

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

The verbatim transcript of the Working Group Meeting of the Advisory Board on Radiation and Worker Health held telephonically on June 8, 2006.

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TRANSCRIPT LEGEND

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-- "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.

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P R O C E E D I N G S

(9:32 a.m.)

WELCOME AND OPENING COMMENTSDR. LEWIS WADE, DFO

1 **DR. WADE:** This is Lew Wade, the Designated
2 Federal Official, but I'm not going to be on
3 beyond much of the introductions and then
4 Emily Howell will act in that capacity. If
5 you need any grand decisions made, Emily will
6 be available. So why don't we identify Board
7 members who are on?

8 **MR. GRIFFON:** Mark Griffon.

9 **MR. GIBSON:** Mike Gibson.

10 **DR. WADE:** Good morning, Mike.

11 **MR. PRESLEY:** Bob Presley.

12 **DR. WADE:** Good morning, Robert, how are you
13 feeling?

14 **MR. PRESLEY:** Very fine.

15 **DR. WADE:** And is Wanda on with us yet?

16 (no response)

17 **DR. WADE:** Why don't we identify then the
18 NIOSH team that's on the call?

19 (no response)

20 **MR. GRIFFON:** Okay. That'll take care of

1 that.

2 **MS. BRACKETT:** If you include the ORAU team,
3 this is Liz Brackett from ORAU team.

4 **DR. WADE:** Okay. Good morning.

5 **MR. McFEE:** Matt McFee from the ORAU team is
6 here as well.

7 **MR. KERR:** George Kerr, ORAU.

8 **MR. (UNINTELLIGIBLE):** (Unintelligible),
9 ORAU, Oak Ridge.

10 **MR. RICH:** Bryce Rich.

11 **MR. TANKERSLEY:** Bill Tankerlsey, ORAU.

12 **DR. WADE:** Good morning.

13 Do we have NIOSH on that line yet?

14 **MS. HOWELL:** This is Emily Howell.

15 **DR. WADE:** Good morning, Emily.

16 **MR. KATZ:** Ted Katz from Atlanta.

17 **DR. WADE:** Well, we're missing a key
18 component here, but we'll -- what about SC&A?

19 **DR. MAKHIJANI:** Arjun Makhijani.

20 **DR. WADE:** Good morning, Arjun.

21 **DR. MAURO:** John Mauro.

22 **DR. WADE:** Anybody else on the line who
23 wants to be identified?

24 **MS. MUNN:** This is Wanda. I'm on now.

25 **DR. WADE:** Oh, good morning, Wanda.

1 **DR. WADE:** Anyone else?

2 (no response)

3 **DR. WADE:** Emily, are you in a position
4 where you could give Jim Neton a call?

5 **DR. NETON:** Hello, this is Jim Neton.

6 **DR. WADE:** Oh, good. Good morning, Jim. We
7 were just --

8 **DR. NETON:** I apologize. I was in another
9 meeting and had to run down the hall to get on
10 this call. I'm here, and LaVon Rutherford is
11 here with me.

12 **CONFLICT OF INTEREST**

13 **DR. WADE:** Okay. Well, we just completed
14 the introductions. What we want to do is do a
15 little bit of conflict of interest discussion.
16 I mean, there are four Board members on the
17 call, not a quorum, so we're good to go there.
18 In terms of the Board members with conflicts,
19 Robert is conflicted on Y-12 and SEC petition.

20 Robert, I think you understand that if
21 -- you know, you can listen if there are
22 matters of fact that you feel need to be
23 brought up, that you know, please feel free to
24 suggest that, and then either Emily or Mark
25 can make a decision.

1 **MR. GRIFFON:** Emily can make a decision.

2 **DR. WADE:** We're glad that you're here to
3 join us though and thank you for making the
4 time available.

5 Jim, could you see to the conflict of
6 interest disclosures for members of the NIOSH
7 or ORAU team?

8 **DR. NETON:** Sure, yeah, this is Jim Neton of
9 NIOSH and I'm not conflicted at Y-12.

10 **MR. RUTHERFORD:** LaVon Rutherford, I am not
11 conflicted at Y-12.

12 **DR. NETON:** And members of the ORAU team
13 that are on the call, please identify yourself
14 and state your conflicts, if any.

15 **MS. BRACKETT:** This is Liz Brackett and I do
16 have a conflict with Y-12.

17 **MR. MCFEE:** This is Matt McFee. I do not
18 have a conflict at Y-12.

19 **MR. STEMPFLEY:** This is Dan Stempfley. I do
20 not have a conflict at Y-12.

21 **MR. (UNINTELLIGIBLE):** I do not have a
22 conflict at Y-12.

23 **MR. KERR:** George Kerr and I don't have a
24 conflict.

25 **MR. CHEW:** This is Mel Chew and I do not

1 have a conflict.

2 **DR. WADE:** And John, in terms of your team?

3 **DR. MAURO:** Yes, John Mauro, I do not have a
4 conflict.

5 **DR. MAKHIJANI:** Arjun Makhijani, I do not
6 have a conflict.

7 **DR. WADE:** Okay. I think that's really the
8 business of preparation. Mark, it's up to
9 you. Please take it from here.

10 **INTRODUCTION**

11 **MR. GRIFFON:** All right. I may be getting
12 ahead of myself assuming this, but I'm hopeful
13 that we won't meet till 4:30 today. I think
14 we've got a handful of issues that we have to
15 go through, but I'm expecting two-and-a-half,
16 three hours. I'm hoping we can wrap this up
17 by lunch.

18 I did e-mail an agenda. I hope people
19 got that. What I've done this morning is I've
20 went down my little e-mail agenda, and what
21 I'll do as we go through each item, I'll kind
22 of cross-reference. SC&A did send out a
23 report. I don't know if everybody received
24 that.

25 **DR. MAURO:** Mark, this is John Mauro.

1 **MR. GRIFFON:** Yeah.

2 **DR. MAURO:** No. What we did is we had this
3 internal draft --

4 **MR. GRIFFON:** Oh, okay.

5 **DR. MAURO:** -- that I did send to you and to
6 Jim --

7 **MR. GRIFFON:** And to Jim, yeah.

8 **DR. MAURO:** -- factual, accuracy review. It
9 is now -- you both have had an opportunity to
10 look at it, but I did not distribute it widely
11 since I didn't feel it was an official report.
12 I was mainly concerned that -- See, what I did
13 in preparing this draft is read the minutes of
14 the meeting from May 18th and did the best I
15 could to capture that. And I wanted to make
16 sure that in, I guess, conveying those, the
17 status of each issue, that I did capture it
18 correctly. So the only individuals that have
19 seen this early draft have been Jim and you,
20 Mark, and, of course, Arjun and myself.

21 **MR. GRIFFON:** Well, let me restate that
22 then. I've gone through and I might, you
23 know, your issue numbers track well with the
24 agenda. There might be one item that I added
25 which was -- which I'll get to after number

1 five, which didn't come up in my little agenda
2 but was in your report.

3 So the other thing that I'll do is as
4 we go down the agenda, I tried to crosswalk
5 the NIOSH action items from the last meeting,
6 and I'll just mention those and NIOSH can give
7 us an update of where they are. I think
8 they've provided a lot of stuff last night. I
9 haven't actually seen the latest, but they
10 have been adding stuff over the last week-and-
11 a-half into those action item folders. So
12 we'll just touch base on those I guess.

13 **MS. MUNN:** Mark, this is Wanda. At the risk
14 of sounding even more petulant than I actually
15 am, it's pretty difficult for us to evaluate
16 what we're doing this morning. We don't have
17 the material that the two primary parties are
18 actually looking at.

19 **MR. GRIFFON:** I agree. Well, --

20 **MS. MUNN:** It's a point that might be kept
21 in mind next time we have a group call-in
22 meeting.

23 **MR. GRIFFON:** Well, this has been a little
24 bit of a recurring theme. I mean, I think we
25 -- everybody's pressured to get -- to complete

1 action items and it ends up being down to the
2 last few days when we get materials.

3 **DR. WADE:** Wanda, this is Lew Wade. I do
4 have an item on the agenda for the Board
5 meeting next week to talk about, sort of work
6 group processes. And I think we need to sort
7 of address this reality that you raise.

8 **MS. MUNN:** It really would be very nice.

9 **MR. GRIFFON:** The only other thing I can say
10 is that there is stuff posted right on the O
11 drive in these action item folders. I don't
12 know if you have access to that during the
13 call, Wanda, but -- and I know it's far from
14 ideal, but --

15 **MS. MUNN:** No, I don't have access to it
16 period.

17 **MR. GRIFFON:** Oh, okay.

18 **MS. MUNN:** I've not been on through the
19 process of being instructed on how to do that.
20 And I guess if I'm the only Board member who
21 isn't doing that routinely, then I obviously
22 need to go out of my way to do more.

23 **MR. PRESLEY:** Hey, Wanda, you're not the
24 only one.

25 **MS. MUNN:** Well, now as a matter of fact I

1 think there are far fewer who do not access
2 that material and have not been instructed in
3 how to do so.

4 **DR. WADE:** I do think the reality -- this is
5 Lew Wade again -- is that everyone involved is
6 trying their most earnest to deal with issues
7 as they come up in almost near real time and
8 that results in this situation. And as Mark
9 said, it's far from ideal, and yet everyone is
10 really trying to do their level best.

11 **MS. MUNN:** I have no doubt of that.

12 **DR. MAKHIJANI:** Mark, it might be helpful on
13 the issues are exactly the same as in the
14 April 24th report --

15 **MR. GRIFFON:** Right.

16 **DR. MAKHIJANI:** -- and there is the status
17 of each issue. And if you'd like John or I
18 could go through as you raise the issues in
19 your agenda and provide a little statement of
20 the status.

21 **MR. GRIFFON:** Yeah, I think that would be
22 valuable, you know, a brief statement of, you
23 know, kind of where we are on that issue. I
24 think that's what we're here for is to say,
25 okay, each item and then -- and you can

1 probably -- that's a good idea, Arjun, that's
2 that previous report that SC&A provided. It's
3 the same issues, right. There's nothing
4 different.

5 **DR. MAKHIJANI:** No, there are no new issues.

6 **MR. GRIFFON:** No new issues, it's just that
7 the status is different in several of them.

