR. GRIFFON:** Right.

7 **DR. NETON:** -- on some type of bioassay
8 program. So it probably wasn't all workers,
9 but --

10 **DR. ULSH:** But these workers were.

11 **MS. MUNN:** Yeah.

12 **DR. NETON:** Right.

13 **MS. MUNN:** (unintelligible) pretty serious.

14 **MR. GRIFFON:** You've been answering several of
15 these questions with the fact that well, that's
16 why you have bioassay programs but you get --
17 The question is really more complicated if the
18 individuals involved in the incident were not
19 on the bioassay program or never were on the
20 bioassay program.

21 **DR. ULSH:** But there's no evidence of that
22 presented here, Mark. This -- This consent
23 order deals with an incident where workers who
24 were on routine bioassay programs had an
25 intake. So I don't think that this consent

1 order can be used as evidence that the opposite
2 --

3 **MR. GRIFFON:** Well, there was one person at
4 least that indicated -- I haven't read it yet,
5 but the one person indicated he had requested a
6 bioassay but he was not on a routine program.

7 **MS. MUNN:** Well, the consent order says uptakes
8 were discovered through routine bioassay.

9 **DR. ULSH:** For one worker.

10 **MS. MUNN:** For one.

11 **DR. ULSH:** And then by special request for
12 bioassay --

13 **MS. MUNN:** Requested by the other.

14 **DR. ULSH:** -- by the second worker.

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

16 **MR. GRIFFON:** Right. So you self-identified,
17 and if that's fine for this situation. I guess
18 that's just what I'm asking, both what the
19 percentages were for -- because I think you
20 have people -- I think it's just a question of
21 how do you handle the unmonitored and what
22 fraction of people fall into that category, I
23 guess is what I'm getting at.

24 **MS. MUNN:** Does --

25 **MR. GRIFFON:** Now, I understand the unmonitored

1 people --

2 **DR. NETON:** Yeah. I mean we took --

3 **MS. MUNN:** (unintelligible) requested

4 (unintelligible)

5 **MR. GRIFFON:** -- were either involved or not

6 involved in it.

7 **DR. NETON:** Typically, Mark, as you might

8 remember, the way we handle co-worker data for

9 internal exposures are that workers who were

10 judged by NIOSH to have -- were not monitored

11 and should have been monitored --

12 **MR. GRIFFON:** Right.

13 **DR. NETON:** -- because they had high potential,

14 would receive the 95th percentile --

15 **MR. GRIFFON:** Right, because --

16 **DR. NETON:** -- the co-worker model.

17 **MR. GRIFFON:** -- it might -- maybe

18 (unintelligible) the model (unintelligible)

19 **DR. NETON:** Right. And then if in this case,

20 you know, it depends on how this worker, what

21 his job function was. But if it was judged

22 that he probably didn't need to be monitored on

23 the program, he would have received the 50th

24 percentile. Then there's a further cut point

25 for someone who really had almost no potential,

1 which would be the secretarial/administrative
2 types.

3 **MR. GRIFFON:** Right.

4 **DR. NETON:** So that's -- that's how it would be
5 handled.

6 **DR. ULSH:** And I -- Mark, I -- I -- The
7 consent order --

8 **MR. GRIFFON:** That's what I assume you said,
9 the co-worker was monitored.

10 **DR. NETON:** Yeah.

11 **DR. ULSH:** Well, the consent order does say
12 that for the second worker it was a special
13 request for bioassay; however, it doesn't say
14 that he wasn't on routine bioassay in addition.
15 It's just that it was discovered by the special
16 request.

17 **MR. GRIFFON:** Okay.

18 **DR. ULSH:** Okay. The next example begins at
19 the bottom of page 20 of the handout, and this
20 -- this details a number of individuals in '96
21 and '97 who were not monitored and later it was
22 discovered that they actually did receive a
23 dose while they were not monitored. And keep
24 in mind, though, that this comment is under the
25 heading of incidents that were not reported or