8 Well, let's just try to proceed and
9 where we have to let's describe as best we
10 can, understanding that a lot of people don't
11 have all the materials in front of them.

12 So the first item I have -- Wanda, you
13 do have this agenda, right?

14 **MS. MUNN:** Yes, I do.

15 **THORIUM WORKERS CLASS**

16 **MR. GRIFFON:** At least, okay. The first
17 item I have is the thorium workers class. And
18 I guess there's a few things there that we had
19 a follow-up action item number six for NIOSH,
20 which was to look into those additional
21 buildings, I think. And then there's the
22 question of -- this question of how to
23 determine whether people worked in those
24 buildings.

25 So -- and this falls under SC&A's

1 report under issue number one, two, and eight.
2 It sort of covers all three of those, I
3 believe.

4 John, if you're following along will
5 you --

6 **DR. MAURO:** Yes, I am.

7 **MR. GRIFFON:** One, two, and eight. So maybe
8 I'll ask Jim to report first on your action,
9 what you found out as far as the thorium
10 buildings and the question of how this -- how
11 to put people in -- how to identify where
12 people worked.

13 **DR. NETON:** Let me just get situated here.
14 I'm pulling information together myself as we
15 speak. I'm trying to think of which issue
16 that was on our action item matrix so I can
17 bring it up.

18 **DR. MAKHIJANI:** I think it was six, Jim.

19 **MR. GRIFFON:** I have action item six as far
20 as what (unintelligible) yeah, yeah.

21 **DR. NETON:** I was just going to say I did --
22 for those who do have the O drive, there are
23 two attachments -- well, they're labeled as
24 two attachments. They're tables that
25 summarize what was learned from Mel Chew and

1 others' review of the -- Mel Chew, Bryce Rich,
2 Jack Beck, others -- review of the Mass
3 Balance Ledgers.

4 If you recall, they went in the
5 classified space and were able to summarize
6 what -- where thorium was moved about in the
7 Y-12 complex during the SEC period. This list
8 was, I think, available at the last meeting so
9 there's really nothing new here other than
10 we've summarized buildings that did not appear
11 in the proposed SEC class definitions that
12 possessed thorium.

13 That's what's listed as Attachment Two
14 in this on the O drive under action item six,
15 I think it is. And as at the last meeting,
16 there is one building, 92-01 dash 3 that
17 possessed what I would consider significant
18 quantities of thorium in three account numbers
19 during the SEC period. And they were listed
20 variously as aircraft reactor experiments,
21 reactor tech division control, SF control
22 department, but they're in the hundreds of
23 kilograms, up to 7800 kilograms in that time
24 period.

25 So we're looking very hard at this.

1 And as we indicated last time, we're going to
2 -- we're preparing a supplement to the
3 evaluation report to address some of these
4 issues related to the other buildings,
5 particularly this one 92-01 dash 3. There are
6 three other buildings listed, and those are
7 92-03, 92-13, and 99-95. They are essentially
8 Assay Analytical Laboratory-type buildings.
9 One is labeled Production Experiment, but they
10 possessed what I would consider small
11 quantities of thorium. One, the Assay Lab,
12 had 11 grams, and the one labeled Production
13 Experiment was 16 grams.

14 **MR. GRIFFON:** Which is the one labeled
15 Production Experiment?

16 **DR. NETON:** 92-13.

17 **MR. GRIFFON:** Okay.

18 **DR. MAKHIJANI:** I didn't have that from the
19 meeting, Jim.

20 **DR. NETON:** Yeah, that's new from the
21 meeting, and that's in Attachment Two that
22 I've summarized.

23 **DR. MAKHIJANI:** Oh, okay.

24 **DR. NETON:** So if you look on the O drive
25 under action item six. And then 99-95 is the

1 Analytical Lab and that had less than 500
2 grams between '53 and '57.

3 There is also a building listed with
4 no -- well, there's no identified building
5 with an account number ten, which is labeled
6 Control. And Mel Chew could probably speak
7 more to this, but it appears to be an
8 inventory control account that summarized the
9 existence of the thorium throughout all of the
10 processes. It does not appear to be
11 identified with any particular activity.

12 And there's one other account number
13 listed, which is 97 and that was labeled
14 Discarded Salvage Sent to the S-2 Pit. And
15 that quantity was 16 grams in 1952. That is
16 the extent of the Mass Balance Ledgers that
17 were reviewed for all years in the SEC period.

18 Based on this we don't believe that
19 there were any other activities since this is
20 a fairly complete list that processed thorium.
21 At this point we are working with the concept
22 that these smaller amounts of thorium, that
23 is, the 11 grams, the 16 grams, the less than
24 500, in our opinion were not related to
25 production activities, but they were

1 laboratory-type amounts that were used
2 particularly in the Assay Analytical Lab,
3 appear to have been used for calibration
4 sources standards testing, that sort of thing.
5 So it wouldn't really fall in the production
6 category and we are developing approaches --
7 we think we can develop approaches to bound
8 exposure so these small quantities.

9 There are a number of ways to go with
10 this. One approach is to use something like
11 New Reg 1400 that, for those of you who aren't
12 familiar with it, is a document that talks
13 about air sampling in the work place. It was
14 issued in 1993 and it had some -- actually,
15 bounding analyses one can do based on the
16 quantity of source that are present and what
17 fraction becomes re-suspended from the air,
18 and then you could modify the amount in the
19 air based on certain prophecies and
20 confinement practices, that sort of thing;
21 identify the nature of the material, whether
22 it was liquid, solid, gas.

23 We think that we can put a bound on
24 exposures in these laboratory-type buildings.
25 That, coupled with the fact that we do have a

1 large amount of air sample data after the SEC
2 period when large quantities of thorium were
3 being processed, there's both air sample and
4 fecal data that one could use to bound
5 exposures from what we would consider to be a
6 -- certainly a less error-intensive
7 environment, you know. There wouldn't be
8 generated as much airborne activity as a
9 laboratory process. So that's where we stand
10 with this right now.

11 **MR. GRIFFON:** Can -- just one question, and
12 you probably Mel is the one to answer this,
13 that item -- that account number ten, it does
14 have a wide range of (unintelligible)
15 kilograms to 9,682 kilograms. I mean, can you
16 enlighten us a little more on that, Mel?

17 **MR. CHEW:** I'd be glad to, Mark. Good
18 morning. That is basically control of value
19 as established in the ledgers that say if
20 someone asks you how much material of thorium
21 was present in total -- totality at Y-12 at
22 any one time that is the number basically
23 starts at the top of the ledger here. And
24 then when we go through the ledger it breaks
25 it down to where those particular materials

1 went to a specific materials, balances, or
2 facilities here.

3 So basically to answer the question if
4 someone asked if there was how much material
5 was there in total at Y-12, that is the number
6 under Control Ten, and that's why we've no
7 building listed here.

8 **MR. GRIFFON:** Okay. And that's pretty clear
9 from the ledgers.

10 **MR. CHEW:** Yes, it is.

11 **MR. GRIFFON:** Good.

12 **MR. CHEW:** And if you add up the numbers for
13 all the other materials that's sprinkled out,
14 it comes up to the total.

15 **MR. GRIFFON:** It does come up to the total,
16 yeah. It looks -- just quickly scanning it
17 looks like it would. Okay. Great.

18 **MR. CHEW:** Okay.

19 **DR. MAURO:** This is John Mauro. I've got a
20 question that sort of just jumped in my mind.
21 If New Reg 1400 provides some generic
22 methodologies for placing upper bounds on
23 let's say airborne exposures, and in theory
24 that methodology could be applied as a way of
25 bounding the doses to these buildings that

1 handle relatively small quantities of thorium,
2 is there any reason why those very same
3 methodologies couldn't be applied to buildings
4 that handle large quantities of thorium?

5 **DR. NETON:** That's a real good question,
6 John. The thought had crossed my mind. I
7 don't think so. I mean I wouldn't be
8 comfortable at this point doing that. I think
9 that the (unintelligible) one can make to say
10 that you've got a small quantity and you can
11 model it based on confinement and what process
12 there is. I feel comfortable with that. When
13 you start getting into hundreds of kilograms
14 of materials with various work activities
15 being conducted on them, I'm not sure.

16 **DR. MAURO:** I think this is an important
17 issue because in effect it represents a place
18 where, let's say, these generic methods break
19 down. That is, they're useful but only --
20 like 1400 -- but only to a certain degree.
21 And that divide becomes important because I
22 think in future situations we may encounter
23 similar types of problems.

24 So I think the rationale for making a
25 distinction between those situations where

1 1400 will serve you well and when it may not
2 is going to be important and needs to be aired
3 out a little bit.

4 **DR. NETON:** I agree, and to my knowledge
5 this will be the first time we've applied
6 1400, but I thought it was a very good
7 potentially useful document because of the
8 small quantities involved. Fourteen hundred
9 was really written in a lot of ways around
10 sort of confined quantities that were, you
11 know, had single processes. When you start
12 having arc furnaces and those type of things,
13 I don't think the selection, particularly for
14 your various confinement factors and your
15 mechanical agitation factors, fit in as
16 nicely. I agree with you.

17 **UNIDENTIFIED:** Yeah, Jim, that's exactly
18 correct.

19 **MR. GRIFFON:** Yeah, that's a good point
20 though, John. In going forward we should
21 think about where it can apply and when it,
22 you know, when it... We're sort of setting a
23 precedent here if you use that, so good point.

24 **DR. NETON:** The other thing that I felt
25 comfortable with is that if we have a lot of

1 air sampling and some -- and a fair amount of
2 thorium fecal samples later on that can also
3 be used as sort of sanity bounding checks. So
4 I think that the comparison of a major
5 production process in a laboratory environment
6 is a fairly obvious, you know, over-bounding
7 analysis and we could use that to also check
8 on the upper limits of our --

9 **MR. CHEW:** Jim this is Mel. Only add where
10 there was a significant amount of lung
11 counting that was done, too, in the process
12 (unintelligible).

13 **DR. NETON:** I'm not -- I don't mean to imply
14 that we would use the production numbers, but
15 it certainly gives us another (unintelligible)
16 to look at.

17 **DR. MAKHIJANI:** Could I ask a question about
18 there was S-3 ponds and the 97-20 dash 5
19 storage building issue that came up in the May
20 18th meeting. Where are we with those?