1 -- I want to get the right word -- not reported
2 or recorded. Okay. So this incident we've got
3 unmonitored individuals receiving dose,
4 however, I would direct you to the middle of
5 the -- the bottom paragraph on page 20 where it
6 talks about SSOC, Safe Sites of Colorado. They
7 initiated an investigation and dose
8 reconstructions began for these individuals in
9 mid-September of 1997. So these -- these
10 incidents are not examples of -- of instances
11 that were not reported. On the contrary, they
12 were investigated. The next example is not
13 terribly informative. I don't think it's being
14 advanced in relation to the SEC petition.
15 That's at the top of page 21. Deals with a
16 sealed source custodian conducting an inventory
17 and he didn't receive the training that he
18 should have received. I don't think that
19 that's really an issue that we need to go into,
20 although I will if anyone wants to. Okay.
21 Finally, we get to the conclusions, section 3.
22 It's labeled section 3 on page 21 and I'd like
23 to just read that to you. It says that DOE has
24 evaluated the results of the investigations
25 conducted by Kaiser Hill and has concluded that

1 the findings and conclusions with respect to
2 these incidents are comprehensive. DOE has
3 concluded that these investigations fully and
4 accurately disclose all relevant facts
5 including the identification of potential
6 violations of nuclear safety requirements. It
7 goes on and talks about in the areas of
8 radiation protection and quality assurance and
9 objectively assesses the actual potential or
10 programmatic safety significance of these
11 potential violations. This consent order does
12 not show events that were unrecorded and
13 uninvestigated. It shows exactly the opposite,
14 and the conclusions stated here, I -- I think
15 put their interpretation on there. Comment --
16 section 4 says that DOE acknowledges Kaiser
17 Hill's -- Kaiser Hill's aggressive and
18 comprehensive investigation to determine the
19 causes of these incidents and open an objective
20 assessment of the operational shortcomings
21 involved. DOE has also evaluated and agrees
22 with the adequacy of the corrective actions. I
23 don't see this as evidence for many incidents
24 going unreported and uninvestigated.

25 **MR. GRIFFON:** Okay. I mean that was a thorough

1 analysis of -- of -- I'm not sure where the --
2 that list is from. Is that table E-5 or --

3 **DR. ULSH:** This --

4 **MR. GRIFFON:** -- I have all the references of
5 all the --

6 **DR. ULSH:** Let me go back to the comment.

7 **MR. GRIFFON:** -- but they were all in the '90s,
8 right, meaning --

9 **DR. ULSH:** Well, yeah. I was addressing --

10 **MR. GRIFFON:** -- I'm going -- I'm going to the
11 first section of the comments, number 15 says
12 the petition claims (reading) "throughout the
13 history of the site it was common practice for
14 incidents in the workplace be handled at the
15 floor or building level and not reported." I
16 don't know if you have a response to that part
17 of it.

18 **DR. ULSH:** I think that that is true, Mark,
19 that there were incidents that were at the
20 discretion of the floor super-- of the -- of
21 the management that were to be decided what was
22 a sufficient magnitude incident to report. I
23 think that that's probably true.

24 **MR. GRIFFON:** The real response there is that
25 we'll still capture the dose on the routine or

1 co-worker model, right?

2 **DR. ULSH:** Exactly.

3 **MR. GRIFFON:** Routine bioassay or co-worker
4 model.

5 **DR. ULSH:** Exactly.

6 **MR. GRIFFON:** And Jim's explanation -- I mean
7 we haven't seen a co-worker file yet but if it
8 holds true that we -- if they were supposed to
9 be -- should have been monitored or -- so we
10 have a 95th percentile approach.

11 **DR. ULSH:** Right.

12 **MR. GRIFFON:** Okay.

13 **DR. ULSH:** Okay. Unless anyone has any
14 questions or wants some follow-up, we're up to
15 almost the end here. All right. Comment
16 number 16 on this data set, and that's on page
17 24. I had a little trouble following this
18 comment and -- and I might have misinterpreted
19 it. It appears to be concerned with the
20 estimation of doses from material that was
21 inhaled and then cleared out of the lungs and
22 swallowed, ingested. That's the way I
23 interpreted the comment, and I -- and it asks
24 how we would handle this issue. And my
25 response is the ICRP models take this

1 phenomenon into -- explicitly into account.
2 They do -- ICRP 66 does consider material
3 that's cleared from the lungs into the GI tract
4 and so the models that we use handle the
5 situation. Maybe I misinterpreted the comment;
6 I don't know.

7 **MR. GRIFFON:** You know, it seems to be asking
8 about both. Can someone read the comment? I
9 don't have the full comment or the full --

10 **DR. ULSH:** Yeah, because it -- Well, it says
11 that workers ate in workplaces and that's --

12 **MR. GRIFFON:** I think it boils down to Arjun's
13 review, right?

14 **DR. ULSH:** Pardon?

15 **MR. GRIFFON:** Arjun, can you speak to that
16 comment?

17 **DR. MAKHIJANI:** I was looking at a previous one
18 still. Sorry. I missed it.

19 **DR. ULSH:** Comment number 16, Arjun.

20 **DR. NETON:** The one about ingestion, 16.

21 **DR. ULSH:** We were -- We -- It seems to be
22 that this comment's concerned with how you deal
23 with material that was inhaled and then cleared
24 out of the lungs and swallowed, ingested. Is
25 that -- Is that correct?

1 **DR. MAKHIJANI:** Yeah, I -- I think --

2 **MR. GRIFFON:** Eating in the workplace
3 (unintelligible)

4 **DR. MAKHIJANI:** Yeah, the -- the -- the problem
5 would be, you know, if there are ingestion
6 doses that are significant and -- and in light
7 of the low systemic doses from the inhaled
8 component, could it be that it might be higher
9 doses or if -- if bioassay data were
10 reinterpreted as ingestion doses, whether they
11 might give you a different result or -- or how
12 you calculate that component.

13 **DR. NETON:** Yeah. It -- It appears to me
14 looking at the paraphrase of the issue raised,
15 that there are two questions here. One is --

16 **DR. MAKHIJANI:** Right.

17 **DR. NETON:** I agree with Mark on that. One is
18 that there was ingestion via inhalation and
19 Brant's answer is right on target here in
20 relation to that, that any ingestion as a
21 result of an inhalation dose is explicitly
22 dealt with in the ICRP models. I think we all
23 agree with that. Now when they -- when they
24 assert here that workers ate in the workplaces
25 and how the bioassay data would be interpreted.

1 In light of this problem an ingestion may have
2 occurred via re-suspension, that -- that --
3 well, re-suspension would be --

4 **MR. GRIFFON:** All it did was provide that re-
5 suspension would be still be inhalation.

6 **DR. NETON:** Yeah, re-suspension would be re-
7 inhalation so --

8 **MR. GRIFFON:** Yeah.

9 **DR. NETON:** -- really then we're back to
10 workers ate in the workplaces and potential
11 ingestion pathway, and I don't recall what --
12 how in -- how specifically the ingestion
13 pathway was dealt with in the Rocky Flats site
14 profile. And my recollection is that there
15 were some comments by SC&A on that issue.

16 **UNIDENTIFIED:** Something I recall.

17 **DR. NETON:** And -- And I'm at a loss as to
18 how to -- how to -- how to bracket that. I
19 think -- I think the -- you know, plutonium
20 itself has a very low gastrointestinal
21 absorption factor. I think that's well-
22 recognized. But we need to -- I think we need
23 to reevaluate this comment in light of the fact
24 that, you know, they are -- I think they are
25 sort of asking about how we're dealing with

1 ingestion doses and from eating in the
2 workplace and we -- we need to -- we need to
3 re-look at that I think, and -- and address it.

4 **DR. MAKHIJANI:** Yeah. Just for clarification,
5 Jim, I did not go back to our -- to the site
6 profile or the site profile review. As you can
7 see, sometimes these were quick paraphrases and
8 --

9 **DR. NETON:** I understand.

10 **DR. MAKHIJANI:** -- thank you for making --
11 making them more accurate as you went.

12 **DR. ULSH:** Well, I completely understand,
13 Arjun. Some of my responses were pretty quick,
14 too, so -- in fact, all of them were. Okay.
15 Number 17. This is length of the work week.
16 Worker alleges that the work week was logged as
17 40 hours when it was 45 hours. This might fall
18 into the category of an issue that may not have
19 SEC implications, especially at Rocky Flats
20 because this -- this consideration --

21 **MR. GRIFFON:** (unintelligible)

22 **DR. ULSH:** Right, exactly. This would be
23 important if we were doing a source term
24 calculation perhaps. We don't propose to do
25 that at Rocky Flats. We were going to rely on

1 individual dosimetry results, so I don't --
2 Okay. That's okay, Arjun?

3 **DR. MAKHIJANI:** Yeah.

4 **MR. FITZGERALD:** Just a -- That's closed. I
5 want to go back to 15, and we did have a issue.
6 Item 15 on the original matrix.

7 **DR. ULSH:** Oh.