21 **DR. NETON:** The S-2 pit, which I believe is
22 the same as the S-2 --

23 **DR. MAKHIJANI:** Oh, is it the same as the S-
24 3 pit?

25 **DR. NETON:** I mean, I'm not sure of that.

1 Mel, do you know any more on the S --

2 **MR. CHEW:** Yes, let me -- Arjun, I'm hoping
3 this is an answer to your question. This is
4 account number 97. The S-2 pits stopped
5 operating, and we have it documented, in 1952.
6 The S-2 ponds were closed, neutralized and
7 filled. At the same time they were actually
8 started to put in the S-3 pits. But during
9 that particular time after 1962 the thorium
10 did not go to the ponds from Y-12. They were
11 actually disposed of at the X-10 burial
12 ground, and we have documentation to that
13 effect here, the quantities and during that
14 period.

15 **DR. NETON:** That's right. Thanks, Mel, I
16 forgot about that other document.

17 **MR. CHEW:** And that's actually documented in
18 the historical history of material account.
19 And so it's clearly stated in after the 1952
20 period the thorium went to the X-10 burial
21 grounds. That's why it does not show up in
22 the ledgers here any more after 1952 or the S-
23 2 pits.

24 **DR. MAKHIJANI:** So I guess, Jim, you would
25 cover the S-3 pond in X-10?

1 **DR. NETON:** It would be evaluated under an
2 X-10 analysis, yes.

3 **DR. MAKHIJANI:** Fine, so that resolves that.
4 And then just the one question about 97-20
5 dash 5 storage building.

6 **DR. NETON:** Right, well, it's certainly not
7 on a ledger, but I thought, Mel, we had
8 interviewed some people and indicated that
9 there may have been storage there.

10 **MR. CHEW:** That's right, and I think that's
11 about -- we know it is not indicated in the
12 ledger that we know of here.

13 Arjun?

14 **DR. MAKHIJANI:** Yeah?

15 **MR. CHEW:** Making sure we were going to be
16 addressing the question.

17 Say that again or ask the question
18 again about the building?

19 **DR. MAKHIJANI:** Well, in the site profile,
20 97 -- if I remember correctly -- 97-20 dash 5
21 is indicated as a storage building for thorium
22 and so we raised the issue in the April 24th
23 report, and it came up in May 18th. So I just
24 wondered what was the status of investigating
25 that, whether it should or should not be

1 added.

2 **DR. NETON:** Well, we certainly see no
3 evidence in the ledgers in the SEC period.

4 **MR. CHEW:** That's correct. Arjun, we looked
5 through ledgers very carefully and we did not
6 see the indication of that particular building
7 in the ledgers for the SEC period here.

8 **DR. MAKHIJANI:** I guess some documentation
9 of that since it has come up over the last
10 month maybe a one-page finding with a couple
11 of references might be useful so that then we
12 can refer to it in our report and say that
13 this is what NIOSH did and there is or is not
14 any -- try to put it to bed.

15 **MR. TANKERSLEY:** This is Bill Tankersley.
16 You do need to remember that mention 97-20
17 dash five is undocumented. It was originally
18 mentioned in the TBD, which came from the Chem
19 Risk, but there's actually no citation for
20 that.

21 **MR. CHEW:** Arjun, we agree to put together a
22 paragraph to address what you just suggested.

23 **DR. MAKHIJANI:** Okay, thanks.

24 **DR. NETON:** We'll do that.

25 **MR. GRIFFON:** Anything else on thorium at

1 this point? I guess the other side of this is
2 a Department question, Jim. If we're done
3 with the buildings, the question came up last
4 phone call as to how are we going to be able
5 to -- or how is the Department of Labor going
6 to be able to identify who worked in these
7 particular buildings for 250 days or whatever.
8 You know, how are they going to identify the
9 class that way?

10 **DR. NETON:** Right.

11 **MR. GRIFFON:** And we raised the question
12 that often Department numbers do not reflect
13 what buildings people worked in, though, and
14 that's often the only information they'll
15 have. They'll have job title and department
16 probably, and you've got survivors in many
17 cases who won't necessarily know where people
18 worked. So I talked to you a littler earlier.
19 I mean, I don't know if you've got any more to
20 --

21 **DR. NETON:** Yeah, I've actually asked this
22 of the Department of Labor this morning and
23 they really can't get much more, you know,
24 much more specific other than that they
25 believe that they can -- they have methods to

1 be able to qualify people, you know, based on
2 the -- which buildings they may have worked in
3 for which lengths of time. They do this
4 fairly routinely as part of this program.
5 Unfortunately, it's not something that we can
6 control, so I really can't say anything more
7 specifically than that.

8 **MR. GRIFFON:** I guess we've already -- I
9 don't know if Lew's on the call anymore, but
10 we have committed to getting Pete Turcic at
11 the meeting; is that correct? Is Lew -- Lew
12 might have hung up. But I know this last call
13 and I'm pretty sure we've -- and if not, I'll
14 follow up on that to make sure that Lew -- or
15 Pete Turcic from the Department of Labor is
16 available for the next meeting.

17 **DR. NETON:** Pete will definitely be at the
18 meeting.

19 **MR. GRIFFON:** Yeah, so we can question him
20 directly on -- I mean, I guess one of the
21 biggest concerns is we don't want to put the
22 onus on the -- especially a survivor to prove
23 that their spouse was -- or, well, the
24 claimant was in the building for 250 days. We
25 would hope that the burden was on the

1 plaintiff.

2 **MS. MUNN:** I thought we were pretty clear
3 about that.

4 **MR. GRIFFON:** Yeah, I think he was, too. He
5 was very clear about if they ever worked in
6 that building, but nobody ever really explored
7 it any further. I think we should follow up
8 and make sure they have a sound method for
9 figuring out who was in each building. I
10 mean, Y-12 is one of the more secretive
11 facilities in the nation, and I know that
12 spouses would unlikely know where their
13 significant other was working during that time
14 period or what they were doing.

15 **MS. MUNN:** I meant I thought we'd made it
16 eminently clear several times in open Board
17 meetings that that was not the case. And I
18 also thought that we had made it clear in our
19 own Board meetings that Turcic was going to
20 (unintelligible).

21 **MR. GRIFFON:** Yeah, I think we did, Wanda.

22 **MS. MUNN:** Certainly all the parties
23 involved ought to understand by now what
24 Labor's role is and -- what the Department of
25 Labor's role is and how they address it. I

1 don't think there's a site anywhere we're
2 going to be able to say Joe Blow spent 24
3 hours in this building and 48 hours in this
4 building. That's not going to happen
5 anywhere.

6 **MR. GRIFFON:** No, I know, right, right. I
7 guess from my standpoint I just want to
8 understand a little better of how they're
9 going to make that decision, and it sounds
10 that they're going to be very claimant-
11 favorable in their process, but they'll be
12 there again. There's no sense going over that
13 ground again, but --

14 **MS. MUNN:** I can't imagine they've changed
15 their position, which is (unintelligible).

16 **MR. GRIFFON:** Right, I'm not disagreeing
17 with you Wanda. I'm just saying that I don't
18 -- I want to make sure they understand the
19 difficulties and they may not be different for
20 other. It may be very similar to other sites.
21 You're right. So I think we're just going to
22 follow up with them at that meeting and that's
23 where that -- or just to get them on the
24 record again or clarify. And I think that's
25 all for that side of the issue, too.

1 Is there anything else there from SC&A
2 or others?

3 **MS. MUNN:** Does that leave any really
4 outstanding question that has to be hashed
5 over at the Board meeting with respect to
6 thorium? Are we all happy?

7 **MR. GRIFFON:** I think we're all happy.

8 **DR. MAKHIJANI:** Ms. Munn, from the SC&A
9 side, I don't know, maybe John -- I don't know
10 if I'm speaking out of turn, but it seems that
11 this last issue is something not reviewed by
12 us and for the Board and Department of Labor
13 to handle, and so other than that the issues
14 appear to be resolved. I mean, we haven't --
15 the only comment I would make is that Jim has
16 proposed a method for the small sources, which
17 we have not reviewed, and, of course, we don't
18 have to review that. It's just that it will
19 be developed, I guess, or published between
20 now and the meeting.

21 **DR. NETON:** I'm not sure we're going to have
22 this published before the meeting.

23 **DR. MAKHIJANI:** Oh, okay, right. So that
24 will be the one item that I would say is --
25 remains to be on the table, a proposed method.

1 I mean, I understand what the method is that's
2 being proposed.

3 **DR. NETON:** I think we just need to maybe
4 come to a conclusion because -- come to a
5 conclusion maybe that this method would
6 provide for a bounding analysis.

7 **MR. GRIFFON:** Yeah, it's appropriate.

8 **DR. MAKHIJANI:** I'm not disputing that at
9 all. I mean, I have looked at New Reg 1400,
10 if I remember correctly in the distant past,
11 but --

12 **DR. NETON:** There's application conservative
13 assumptions in there.

14 **DR. MAKHIJANI:** Right, right, I'm not
15 arguing with that. I'm just saying that this
16 is the one technical item that has come up new
17 in this meeting.

18 **DR. NETON:** And that's for these three very
19 small source quantities of thorium that --

20 **DR. MAKHIJANI:** That's correct. I'm not
21 raising a particular concern about it. I'm
22 just flagging.

23 **DR. MAURO:** Mark and Wanda, this is John
24 Mauro. One of the dilemmas that SC&A has is
25 that in effect we will move on and look into

1 any issues that the working group deems
2 necessary. So I don't automatically assume
3 that when, for example, let's say, this New
4 Reg 1400 strategy emerges that necessarily
5 SC&A will look at that. We will only look at
6 those items that the working group feels needs
7 to be followed up on.

8 So right now the issues that we have
9 addressed and have tried to write up in our
10 April 14th report, and in the latest version
11 of that report that only some of you have seen
12 in draft form, you know, the reality is that I
13 don't see it as our mandate to automatically
14 move forward on these unless we are directed
15 to do so.

16 So really I would look to Mark and
17 Wanda and the rest of the working group to
18 give, for example, at the end of this
19 conference call it would be very helpful to me
20 if you folks would provide direction regarding
21 which areas you would like us to look into and
22 whether or not you would like a work product
23 related to those matters to be delivered as
24 soon as possible, et cetera. So that would be
25 very helpful to us in this situation.

1 **MR. GRIFFON:** Yeah, I agree, John, and I
2 think at this point I don't see any further
3 action for thorium, but I think at the end of
4 this call we might say we want SC&A to review
5 the supplement and be prepared to discuss at
6 the next Board meeting. But beyond that,
7 we'll wait till the end, but I think that's
8 probably where we're going to stand.

9 **DR. MAURO:** I'll keep that in mind.

10 **MR. GRIFFON:** Yeah. Okay. All right.
11 Moving on to number two if that's okay.

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

13 **CYCLOTRON WORKERS**

14 **MR. GRIFFON:** Number two, cyclotron workers,
15 and I put this -- this should cover issues
16 number 10 and 12 from the SC&A report which
17 are the polonium and the exotics, I believe.

18 **DR. NETON:** That's correct.

19 **MR. GRIFFON:** And I didn't have any
20 particular action for NIOSH on this, but I
21 think the general action was that Jim had
22 stated that you were going to follow up on
23 just how to handle the cyclotron workers and
24 whether you needed a supplement or how this is
25 going to proceed.

1 **DR. NETON:** We're working on a supplement
2 for that issue and hopefully after we conclude
3 this call we'll be able to wrap up our
4 supplement and issue it hopefully tomorrow.

5 **MR. GRIFFON:** But can you give us some sense
6 of the direction?

7 **DR. NETON:** Yeah, we have not been able to
8 locate any additional information for the
9 cyclotron workers whether it's polonium or the
10 exotic radionuclides. So I think we're in
11 agreement that it would be very difficult for
12 us to do a dose reconstruction.

13 **MR. GRIFFON:** And then the same question,
14 how are you going to define who worked --

15 **UNIDENTIFIED SPEAKER:** Hello?

16 **MR. GRIFFON:** -- at the cyclotron?

17 Hello. Hello.

18 **MR. GRIFFON:** Everybody there?

19 **UNIDENTIFIED:** We're all here.

20 **DR. NETON:** I don't know what you heard, but
21 we definitely, I think, are of the opinion
22 that we would have difficulty doing these dose
23 reconstructions with sufficient accuracy.

24 **MR. GRIFFON:** But then in follow up was how
25 are you going to define who worked in those

1 areas? And the reason I raise this is not to
2 broaden but really to narrow. I hope that we
3 --

4 **DR. NETON:** I think that the definition, if
5 we come to that, will be very similar to the
6 thorium workers, which is we'll cite the
7 building number and list those workers who
8 were monitored or should have been monitored
9 for work activities related to the cyclotron.
10 And then that would be again a Department of
11 Labor determination as to how to --

12 **MR. GRIFFON:** And we hope that there's
13 information because everything we've heard is
14 that there wasn't a lot of people in those
15 areas. So we hope that there's something
16 available that can help DOL to narrow that --

17 **DR. NETON:** Exactly.

18 **MR. GRIFFON:** All right. I guess we wait
19 for the supplement on that.

20 Is there any other follow up on that
21 issue?

22 **DR. MAKHIJANI:** No, but just for the
23 information in the draft report that John
24 talked about that is the thrust of the
25 conclusion that we've made also in reviewing

1 the data so there is essentially full
2 agreement on this question.

3 **MS. MUNN:** Have I been misleading to think
4 that (telephonic interference) that it appears
5 there seems to be no real evidence that
6 anything transpired that would cause either
7 the polonium or other exotic radionuclides to
8 be significant issues (unintelligible).
9 That's been the general feel of what I have
10 seen. Am I incorrect in that?

11 **DR. NETON:** Wanda, you were breaking up a
12 little bit so I couldn't get your whole -- I
13 think I got the gist of what you were saying
14 and I'll try to respond.

15 For polonium there's definitely
16 evidence that there were fairly large airborne
17 releases into the environment, but because the
18 polonium targets were not clad, and they were
19 bare targets, and this was the first activity
20 they undertook in the cyclotrons and they had
21 a persistent alpha contamination problem for
22 quite a period of time. We have no bioassay
23 data for that. We do have an indication of
24 the relative levels that they measured, but as
25 we discussed at the last meeting whether or

1 not or that we could extrapolate accurate
2 exposures from the limited air monitoring data
3 we have.

4 For the exotic radionuclides it's true
5 that these were clad and the only time
6 exposures possible is when there's a failure
7 of the cladding. We've not seen any evidence
8 of that in this period. We do have outside
9 the SEC period in reports that indicate fairly
10 large breaches of things like gallium-67 and
11 such, which led us down this path thinking
12 that these were going to be well documented
13 through the entire operating period of the
14 cyclotron. We have not come up with those.
15 And we just really don't know what the ambient
16 levels of internal exposure may have been
17 during the SEC period for the cyclotrons.

18 **MS. MUNN:** Well, I guess what I'm really
19 pushing for here is are we going to be in the
20 position with not just this site but all sites
21 that if in the absence of documentation of
22 incidents we're going to assume nevertheless
23 that they occurred? Because that's -- I'm
24 having a little trouble accepting that as
25 being a reasonable approach.

1 **DR. NETON:** I agree with you, Wanda. I
2 think in this particular case we do have
3 evidence that there were ruptures of the
4 (unintelligible) and also the polonium issue
5 persisted for several years. It's not that
6 there's no indication; it's just that we have
7 an indication, but we don't have good follow-
8 up data.

9 **MS. MUNN:** So do we -- We don't really have
10 closure here, do we, or are we just still
11 hanging where we were?

12 **MR. GRIFFON:** We're waiting on a supplement
13 for the report, I guess, is where we're --

14 **MS. MUNN:** Yeah, but my question is, and
15 this supplement, is it going to put any of
16 this to bed? Are we still going to be exactly
17 --

18 **MR. GRIFFON:** I think they're going to
19 propose some of these people being in an SEC
20 class.

21 **DR. NETON:** Right.

22 **MR. GRIFFON:** That's the -- putting it to
23 bed I guess.

24 **MS. MUNN:** Yeah, it is.

25 **MR. GRIFFON:** And I mean, maybe I'm reading

1 between the lines, but I think you have
2 external monitoring data from most of these
3 people, but the internal would be the
4 question.

5 **MS. MUNN:** Yeah, I had thought we had --

6 **DR. NETON:** That's correct. We do have
7 external monitoring data for most.

8 **DR. MAURO:** This is John Mauro. Regarding
9 the polonium-208 question, I wasn't quite sure
10 how you would come out on that in light of the
11 fact that you do have, I guess, 60 airborne
12 measurements and you do have some language
13 that says no one would enter an area where the
14 airborne concentrations were in excess of -- I
15 believe it was 70 dpm per cubic meter. I get
16 the sense that that alone -- this again
17 becomes a precedent that might be important.
18 That alone is not adequate for you to feel
19 that you could put in place a plausible upper
20 bound on what these workers may have
21 experienced.

22 **DR. NETON:** That's correct. The use of
23 respiratory protection we've never taken
24 credit for, and you'd have to get into the
25 whole issue of the documentation and the FIT

1 programs and portions of the usage so we don't
2 take credit for that. Plus the fact that we
3 don't have any indication of what types of air
4 samples these were. They could have -- you
5 know, where they were in time and space
6 related to what was going on and that sort of
7 thing.

8 **MS. MUNN:** But isn't it reasonable if the
9 practice was to avoid entry to take the
10 position that that would be a bounding dose?
11 What am I missing here?

12 **DR. NETON:** Wanda, I think what they stated
13 in their health physics program was that they
14 did not -- workers were entering the areas,
15 but were required to wear respiratory
16 protection when they believed that the
17 exposures were over 70 dpm per cubic meter
18 which is, I think, roughly equivalent to the
19 maximum allowable air concentration for
20 polonium-208.

21 **MS. MUNN:** No, what we're saying is even
22 though we have indication of what standard
23 practice was and what's the expectations of
24 management was for the workers, we won't
25 accept that because somebody might not have

1 done what they were expected to do? Is that
2 going to be our position at all these sites?
3 If it is, we're just setting ourselves up for
4 an impossible situation.

5 **DR. NETON:** Well, again, if they were
6 required to wear a respirator, we don't know
7 anything about their FIT test program, the
8 adequacy of that, and how do you put a cap on
9 that then? Is a respiratory-protection factor
10 of ten appropriate? Is it not?

11 **MS. MUNN:** But that still begs the question
12 of whether we're going to accept that any of
13 the management practices that were established
14 for any of these sites can be accepted as
15 having any value at all. There's always going
16 to be a yes/but, that we can throw in on the
17 basis of the assumption that someone may not
18 have done what they were supposed to do, and
19 therefore we can pursue that endlessly.

20 **MR. GRIFFON:** I think in this case, Wanda,
21 it's a combination of you have that statement
22 but you don't have other data. There's a lack
23 of other information to sort of corroborate
24 that. And that's where, I think, that's why
25 NIOSH is coming down this way. I mean, if you

1 had that statement and other data to support
2 that or more information about that other data
3 you don't even know what kinds of sampling, et
4 cetera. You have one line in one health
5 physics report that says they -- that was
6 normal practice. But I don't -- you know, I
7 think that's why NIOSH is going down this
8 path. And additionally, you only have this
9 for polonium, not for the other nuclides which
10 were also in the cyclotron area.

11 **MS. MUNN:** Well, you understand I'm not
12 trying to be argumentative. I'm just trying
13 to establish are we ever going to accept the
14 documentation that we have with respect to
15 standard operating procedures or is this going
16 to be -- is this the precedent that we've
17 already set? That we don't believe anything
18 unless we have what someone else considers to
19 be what someone in this -- even in this group,
20 considers to be adequate documentation? Is
21 that what we're -- are we saying we have to
22 have multiple sources of information to verify
23 that --

24 **MR. GRIFFON:** Well, it depends on the one
25 source I suppose. But if I have one statement

1 that says we always were within the regulatory
2 limits, I'm not sure that's as convincing as,
3 you know, one source of urinalysis data for
4 everybody. I mean, I get the --

5 **MS. MUNN:** Or is multiple report showing as
6 much?