8 **MR. FITZGERALD:** And I'll just read the NIOSH
9 response, which I think is where that was left
10 in terms of ingestion. Discussion of the
11 ingestion pathway will be -- will be added to
12 the TBD. So I guess that infers that it wasn't
13 there.

14 **DR. ULSH:** Right.

15 **MR. FITZGERALD:** And the ingestion pathway,
16 except as a clearance process for inhalation
17 intakes is not significant for workers in
18 plutonium-enriched uranium process areas
19 because eating and drinking in the process
20 areas were strictly forbidden. It is not clear
21 how strictly the rules were enforced for
22 depleted uranium areas. This issue will be
23 reviewed. That's what we had --

24 **DR. ULSH:** Okay.

25 **MR. FITZGERALD:** When we left it in the site

1 profile.

2 **DR. NETON:** I thought that was my recollection.

3 **DR. ULSH:** Okay. That was the big data, the
4 big comment set.

5 **MR. GRIFFON:** Now we go on to March 24th, is
6 that --

7 **DR. ULSH:** Yes.

8 **UNIDENTIFIED:** Yeah.

9 **MARCH 24TH COMMENTS**

10 **DR. ULSH:** Now we're on to March 24th. I think
11 we've talked about comment number 1.

12 **MR. GRIFFON:** Right, under previous discussion.

13 **DR. ULSH:** Right. So now we get into comment
14 number 2. This, Mark, to track this back, I
15 think it's -- the first incarnation was we were
16 going to provide plutonium tetrafluoride
17 calibration data, and we referred SC&A to Mann
18 and Boss. They have reviewed Mann and Boss and
19 then these questions result from that review.

20 **MR. GRIFFON:** Does it go back to number 6?

21 **DR. ULSH::** Oh --

22 **MR. GRIFFON:** Or should number 6 be original
23 (unintelligible) --number 6 -- because I have
24 to put this together later.

25 **DR. ULSH:** Yeah, let me look, Mark.

1 **MR. GRIFFON:** I think it's 7. Maybe it's 7.

2 **DR. ULSH:** It's matrix issue number 7, action
3 item number 1 from the February 27th matrix.

4 **MR. GRIFFON:** Right.

5 **DR. ULSH:** So that's kind of the pedigree of
6 this issue. Okay. When we referred SC&A to
7 the Mann and Boss article, we were doing that
8 to provide details of the calibration sources
9 that we used in the NDRP. It's -- What we've
10 concluded based on the time estimates that were
11 given in Mann and Boss for reviewing these --
12 the NTA films is that they focused on the large
13 obvious tracts. In contrast, the NDRP focused
14 not only on the large obvious tracts, but
15 tracts as small as three to five grains. And
16 so they were much more sensitive -- the NDRP
17 results were much more sensitive to the low
18 energy neutrons, and what the NDRP did to deal
19 with this calibration issue was they exposed
20 four films -- and Roger has corrected me in my
21 response on page 3. I said they were four
22 replicate films. In fact they were not
23 replicate films. They were four films over a
24 range of doses. They were exposed to the bare
25 source, which is shown in Mann and Boss. They

1 were also exposed to the most moderated neutron
2 source, and they were read blindly. And what
3 they found was that there was an insignificant
4 difference between the two. The moderation
5 didn't affect the sensitivity of the films.
6 The difference was only about two percent,
7 therefore, they concluded that there was no
8 significant difference and they used the
9 overall calibration factor. Now, Roger,
10 correct me if I said anything wrong there.

11 **MR. FALK:** That is -- That is correct.

12 **DR. ULSH:** That's -- Okay. And that's
13 described in section 8 of the NDRP, page 15.

14 **MR. BUCHANAN:** No, this is wrong. Okay. I
15 have a question on that. Now, I understood the
16 last time we talked, Roger said they did not
17 re-expose any -- any film there in the NDRP
18 process. Is that correct or incorrect?