7 **MR. GRIFFON:** Right, I mean, I understand
8 what you're saying. I don't think we
9 disregard what standard practices were, you
10 know.

11 **DR. MAURO:** Jim, this is John. Would I be
12 correct in assuming that this would be -- this
13 situation where you have a respiratory-
14 protection program but no bioassay program is
15 unusual? That is, in general they sort of go
16 hand-in-hand?

17 **DR. NETON:** That's pretty much, yes.

18 **DR. MAURO:** So it's probably one of the rare
19 times when we've encountered, or so far, a
20 situation where a claim for a respiratory-
21 protection program is put in place, but they
22 didn't have a commensurate bioassay program to
23 confirm the effectiveness of the respiratory
24 protection program?

25 **DR. NETON:** Actually, there may be bioassay.

1 This is part of the issue. We just can't find
2 it.

3 **DR. MAURO:** Oh, I see, okay.

4 **DR. NETON:** I don't know there is or not.
5 We're just -- have not been able to locate it,
6 but our well has run dry here in several
7 attempts.

8 **DR. MAURO:** So that would be the lynch pin
9 here. If you were able to uncover bioassay
10 data confirming, that would really change the
11 landscape of this problem considerably?

12 **DR. NETON:** I think so. I think we sort of
13 adopted a weight-of-the-evidence approach
14 here, and there isn't a lot of weight of the
15 evidence here. We do have statements saying
16 they were trying to follow some good
17 practices, but they, in fact, have produced
18 thousands of curies of material over this
19 timeframe and we don't have one shred of
20 bioassay to document what type of exposure
21 these workers may have encountered.

22 **MR. GRIFFON:** The other important point that
23 I'm weighing in this equation, Wanda, is --
24 and this is why I keep asking about the people
25 involved because I'm getting the clear

1 impression that there weren't many people
2 involved in these operations so that we have a
3 limited number, and, in fact, I recall maybe
4 two of the claimants. So the question is do
5 we -- does NIOSH continue to unearth the
6 vaults down at Y-12 and look for more data or
7 at some point you've got to just say, you know
8 what, it's a very limited number of possible
9 claimants. At this point we don't have
10 enough. Let's just concede that we can't do
11 it with -- if there was a bigger population,
12 I'd say, you know what, we really have to dig
13 a little more and get our hands on this
14 because we can't just assume that all of these
15 people -- I guess that's what I'm weighing
16 into it, too, is the number involved. And I
17 would hope that we can keep this population
18 narrow by the way we define this class.

19 **MS. MUNN:** Well, I hope so, too.

20 **MR. GRIFFON:** Yeah, I don't disagree with
21 you there.

22 **MS. MUNN:** I'm really concerned that we fall
23 into a trap if we begin to broaden our scope
24 of what the SEC should and should not cover.

25 **MR. GRIFFON:** Yeah, and I don't think we're

1 setting any sort of broad precedence. I think
2 we've got to be very careful that, you know,
3 there are certain circumstances here that are
4 leading up to this or leading NIOSH to this
5 conclusion.

6 **MS. MUNN:** Well, we don't need to continue
7 berating this subject for my benefit.

8 **MR. GRIFFON:** No, it was worth discussing.
9 I appreciate that.

10 Jim, did you have anything else to add
11 to that?

12 **DR. NETON:** No.

13 **MR. GRIFFON:** I didn't misspeak, did I?

14 **DR. NETON:** Oh, no.

15 **MR. GRIFFON:** The number of claimants is
16 very small for these, I believe. That was
17 something you guys had said before that --

18 **DR. NETON:** There's a small number of
19 workers involved. And this is -- the pattern
20 that I see, if any emerging here, is that many
21 of the sites did a fairly credible job
22 monitoring the big ticket items that was their
23 bread and butter. For example, I think we
24 have some very good evidence for backing
25 uranium exposures both internal and external.

1 **MR. GRIFFON:** Right.

2 **DR. NETON:** But then there's always these
3 sort of small pockets of activity relative to
4 the whole site that just for some reason don't
5 appear to have as robust data available. And
6 this is one of those situations where when you
7 pull the thread, it just doesn't end on the
8 side of plausible upper bounding.

9 **MS. MUNN:** Well, yes, I guess my fear is
10 when I look at something like the list of
11 annual cyclotron and calutron products that
12 was printed up for us. I look at that and
13 think, boy, this is true at many sites. So
14 are we going to continue to have these kinds
15 of issues about each of these potential
16 products or by-products arise every time you
17 look at an SEC? Because this is -- well,
18 we're just going over the same material again.
19 We can move on.

20 **MR. GRIFFON:** You're right to raise the
21 issue though because we want to keep an eye
22 out for that in the future.

23 **PLUTONIUM EXPOSURE**

24 If it's okay, let's move on to
25 plutonium, number three, plutonium exposure.

1 treated with that same sort of coworker model.
2 But I don't think that this is a new issue or
3 any expansion on this current issue. I think
4 that I believe the proposed model will bound
5 those workers, if they're different workers,
6 you know, but I think it's just the laboratory
7 operation that supported that production
8 operation probably.

9 If you can just follow up on the
10 history there, and then maybe give us a brief
11 statement as to, yes, this occurred and we
12 believe the proposed model will bound those
13 workers as well then I think I would be
14 satisfied. And I will also try to get those
15 references to you so you, you know, we're
16 speaking from the same document.

17 Is that okay, Jim?

18 **DR. NETON:** Yeah, that's fine. We need to
19 get the documents though so we can figure out
20 what we're dealing with.

21 **MR. GRIFFON:** As far as I'm concerned this
22 issue is satisfactorily addressed now and I
23 think SC&A is in agreement with that, too.

24 **MS. MUNN:** You just want something saying
25 so?

1 **MR. GRIFFON:** I just want something saying
2 that these workers in 92-05 will fall in that
3 same category. People, you know, that worked
4 in that building would also be covered by that
5 coworker model. And I'll get those even if I
6 have to fax those. They're just one-sheet
7 summary tables so worst case I can fax those
8 documents to you, Jim, and go from there.

9 Anything else on that one?

10 **DR. NETON:** I'm good.

11 **MS. MUNN:** Sounds like it's your issue.

12 **MR. GRIFFON:** Can we -- let me just, if I
13 could, can I skip ahead to agenda item six and
14 seven? Because I think those are going to be
15 fairly quick and then we can spend the bulk or
16 the rest of the time on four and five. Four
17 and five are going to be a little lengthier
18 discussions maybe.

19 **NEUTRON DOSE**

20 But number six was the neutron dose,
21 and I think the only thing here was that Arjun
22 was looking for action item eight I believe it
23 is. Arjun was looking for some documentation
24 that would support that the highest-exposed
25 workers were monitored, and I think that's

1 addressed; am I correct?

2 **DR. MAKHIJANI:** Yes, that's done. I think
3 NIOSH has put up a document and that's
4 settled. And they actually have documentation
5 to that.

6 **MR. GRIFFON:** And that's settled and you're
7 okay with that?

8 **DR. MAKHIJANI:** Yes.

9 **MR. GRIFFON:** Okay, so that's off the table.
10 Everybody agree with that?

11 **DR. NETON:** Yes.

12 **RECYCLED URANIUM**

13 **MR. GRIFFON:** All right. And item seven is
14 recycled uranium, and the question here was
15 the example case, I think, where the -- there
16 was a factor of one over ten. I guess the
17 intakes were divided by ten I believe is what
18 was the question and why was that done or
19 something to that effect.

20 **DR. NETON:** Right, it turns out that I think
21 one of the examples was divided by ten and one
22 wasn't. I might have to rely on -- is Liz
23 Brackett still on the phone?

24 **MS. BRACKETT:** Yes, I'm here.

25 **DR. NETON:** I'll take a quick shot and maybe

1 Liz, you can chime in. There's been a change
2 in the site profile, and the logic was just to
3 reflect the recent changes which was --

4 **MR. GRIFFON:** Jim? Hello, Jim, you cut off
5 there. There's still a loud buzz, but we can
6 hear you.

7 **MS. MUNN:** You sound like you're in a
8 machine shop.

9 **DR. NETON:** It's not in this room, but the
10 factor of ten was put on those -- the upper
11 bound of the range of recycled material -- the
12 range of the recycled contaminant, and it was
13 in the site profile now I believe it reads
14 that if you're doing a -- what we would
15 consider a best estimate, a reasonable dose to
16 assign would be to divide those by ten and use
17 that value.

18 Liz, you can put a little more on the
19 rationale behind that if you could?

20 **MS. BRACKETT:** Well, I mean the rationale of
21 that factor of ten would be from kind of a TBD
22 Office. (Unintelligible) TBD that says the
23 best estimate would be to take those values in
24 Table 5-8 and divide it by ten, and so best
25 estimate is best estimate. It means that it's

1 applicable to anybody, and that's the current
2 interpretation of the TBD. It may be that we
3 need to revisit that, but that's what it
4 currently says; and so that's what's being
5 applied in some cases.

6 It's my understanding that
7 (unintelligible) do that regularly, but they
8 do apply the full Table 5-8 for a number of
9 them. But the tool that was developed to run
10 that for coworker has that factor of ten built
11 into it, the reduction by a factor of ten.
12 We're actually in the process of modifying
13 that right now to give the option of both of
14 them. I think maybe we need to discuss this
15 as to whether that factor of ten is
16 appropriate or not.

17 **DR. NETON:** So you can see that this is
18 rethinking on our part down this path. If I
19 might say that it's not necessarily an SEC
20 issue --

21 **MR. GRIFFON:** I was just going to say that,
22 yeah.

23 **DR. NETON:** -- it's a matter of whether it's
24 reasonable to divide by ten or not.

25 **MS. BRACKETT:** Right.

1 **DR. NETON:** I think the logic path behind
2 this is that we really don't encourage us to
3 put out overestimates for best estimates. You
4 try to give it the best shot you can and I
5 think that's part of that spirit, but in my
6 mind I'm not a hundred percent convinced yet
7 that this -- we can reduce that by a factor of
8 ten, but that may be our best estimate. So I
9 think at this point we sort of got caught in
10 the transition on the approach.