19 **MR. FALK:** I did not expose any films for the
20 NDRP project. These were the calibration films
21 that I had exposed in 1967 and '68 during the -
22 - during the lifetime when I was basically
23 overseeing the neutron film reading at that
24 point. So these are basically archived films
25 that I had essentially archived from those

1 early times, and then I constructed the -- the
2 calibration sets for the film readers for the
3 NDRP projects from those old calibration films.
4 And I -- And then I put in each set, four
5 films of the bare moderation and four films of
6 what we called the demoderation, which was that
7 -- was that -- the -- the -- which was the
8 thickest moderation of the -- of the Mann and
9 Boss set. So we had the unmoderated and then
10 we had the heavily moderated, and what we did
11 is that is that all of the film readers for the
12 neutron dose reconstruction project blindly
13 read those films to establish what the millirem
14 per track would be for their readings. And
15 then at the end of the project, I basically
16 took all their data and then did a comparison
17 of their calibration factors for the -- for the
18 unmoderated plutonium fluoride source and I
19 compared that to their own calibration factors
20 for the moderated source and did an overall
21 composite and found only a -- found only a two
22 percent difference. Therefore, I said there
23 was no significant difference. We can use the
24 calibration set based on the composite for the
25 final analysis of the neutron doses for the

1 NDRP project.

2 **MR. BUCHANAN:** So you're saying that when you
3 reread the older calibration film, that you
4 found out that the millirem per tract or per
5 square millimeter was the same in heavily
6 moderated as it was with the bare neutron
7 source. Is that what you're saying?

8 **MR. FALK:** Yes.

9 **MR. BUCHANAN:** And you're saying that Mann and
10 Boss in the past had not read the shorter
11 tracks and so they'd seen the difference and
12 that explains why they'd seen the difference
13 and you didn't?

14 **MR. FALK:** I am basically speculating that to
15 be the case and I'm not even sure that Mann and
16 Boss actually read those. I am thinking it's
17 more likely that the film readers -- that the
18 film readers of that era read the films and
19 they would more -- most likely read -- most
20 likely read only the obvious tracks and not the
21 -- and not the shorter less obvious tracks.
22 That -- That is my working hypothesis as to
23 why there is that difference.

24 **MR. BUCHANAN:** This one is very different in
25 the length of the track from the moderated to

1 the unmoderated. Maybe you counted the same
2 number of tracks per -- per millirem. Were
3 there difference in the length like for say,
4 the unmoderated, were the lengths of the tracks
5 longer generally on an average then say the
6 moderated source?

7 **MR. FALK:** I am visualizing that, and also I
8 had pondered that. But I would say that --
9 that a film reader would not be able to tell
10 just by looking at the films which one was
11 moderated and which one was not. It is not
12 obvious to me.

13 **MR. BUCHANAN:** Okay. Yeah, I see what you're
14 saying. It kind of goes against the grain of -
15 - of most neutron dosimetry and so that has to
16 consider whether, you know, what would be -- be
17 scientifically tolerant as compared to other
18 information that's out there. I think I follow
19 what you're saying you did now. I wasn't sure
20 from the NDRP. Like I say, I haven't
21 scrutinized it page for page, but I understand
22 what you're saying at this point. The second
23 question then, in -- in evaluating the neutron
24 fields at Rocky Flats, so at this point say we
25 accept the fact that the neutron reader, the

1 film readers read the tracts equally well from
2 -- the calibration factor is the same whether
3 you use the moderated or the unmoderated
4 source, which I think it was stated as 1.4 MeV
5 for the unmoderated and .15 MeV average
6 apparent energy for the moderated. Those did
7 cover all the reasonable neutron spectrums at
8 Rocky Flats through the years, so it's going to
9 be applying it to all situations through all
10 times at Rocky Flats and so apparently you feel
11 that this covers all the situations that would
12 reasonably exist.

13 **MR. FALK:** It covers all the film situations in
14 the '50s and '60s. I have not -- I have not --
15 -- I have not extrapolated that into the later
16 years because we're using the -- we're using a
17 different system. We're using the -- the --
18 the TLD system after that.

19 **MR. BUCHANAN:** Yes, okay. Right. I should be
20 -- I should have stated up through the MDA.

21 **MR. FALK:** Yes.

22 **MR. BUCHANAN:** Does anybody else have any
23 comments on that question?

24 **DR. MAKHIJANI:** Yeah, this Arjun. If I -- If
25 I recall, the average moderated energy is .15

1 MeV. Is that right, Roger?

2 **MR. FALK:** That is the measurement that Mann
3 and Boss --

4 **MR. BUCHANAN:** Yeah, right.

5 **MR. FALK:** -- had reported.

6 **DR. MAKHIJANI:** So I'm -- I'm just wondering.
7 I know you feel the uncertainties are low, but
8 what we've got is really a measurement that's
9 heavily weighted in the high energy spectrum,
10 or extrapolating because we know the spectrum
11 of the moderated neutrons; is -- is that right?

12 **MR. FALK:** We don't know the spectrum of the
13 moderated neutrons. We know the spectrum of
14 the unmoderated -- we know the spectrum of the
15 unmoderated neutrons for -- for a plutonium
16 fluoride source based on spectrum in the
17 published literature that I don't know the
18 reference to at this point.

19 **DR. MAKHIJANI:** Yeah. And -- And how -- how
20 are we then calculating the spectrum of the
21 unmoderated neutron --

22 **MR. FALK:** We aren't calculating --

23 **DR. MAKHIJANI:** -- of the moderated neutrons?

24 **MR. FALK:** We aren't calculating the spectrum.
25 The way that I described it in the Boston

1 meeting is what we did, or -- or what I did is
2 we had the source term for the plutonium
3 fluoride source as given to us by calibration
4 at -- at the Los Alamos graphite pile. We can
5 then calculate the -- the -- the neutron dose
6 rate at a certain distance based on the
7 spectrum and based on the -- and based on the
8 source term which was called -- which was
9 called the Q value for the unmoderated. Then
10 we took the Henkins ten-inch sphere neutron
11 dose rate meter and calibrated that to the
12 unmoderated source. Then we put the moderator
13 around the source and measured the dose rate
14 from that moderated source, so -- so the -- and
15 so the Henkins ten-inch sphere became a
16 secondary transfer standard and that's how we
17 determined the -- the dose rate at that same
18 distance for the moderated source.

19 **DR. MAKHIJANI:** So in effect you have -- you
20 have a spectrum for the moderated source?

21 **MR. FALK:** We have a spectrum, but we do not
22 have it quantified.

23 **MR. BUCHANAN:** You have an effective average
24 energy, not a detailed spectrum; is that what
25 you're saying?

1 **MR. FALK:** We don't go through that step. We
2 go straight from the dose rate measured by the
3 ten-inch sphere meter calibrated to the dose
4 rate calculated for the bare source at the same
5 distance. So we have a transfer standard in
6 that -- in that instrument.

7 **DR. MAKHIJANI:** Okay. I'll -- I'll have to
8 absorb this like sort of a dose almost.

9 **MR. FALK:** Right.

10 **DR. MAKHIJANI:** But what -- what's the
11 uncertainty between, you know, that's created
12 by -- by doing it this way rather than knowing
13 the spectrum of the moderated neutrons? I mean
14 that's I guess what I'm getting at.

15 **MR. FALK:** It is hard to know that spectrum.
16 The basic technique at that time was a multi-
17 sphere type of a system which was still very --
18 which was still very primitive just to -- just
19 to go through that secondary step, and why do
20 that when you can go straight to a dose rate
21 measured by the instrument which is -- which is
22 touted as a rem meter and was a standard for
23 all field surveys at that time.

24 **MS. MUNN:** (unintelligible)

25 **DR. ULSH:** Is -- Is there anything else on

1 comment number 2?

2 **MR. BUCHANAN:** No, and the -- we already
3 discussed the -- the NTA calibration -- site
4 calibration earlier so we don't have to address
5 that last sentence then.

6 **DR. ULSH:** Okay. Folks, we've almost made it.
7 We're on the last comment, comment number 3.

8 **MS. MUNN:** (unintelligible)

9 **DR. ULSH:** That's 19 -- The comment concerns
10 1970 neutron data, and that was a strange year,
11 1970 was. What you have to consider is that
12 there are essentially three time periods when
13 we consider neutron doses at Rocky Flats. The
14 earliest is 1952 through 1969, which was
15 covered by the NDRP. Now, the NDRP did
16 actually look at a few field films that were
17 available in 1970. I'm going to rely on Roger
18 to fill in the holes in my -- my account here.
19 As I understand it there were films, a limited
20 number of films in 1970 and those were for the
21 workers that were most exposed. Is that
22 correct, Roger? The chem ops in '71
23 (unintelligible)

24 **MR. FALK:** All of the workers in the primaries
25 were monitored with the films. Most of those

1 were not archived to be available to be read by
2 the NDRP project. Only the -- only the films
3 essentially for the process operators and a
4 couple other higher exposed groups were
5 available to be read by the NDRP project.