11 **MR. RICH:** Jim, this is Bryce. Could I just
12 add a note or two of philosophy? When these
13 numbers were put together, you know, the
14 estimates and looked at the fundamentally the
15 maximum results that were reported, if you
16 look at a historical average for workers that
17 worked in a wide variety of facilities over a
18 long period of time, the average numbers
19 really do mean something. And they
20 functionally come out about a factor of ten
21 lower than the maximum values that were
22 reported.

23 And so as a consequence that fact was
24 demonstrated in the tables and clearly
25 indicated in the technical-basis document with

1 an option available to the dose reconstruction
2 folks that if you want the best estimate, the
3 most likely dose, then you would use something
4 less than the maximum values which were really
5 a bounding estimate. With that in mind,
6 that's just an additional comment, Jim.

7 **MR. GRIFFON:** This is a broader discussion,
8 but I think you've got to be careful with that
9 because I think a best estimate for the
10 average worker, yes, I would agree with that
11 analysis, Bryce, but then you get into the
12 situation of who was more likely exposed to
13 the recycled uranium and would they be more
14 towards the high end than an average. So
15 that's -- I guess, I agree with Jim. I don't
16 think this is an SEC issue because I think
17 you've demonstrated that you can bound, but
18 the question of how it's applied might need to
19 still be pursued a little.

20 **MR. RICH:** Yes, you know, the data reported
21 over long periods of time, obviously, anyone
22 given process would vary somewhat. And so
23 what we have done is gone through and looked
24 at the reasonable upper bounds and recorded
25 those as a default, which would indicate if

1 you applied a default to everybody you would
2 have a high degree of assurance that you did
3 not miss any dose at all.

4 **MS. MUNN:** But you also have a high
5 assurance that --

6 **MR. RICH:** But it also -- logic would tell
7 you that it would result in exposures that
8 were unrealistically high for --

9 **MR. GRIFFON:** For many of them or a lot.

10 **MR. RICH:** -- for most of the -- and so, you
11 know.

12 **MR. GRIFFON:** I know. There's the dilemma
13 right there.

14 **MR. RICH:** Yeah.

15 **MR. GRIFFON:** Okay.

16 **MR. RICH:** But it does come out of a factor
17 of ten from the average to the reasonable
18 upper bound for plutonium and neptunium, a
19 little bit different for thorium and
20 technetium, but that's recorded in the
21 technical basis.

22 **MS. BRACKETT:** I don't know that these doses
23 are really significant at these levels.

24 **MR. RICH:** That's true.

25 **MS. BRACKETT:** So it might just be that we

1 could apply the upper bounds to everybody and
2 not have a significant impact on the outcome
3 of (unintelligible).

4 **MR. RICH:** It is primarily -- conceptually
5 the conceptual issue that --

6 **MS. BRACKETT:** Right.

7 **MR. RICH:** -- that we're actually dealing
8 with, and in some cases we've already dealt
9 with the issue of the raffinates and in some
10 parts of some plants, particularly in the
11 gaseous diffusion plants, the recycled uranium
12 can be controlling. And so you really do have
13 to Mark, you have to be careful that you don't
14 underestimate some classes of workers.

15 **MR. GRIFFON:** Okay. But I think we can --
16 is everyone in agreement that this is not an
17 SEC issue necessarily? We want to follow this
18 for purposes of how it's going to be applied,
19 but I don't think it's an SEC issue. Is that
20 the general consensus here?

21 SC&A, I haven't heard from you.

22 **DR. MAURO:** Yes, that is -- our concern that
23 we originally raised went more toward the
24 raffinates and slag where there was a re-
25 concentration possibility of the transuranics,

1 et cetera, during the process. And we were
2 convinced based on the latest information
3 provided that under those circumstances there
4 are two factors that are working to allow a
5 bounding analysis.

6 One is you go to the factor of ten
7 number, I guess the values that are in Table
8 5.8. And there's evidence that those
9 concentrations are, in fact, even higher than
10 those in the raffinate and the slag. And
11 second, when you factor in the fact that
12 people handling the raffinates and slag only
13 handling it for relatively a small percentage
14 of their time. So you put those all together,
15 our concerns regarding RU are no longer there.
16 We're satisfied that this is very much a
17 tractable issue.

18 **DR. MAKHIJANI:** Yes, basically the question
19 is as Jim has been saying, you know, what's
20 the appropriate approach and factor, but that
21 is not an SEC issue.

22 **MR. RICH:** Okay.

23 **DR. NETON:** Just for the record, we did put
24 our response to that item in the folder for
25 issue number nine.

1 **MR. GRIFFON:** I think we're on to item -- go
2 back to item four. I'm just looking at the
3 time. All right, item four.

4 **MR. KERR:** Can I say something? This is
5 George Kerr.

6 **MR. GRIFFON:** Sure.

7 **MR. KERR:** Jim, like I told you, I've got to
8 cut out of here. I've got a dental
9 appointment coming up.

10 **MR. GRIFFON:** I can relate to that. I was
11 in the dentist the last couple of days.

12 **MR. KERR:** So I'm going to have to hang up,
13 okay?

14 **MR. GRIFFON:** Okay. I should have done your
15 item earlier. I'm sorry. I apologize.

16 **DR. NETON:** I knew that and it slipped my
17 mind as well.

18 **MR. GRIFFON:** Well, Jim, I'm sure you can
19 handle it fine on your team.

20 **DR. NETON:** We can work through this.

21 **DATA VALIDATION**

22 **MR. GRIFFON:** So number four is data
23 validation, and I think it overlaps. Now,
24 four and five there's some overlap, but I
25 would line this up with issue number three and

1 four in SC&A's report and NIOSH action items
2 number one, four, and five.

3 And I guess I can start off with data
4 validation since the last meeting. Action
5 item number four is that NIOSH will provide
6 the identified databases for external and
7 internal, and those have been posted for
8 several days now. I can't remember the exact
9 date, but probably over a week at this point.
10 And given that, I was able to look at some of
11 the previously provided reports and crosswalk
12 them with the identifiers.

13 And so that was part of what I was
14 doing with the -- for both external and
15 internal -- some of the reports provided on 5-
16 18 that had names of people, I think, lists of
17 people with their cumulative exposures and
18 also some excerpts showing bioassay averages
19 and things like that.

20 And then additionally, I think action
21 item one, NIOSH provided additional
22 information for the time period that seemed to
23 be a little bit of -- well, I think it was
24 sort of an additional request that we have
25 more information for the '57 to '65 time

1 periods, since the coworker model was going to
2 be relying on that data to back extrapolate.
3 And you have posted items under action item
4 one, and maybe you can summarize that for us,
5 Jim or LaVon.

6 **DR. NETON:** Yeah, LaVon's here, and I think
7 he's prepared to give a brief summary of what
8 we've done in that area.

9 **MR. GRIFFON:** It's mostly health physics
10 report reviews, I think, again, right?

11 **MR. RUTHERFORD:** And I think Bill Tankersley
12 --

13 Bill, are you all online?

14 **MR. TANKERSLEY:** Yes.

15 **MR. RUTHERFORD:** Bill will -- I will do this
16 briefly, and Bill can get into the detail
17 because Bill was actually the one that did
18 this.

19 There were actually multiple
20 comparisons that took place. If you look in
21 the folder under issue one there was a
22 document that kind of outlined the
23 comparisons, inter-company correspondence that
24 identified some exposure readings and compared
25 that to an electronic database and for 1958 or

1 actually summarizes '57 monitoring results.

2 He also took some quarterly readings
3 from a quarterly health physics report in '62
4 and compared skin doses and the penetrating
5 doses against the database. He did that as
6 well for the third and fourth quarter of '62
7 and then he did virtually the same thing for
8 the -- a report for the third and fourth
9 quarter of 1963, or the fourth quarter of 1963
10 and the fourth quarter of 1964, and did some
11 comparisons of the number of employees and the
12 skin dose readings. And I'll let Bill go into
13 more detail on that.

14 **MR. TANKERSLEY:** Well, I'm glad to, but I
15 guess I'd rather respond to any questions.

16 **DR. NETON:** That's certainly fine.

17 **MR. RUTHERFORD:** Mark, have you guys had a
18 chance to take a look at that?

19 **MR. GRIFFON:** Well, I have not looked at the
20 new stuff as much as the older stuff because
21 I've had that for a little longer. But I do
22 have a general request on some of the reports
23 previous than the current ones that compare
24 that data, and I know that we're interrupting
25 Bill's vacation, too, so I apologize for that,

1 but one thing that I had difficulty -- for
2 instance, I'm looking at the '57 to '65
3 external data validation. It's hard -- some
4 of these titles look very similar on some of
5 the documents, but I think that's the name of
6 the file itself. And I actually made attempts
7 to compare -- I think this is the one, compare
8 department averages.

9 Now, I don't have a lot of the health
10 physics reports and I would ask Jim to the
11 extent that they're now through classification
12 if those can be posted; any ones that are
13 through classification anyway. I know some
14 still might be held up.

15 But then taking the average, for
16 instance on this one table, you have
17 Department 2003, the average millirem per week
18 from the report and then the average norm per
19 week from the database, and for some
20 departments I matched up very well. It was
21 usually when the numbers of people were very
22 low. For the departments like 2701 with a lot
23 more people, my numbers dropped way off. And
24 I'm assuming it's something to do with how --
25 Bill, how you calculated the average from the

1 electronic database. It may be you didn't use
2 zeros when the zeros were there. I mean, all
3 I was asking maybe in the next -- well,
4 hopefully before the Board meeting, but I know
5 you're out of town, but I just want a
6 clarification on the method of how you came up
7 with these.

8 **DR. MAKHIJANI:** I cannot hear at all, excuse
9 me.

10 **MR. GRIFFON:** Oh, you cannot hear, Arjun?

11 **DR. MAKHIJANI:** No, I cannot hear Bill at
12 all.

13 **MR. TANKERSLEY:** I haven't talked in the
14 last while. I can respond a little bit to
15 that. First off, I would always include the
16 zeros if they are in the file.

17 Now, Jim, was this the comparison of
18 where they were, you know, many of which were
19 really quite close but there were three or
20 four that were quite different? Is this the
21 comparison that Mark is talking about?

22 **MR. RUTHERFORD:** Yeah, Bill, this is
23 actually the first comparison is that used the
24 inter-company correspondence against the
25 electronic database. And the 2003 department

1 averages were right on; 2702 it was a little
2 different, 98 to 83. And there were some
3 differences as you go --

4 **MR. GRIFFON:** But they're actually still
5 very close compared to when I did these. I
6 came up with numbers for those larger
7 departments like 2701; I came up with much
8 lower numbers. You have 67 reported and you
9 calculated 61 millirem per week. I came up
10 with values in the 20's, I believe. I'm
11 shuffling papers here, but I know my number
12 was way lower. And I thought maybe you used
13 MDL for the zeros, but that's not the case.

14 **MR. TANKERSLEY:** No, and I'm glad to discuss
15 at any length, Mark, in respect for the
16 meeting time maybe we ought to do this later.
17 I'm a little bit out-of-pocket and I don't
18 have those in front of me.

19 **MR. GRIFFON:** Maybe if it would be okay,
20 I've got a few of these details, maybe I can
21 contact you directly early next week. If we
22 put these to bed in my mind, I don't want to
23 waste a lot of time on the call with details
24 that we can't really take to ground.

25 **MR. TANKERSLEY:** Can I suggest this?

1 **MR. GRIFFON:** Uh-huh.

2 **MR. TANKERSLEY:** I'm glad to talk to you by
3 phone, but why don't you send me the initial
4 questions and you know, maybe data by e-mail
5 and that way I can be preparing for the call.

6 **MR. GRIFFON:** Okay. I'll do that. Yeah,
7 I'll do that. That sounds good. And I had --
8 like I said, a similar issue on another
9 document with the bioassay averages. And
10 again, it may be just the way that I'm either
11 misinterpreting or miscalculating. And it may
12 be just a matter of not having the details
13 because it references a health physics report,
14 which I don't have; so I wasn't sure if I was
15 comparing apples to apples. You know what I
16 mean?

17 **MR. TANKERSLEY:** Sure. Let me mention two
18 or three quick things. As I said, I would
19 always include all of the data, would not
20 disregard any zeros in the database.
21 Secondly, I would not translate the zeros into
22 an MDL. Thirdly, Mark, it was a little bit
23 squirrely there sometimes knowing exactly the
24 quarter or the time period to which they were
25 referring, because typically the report would

1 be a month or three months or sometimes six
2 months after the time that they were reporting

3 --

4 **MR. GRIFFON:** Right.

5 **MR. TANKERSLEY:** -- really careful that
6 you're looking at the period of time.

7 **MR. GRIFFON:** And that is what I want to be
8 clear on, too, that I'm comparing the right
9 time period, you know. So I'll e-mail you
10 those specifics and you can correct me where I
11 went wrong or whatever.

12 **DR. MAKHIJANI:** Mark, would you copy me
13 because I'm tracking that data?

14 **MR. GRIFFON:** Yes, I will. I'll copy Arjun.

15 **MS. MUNN:** Please copy me also, Mark, even
16 though I won't be a part of the discussion,
17 I'd like to know -- I'd like to better
18 understand exactly what your points are.

19 **MR. GRIFFON:** Just making notes here. Then
20 the other -- sticking with the data validation
21 question, the other follow up I had was from
22 the 5-18 -- material provided on 5-18 again.

23 **COWORKER MODEL**

24 And this may actually go over into the
25 coworker model a little bit. But the -- one

1 of the documents provided in that meeting was
2 a report listing two-and-a-half pages of
3 individuals and their cumulative exposures
4 from, I think, '52 through '56.

5 And then NIOSH/ORAU -- I believe this
6 is probably Bill that did this analysis,
7 tracked this against the database and looked
8 at the sum of the S millirem versus the
9 calculated value in the database, and plotted
10 -- I think plotted out. There were some
11 differences, but plotted those out. I cross-
12 checked maybe a handful of those and I came up
13 with the exact values this time that Bill
14 reported in all cases.

15 The thing that I noticed though was
16 that -- and this, I think, was consistent with
17 what George had said in the last meeting, was
18 that for all these -- at least for the dozen
19 or so that I looked at, they had no
20 penetrating, no P millirem and no gamma dose
21 data prior to 1956. They all had data in '56.
22 And so that raised the question to me -- and
23 the people that had data in '56, their annual
24 doses ranged from maybe 500 millirem to 1500
25 millirem, which is not astounding, but

1 generally speaking it was higher than that on
2 some of the graphs provided.

3 So my question was since these people
4 clearly were not monitored for penetrating --
5 or maybe it's rolled into one value. I guess
6 that's the question that George was saying was
7 that for compliance purposes they would only
8 report the S millirem value. But the question
9 is '52 to '55 or even earlier than '52 is the
10 coworker model still well in excess of the
11 actual values or at least comparable to the
12 actual exposures in those years? And I guess
13 that's what I was having a little more trouble
14 defending given that none of these people were
15 -- had penetrating millirem doses in the
16 database or gamma doses in the database. And
17 maybe Jim wants to reply to that or --

18 **DR. NETON:** Yeah, I guess I don't -- I can't
19 find the document you're talking -- I know
20 exactly which one you're talking about. I
21 can't find it in my pile here, but we're not -
22 - I don't think we're saying -- are you saying
23 that no one had penetrating doses in up to and
24 before 1956?

25 **MR. GRIFFON:** No, I'm saying no one on this

1 list and these are, I think, foundry workers.

2 **DR. NETON:** Right. Those are cumulative
3 exposures in that document, and they were --
4 but see, I think in that early period that --
5 remember, we talked about they didn't
6 differentiate between deep and shallow.

7 **MR. GRIFFON:** Right, so I think that's the
8 case that you have -- it's kind of rolled into
9 one, right? You said they wouldn't have it in
10 the database because --

11 **DR. NETON:** But, see, remember we talked
12 about the fact that they went to great lengths
13 after '55 when they changed -- I think it was
14 '55 -- when they changed the limits to try to
15 make the electronic database right. And
16 that's what you see in some of those documents
17 we handed out. Remember, you said, do this
18 and record this here. And in a lot of senses
19 the electronic database, which is what we
20 indicated early on, which is closer to the
21 dose of record than the original reports that
22 you're reading.

23 There's been a fair amount of -- I
24 would hate to say manipulation, but movement
25 of those data based on the reporting

1 requirements. I don't know that you see that.
2 We have a fair amount of penetrating doses, I
3 think, after '52, if I'm not mistaken.

4 **MR. GRIFFON:** Yeah, there is a fair amount.
5 It seems --

6 **DR. NETON:** The question really is is the
7 amount of penetrating we have in '52
8 reflective of the average or maximally-exposed
9 workers? I mean, we have a fair amount of
10 data so, you know, I think we acknowledge it -
11 -

12 **MR. GRIFFON:** You're saying for these
13 foundry workers the push was compliance and
14 their -- clearly their biggest exposure of
15 concern would have been the beta exposures,
16 right?

17 **DR. NETON:** Exactly, because that would
18 deliver --

19 **MR. GRIFFON:** So therefore they didn't
20 record both on those workers.

21 **DR. NETON:** Right. That's reflected in one
22 of those memos that we handed out at the last
23 meeting, but --

24 **MR. GRIFFON:** I mean, all I was looking at
25 is this graph that's figure 1 in one of the --

1 and you can't find the document. But it's
2 figure 1 in your -- well, all this was rolled
3 together in one of your handouts that you gave
4 us.

5 **DR. NETON:** Right.

6 **MR. GRIFFON:** But this is the validation of
7 backward extrapolation model for estimating
8 doses on unmonitored workers by George Kerr.

9 **DR. NETON:** Yeah, I don't remember exactly.

10 **MR. GRIFFON:** And the figure 1 shows the
11 annual gamma ray doses in millirem versus the
12 backward extrapolation model. And clearly and
13 before '57 there's a big gap. It starts --
14 the coworker model starts to be far in excess
15 of the mean from the CER database, and it is
16 the mean; I should say that.

17 **DR. NETON:** Right.

18 **MR. GRIFFON:** But I'm looking at these mean
19 values and they're in the range of 3 to 400
20 millirem. And it struck me that these foundry
21 workers were -- even for '56 were from 500 to
22 1500. Now they could be at the high end of
23 the exposed population, but then I said to
24 myself, well then, why weren't they monitored.
25 But you're saying for compliance purposes they

1 were monitored. They were just recorded in
2 the beta, right?

3 **DR. NETON:** Right.

4 **MR. GRIFFON:** Okay. But I mean the question
5 then remains, you know, as long as we still
6 believe this coworker model bounds even this
7 sort of situation where the foundry workers
8 seem to have had -- even their penetrating
9 doses would have been higher than these means
10 that are on your graph.

11 **DR. NETON:** Right, if you recall starting in
12 '53 -- this was sort of one of my comments on
13 the draft that came through yesterday --
14 starting in '53, it was their practice to
15 record things at the detection limit that were
16 not measurable. So you end up with this sort
17 of -- as George Kerr said several times -- a
18 bimodal distribution where there's a lot of
19 zeros. There's a lot of 400 millirem
20 exposures that are recorded that really are
21 just a result of the using the LOD. In doing
22 that you end up with essentially missed dose
23 being recorded, but when you're looking at
24 these triangles, I'm saying that those
25 triangles by and large represent a lot of

1 missed dose.

2 **MR. GRIFFON:** Okay.

3 **DR. MAKHIJANI:** Just a procedural question,
4 Mark. Are we now discussing issue seven, the
5 coworker model?

6 **MR. GRIFFON:** I guess we're into the
7 coworker model, yeah. This overlapped a
8 little bit because I was looking at validating
9 those data and it kind of leads into the
10 coworker model, yeah, yeah.

11 **DR. MAKHIJANI:** I did see Jim's comment and
12 John and I talked about maybe John this is an
13 appropriate time to -- John?

14 **DR. MAURO:** I'm sorry. I had you on mute
15 because I had a guy in the background doing
16 some lawn work, very noisy, so I put you on
17 mute.

18 Yes, can everyone hear me okay now?

19 **MS. MUNN:** Yes.

20 **DR. MAURO:** We've been working on putting
21 together this revised report where we give a
22 status report, and as you know we are still a
23 bit struggling with the coworker model. But I
24 think as everyone knows, we also are inclined
25 to believe that it's not an SEC issue. And

1 Jim did provide some information to us in
2 commenting on one particular aspect of this
3 issue, and I'd like to air it out a little
4 bit.