6 **DR. ULSH:** Okay. So that's the first time
7 period. The middle time period spans 1970 to
8 1976 and during that time period, neutron and
9 gamma doses were combined into one value which
10 was named penetrating dose. And then you have
11 the third time period, and that's from 1977
12 forward, and we have calculated a neutron to
13 gamma ratio from that time period. And what we
14 did was we extrapolated backwards. We
15 extrapolated that neutron to gamma ratio
16 calculated from 1977 forward. We've applied
17 that to the 1970 to '76 time period, and the
18 reason that we did that was because both of
19 those time periods from '70 to '76 and '77 on
20 were in the TLD era, whereas before, in the
21 period that the NDRP covered, we were in the
22 NTA film era. So we thought that it would be
23 more appropriate to use a neutron to gamma
24 ratio calculated with TLD's for that middle
25 time period. Now, what I want to emphasize is

1 that during that time period when we had the --
2 only the penetrating dose, essentially we can -
3 - one approach that we have used in the past is
4 that we've double-dipped. We've applied --
5 Since we can't say how much was neutron, how
6 much was gamma, we apply it to both. And that
7 is, we contend, claimant-favorable.
8 Alternatively, we could apply it all to
9 neutrons or all to photons, whichever is
10 claimant-favorable. And Al Robinson, are you
11 still online?

12 **MR. ROBINSON:** Yes. Yes, I am.

13 **DR. ULSH:** Okay. So you jump in and correct me
14 when I'm going astray here, but that's how we
15 handled the 1970 time period. We applied to
16 neutron to gamma ratio calculated in the later
17 time period, so Arjun or Ron, does that answer
18 your questions on that?

19 **MR. BUCHANAN:** Well, the question I have is
20 that in 1970 -- and I understand that that's
21 what you was planning on doing; however, if
22 that -- in the NDRP in section 11.5 says that
23 the gamma dose could not be consistently or
24 accurately discerned from the data on the gamma
25 TLD worksheet. And so my concern was how did

1 we apply it to a gamma ratio if we don't know
2 the gamma dose in all cases.

3 **MR. FALK:** The answer is that -- that the NDRP
4 project did not attempt to -- to actually
5 assign a notional dose for the workers in the
6 year 1970, not because of the gamma issue but
7 because we couldn't identify the gaps because
8 we could not -- we could establish from the
9 worksheets available a -- we could not
10 establish a coherent timeline for those workers
11 to know when there were gaps and when -- and
12 when there were not gaps. Actually, the issue
13 is somewhat moot because I don't think there
14 were likely many gaps because -- because
15 workers were actually monitored for the
16 neutrons in that time period. Then -- Then --
17 Then, also the issue with the gamma doses from
18 the TLD's is the fact that the doses were not
19 calculated by the technicians on the
20 worksheets. Rather, they were calculated by
21 the mainframe based on the crystal readings.
22 And therefore, we -- therefore, we didn't have
23 the information on -- on the worksheets that
24 would allow us to essentially reconstruct what
25 the IBM mainframe would have called their gamma

1 dose just from the crystal readings. And since
2 we couldn't establish the coherent timeline for
3 them, it was a moot issue anyway because we
4 didn't bother trying to go through that effort
5 to then recalculate the gamma doses if we
6 weren't going to be able to do the notional
7 dose anyway. So basically the scope of the
8 NDRP project did not extend into 1970 except
9 for the films we had available to be reread.

10 **MR. BUCHANAN:** Okay. So it seems you're saying
11 that the gamma dose is available on the
12 mainframe and so that's not what it's referring
13 to there in 11.5, that the workers' records
14 have the gamma dose reported; is that correct
15 for 1970?

16 **MR. FALK:** Yes, that is correct.

17 **MR. BUCHANAN:** Okay. So that -- that clarifies
18 a lot of issues. Okay. And -- And then the
19 other last issue was in the -- in the OTIB 50
20 it states that -- it talks about NDRP neutron
21 dose for 1970, and I -- if I understand you
22 right, you're saying that there are -- you did
23 a few re-reads on the MDA's for the '70s so
24 there's some data there, but it's not as
25 complete as the other years; is that correct?

1 **MR. FALK:** Yes.

2 **MR. BUCHANAN:** Okay. Well, that clarifies a
3 lot of issues on question number 3.

4 **DR. MAKHIJANI:** When did they start wearing the
5 lead aprons?

6 **MR. FALK:** I do not know.

7 **DR. MAKHIJANI:** So this -- Again, whenever
8 you've got neutron to photon ratios I guess you
9 -- you're going to have this question.

10 **MR. FALK:** Yeah.

11 **DR. MAKHIJANI:** Presumably.

12 **MS. MUNN:** But it wasn't the '50s and '60s --

13 **DR. MAKHIJANI:** Yeah. Well --

14 **MS. MUNN:** -- it was the --

15 **DR. MAKHIJANI:** Right.

16 **MR. FALK:** It was transferred to the body
17 counter also in 1970. It wasn't a very well-
18 behaved year.

19 **MR. GRIFFON:** Hey, Ron, did the question we
20 just discussed, the two questions, do they
21 fully address any issues that are -- I just
22 got the report from Joe that he forwarded me,
23 and your report on the OTIB 50. Are there
24 other issues in there that were not in this
25 question?

1 **MR. FITZGERALD:** Ron, just to clarify, you
2 earlier indicated that these three were the
3 ones that perhaps touched on some SEC
4 significant concerns. I don't -- I think
5 there's other perhaps questions, but they're
6 probably just more site profile related.

7 **MR. BUCHANAN:** Yes, that's correct. These --
8 These three were -- were boiled down to be the
9 possible SEC which I needed to address, you
10 know; of course we did make a statement on
11 that. But yeah, I think the rest of these
12 (unintelligible) in OTIB for site profile that
13 were TIB's. I didn't have a lot of question on
14 that. It was so directly linked to NDRP. But
15 I had to ask each questions on NDRP to fully
16 evaluate OTIB. So no, I don't think that
17 they're SEC.

18 **MR. GRIFFON:** Is there anything else on -- on
19 comment 3 or are we closing in on the end here?

20 **MR. BUCHANAN:** I think that the -- that's it
21 for right now.

22 **MR. GRIFFON:** Do you want to go through the
23 other 20 comments?

24 **DR. WADE:** Sadly, we're close to the end. We
25 were having such fun.

1 **MS. MUNN:** Sadly indeed.

2 **MR. GRIFFON:** We're at the end of our packing
3 list here.

4 **MR. FITZGERALD:** You haven't hung up, Mark.

5 **MR. GRIFFON:** I don't think we have any sample
6 DR's at this point for Rocky or anything like
7 that.

8 **DR. ULSH:** No. No, not yet.

9 **MS. MUNN:** We're nearing the end of our energy
10 level as well, Mark.

11 **MR. GRIFFON:** Right, right. It's not only the
12 microphones fading now, it's the people.

13 **MS. MUNN:** True, true.

14 **MR. GRIFFON:** So I think it's time to adjourn
15 unless there's any other issues here.

16 **DR. WADE:** No. Just with great thanks to -- to
17 all participants. And it was a long day, but
18 it was a productive day, and as I said, if
19 other information comes available, please share
20 with all involved, including the board, and
21 then we'll see --

22 **MR. GRIFFON:** Did you put us on hold, Lew?

23 **DR. WADE:** What's that?

24 **MR. GRIFFON:** Did you put us on hold?

25 **DR. WADE:** No.

1 **MS. MUNN:** Somebody else did.

2 **DR. WADE:** Somebody else did but we can --

3 **MR. GRIFFON:** We got music.

4 **DR. WADE:** That's fine. You can use that music
5 to play us off the stage.

6 **MR. GRIFFON:** Well, I -- I will offer also to
7 update the matrix again for our next meeting
8 prior to -- prior to the next meeting.

9 **DR. WADE:** Wanda --

10 **MR. GRIFFON:** I also would hope that -- don't
11 wait on me to update the matrix to -- to
12 proceed on the action, because it could take a
13 little while to sort these out and get them
14 into a matrix format; but I will follow up on -
15 -

16 **MS. MUNN:** Thank you. You have all those items
17 that can drop off now.

18 **DR. WADE:** Okay. I think we're done.

19 **MS. MUNN:** We'll see you in a couple weeks.

20 **DR. WADE:** See you soon. Be safe.

21 (Whereupon, the working group meeting was
22 adjourned at 4:30 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 March 28, 2006; 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 3rd day of May, 2006.

STEVEN RAY GREEN, CCR**CERTIFIED MERIT COURT REPORTER****CERTIFICATE NUMBER: A-2102**