5 I'm thinking about this issue in a
6 little bit different way than everyone has
7 been discussing it and the kinds of data that
8 George has been providing. And I know we've
9 been zeroing in heavily on the 147 workers and
10 the extrapolation method and comparing the
11 extrapolation to earlier data. And I'm
12 looking at this -- I think we've been -- I
13 think SC&A and NIOSH have been looking at this
14 in a way that has resulted in a lot of
15 confusion and miscommunication.

16 **DR. MAKHIJANI:** This is the pre-'56 period
17 you're talking about?

18 **DR. MAURO:** Yes, let me make myself clear.
19 We are convinced that the dataset from 1956
20 forward, all of the validation work is solid,
21 and it sounds like you've even added more of
22 the data validation. So you're standing on a
23 really solid ground with the dataset '56
24 forward as your basis for building a coworker
25 model.

1 And what we've been debating and
2 discussing is the algorithm and how the
3 extrapolations are being used, and as we all
4 know it's a sophisticated model. And we've
5 been trying to work within that framework to
6 convince ourselves that using that model to
7 reconstruct doses to workers in the early '50s
8 is, in fact, scientifically valid and claimant
9 favorable.

10 One of the original flies in the
11 ointment was that, well, we know that there
12 were lots of problems with the data in those
13 early years. And one of our concerns, and
14 this is sort of like how the story unfolds,
15 was that, well, okay, during these early years
16 we're getting a lot of contradictory
17 information in 1950, '51. There was -- all of
18 this business about the zero, you know,
19 everyone was recording zeros and then they
20 were recording lower limits of detection. And
21 then they were recording things in the skin
22 dose in the S but not the T. All of which
23 left us in the situation where the concern
24 was, well -- originally was, well, to what
25 extent was that practice and the problems

1 there somehow influencing adversely the
2 validity of the post-'56 database, and I think
3 that issue has gone to bed. That was
4 important because it meant that any -- the
5 problems that were experienced in the early
6 years are not in any way reflective of a
7 continuation of those problems in the later
8 years.

9 So now we have a very nice clean
10 break, which means that, okay, we really can't
11 do too much with the early year data. So we
12 understand now the rationale why you need an
13 extrapolation model. And so then the question
14 becomes, okay, we've got an extrapolation
15 model. Right now our ability to convince
16 ourselves that the extrapolation model will
17 serve the process well is still somewhat in
18 question, okay, and we're still looking at
19 that.

20 So I stepped back and asked myself a
21 different question. I say, well, hold the
22 presses. What do we have here? We've got
23 about 2500 workers, only a very small fraction
24 -- this is now the early years now -- only a
25 small fraction of which were monitored. And

1 the monitored data that you look at you're
2 going to see a whole bunch of zeros in 1950
3 and '51.

4 And then starting in 1952, you're
5 going to see a whole bunch of doses recorded
6 at around 400, I believe, millirem per quarter
7 because everyone was assigned the LOD. But
8 then you will have a number of measurements
9 that were relatively high, including that were
10 on the high end of the distributions which
11 were measurements that -- and it sounds to me
12 that there might be a little bit of confusion
13 as to whether those high readings are
14 penetrating or skin in some cases. In other
15 cases it's clear. We know what they were.

16 So you have this array of early data
17 and the question now becomes, okay, given that
18 we have all of this information that's solid
19 from '56 forward, and let's say we want to
20 build a coworker model. Now, you folks have
21 gone ahead and built a coworker model, and I
22 know you're very comfortable with it, and
23 you've made many arguments that show how well
24 it serves us.

25 The way I look at it is, well, do I

1 believe given all of the data that we have in
2 front of us that a coworker model can be
3 built, and that using the early data we can
4 actually use the coworker model to convince
5 ourselves that when you use the coworker
6 model, whatever form it takes, we will be able
7 to develop an extrapolation methodology that
8 will be able to be used.

9 And when we're done we can convince
10 ourselves by looking at the available early
11 data that, in fact, by and large the
12 extrapolation model will place us in a place
13 where we're comfortable that we're giving the
14 benefit of the doubt to the vast majority of
15 the workers that were working in the earlier
16 years. Certainly, the vast majority of those
17 2500 workers that were working in the early
18 years were probably going to be assigning
19 doses that were well above exposures that they
20 may have experienced.

21 So and then we will also probably find
22 that the extrapolation model, there were for
23 those workers where we have some high-end
24 numbers, that the extrapolation model may have
25 been coming in a little low. There may be

1 real measurements made back in the early years
2 where the extrapolation model was coming in
3 below that value for some real measurements.

4 Now, I have to say that when I step
5 back and look at that picture I feel as if it
6 is possible to build a scientifically sound
7 coworker model that can be verified with the
8 available data for the early years and
9 demonstrate that by and large we're going to
10 be predicting doses that the vast majority of
11 the workers are, in fact, conservative, and in
12 some cases very conservative.

13 But there may very well be a handful
14 of workers where -- that are going to be
15 difficult to identify that may have gotten --
16 experienced exposures that were, in fact,
17 somewhat higher, but perhaps not very much
18 higher than what is developed by a coworker
19 model whatever that model is; even whether you
20 use extrapolation using the full distribution
21 with the adjustment factors or you extrapolate
22 going with the 95th percentile.

23 But where I walk away from is a sense
24 that you have a functional coworker model can
25 be developed even though there might be

1 certain individuals that cannot be identified
2 at this time that could theoretically have
3 gotten higher exposures than what the --
4 whatever the coworker model is might have
5 predicted. The question becomes is that good
6 enough in terms of a coworker model?

7 In my mind it is. In my mind that tool that
8 would be developed will always have certain
9 limitations. And it's not going to guarantee
10 that each and every person will be, you know -
11 - that there's a guarantee that there's no one
12 that could have gotten a dose greater than
13 what the extrapolation model predicts. And in
14 my mind you can't place that demand on any
15 coworker model; that it will serve us
16 perfectly for every single individual.

17 So I walk away from this accepting
18 that as meeting the intent of the rule and
19 what the coworker model should try to
20 accomplish for us. So right now where I'm
21 coming out of this is that though I am
22 troubled with the 147 people -- the model that
23 has been developed -- the specific model that
24 you're using. I am not troubled with the fact
25 that I believe a -- if I -- that a coworker

1 model can, in fact, be developed that would be
2 claimant favorable and meet what I would
3 consider to be the intent of the rule. And so
4 that's how I'm sitting and looking at this
5 right now. And Arjun and I, of course, we
6 have been struggling with this together for
7 quite some time.

8 Arjun, I'd like to give you an
9 opportunity for you to communicate your
10 sensibilities regarding the -- what I would
11 call the plausibility of building a coworker
12 model that is both scientifically sound and
13 claimant favorable for those workers in the
14 early years where we really have questionable
15 data and very, very limited data.

16 **DR. MAKHIJANI:** Yeah, let me first just more
17 simply address the later '56 to '60 period,
18 and we've done some more analysis on that.
19 And that analysis indicates that a coworker
20 model can be built, but the one that was built
21 doesn't appear to be claimant favorable for
22 the workers that were at higher risk in the
23 departments with the higher mean doses or the
24 highest mean doses for the unmonitored workers
25 there. But there's no -- there doesn't appear

1 to be any question now of residual after the
2 analysis that we did and the departmental data
3 that NIOSH provided that a good model can be
4 built for those years if you take into account
5 the departmental data properly. So we've
6 concluded that for the '56 to '60 period that
7 there's not an SEC issue there even though we
8 don't agree with the model that is being used.
9 But for the later period basically the way
10 John and I were discussing this is that --

11 **MR. GRIFFON:** You mean for the earlier
12 period, Arjun?

13 **DR. MAKHIJANI:** The earlier period, '48 to
14 '55. We've had these problems with data
15 validation and so this is in a way part of our
16 hesitation has been this is kind of precedent
17 setting and that we've found some systemic
18 problems with the data. At the same time
19 there are no problems with the idea that there
20 were film badges, and the film badge readings
21 are not in question that the -- you know, that
22 there was something wrong with the badges or,
23 you know, the badges were deteriorated or you
24 can't interpret.

25 The question of interpreting the

1 measurements were they shallow or were they
2 penetrating and so on, and NIOSH has provided
3 quite a bit of information about that.

4 The big question is how do you
5 interpret the higher doses, which could be
6 quite high given that the beta doses were
7 quite high. And then how do you construct a
8 model that will properly envelope those for
9 groups of workers that were at high risk?

10 In terms of -- at least in terms of
11 external exposures, it's going to be hard to
12 define what those external exposures were
13 unless you go to some theoretical
14 considerations like what's the maximum
15 possible exposure that could have occurred
16 with uranium and so on.

17 So it's probably possible to do a
18 bounding analysis, but it will require
19 considerable data interpretation as John was
20 indicating, and the earlier period will be
21 more difficult. It seems that in principle
22 you could do it, but it will be a much more
23 difficult job because the data validation
24 question is an important question and will be
25 precedent setting.

1 **MR. GRIFFON:** Well, I guess let me say where
2 I stand on this, which is that I think in the
3 back of my mind I keep -- I sort of have this
4 notion that, well, worst case I think you can
5 do sort of a source term, you know, the slab
6 source kind of scenario and give an upper
7 bound on anyone. And then so then I've sort
8 of been going down from there, you know, can
9 we get the -- and what I get, in general, I
10 can give specifics on this.

11 I mean, instead of speaking in
12 generalities, I did do 11 of those foundry
13 workers and I pretty much selected them. They
14 weren't the highest exposed on the beta side.
15 They were just part of that listing that you
16 guys provided in that report. And looking at
17 those 11 the average of those 11 is like 650
18 per year, and as I said before a lot of them
19 only had two or three quarters of monitoring
20 so it wasn't even a full year.

21 And compared to your coworker model
22 that average was slightly above, and one
23 individual was as high as 1450 for the year
24 which is well above that coworker curve. So
25 this group -- and then you have nothing for

1 them prior to '56 going back to '52 as far as
2 penetrating so I think that is an important
3 consideration.

4 Having said that -- so I've got some
5 concerns whether this coworker back
6 extrapolation model is going to bound some of
7 those people, but having said that I think we
8 could get an upper, upper bound just by using
9 some sort of a source-term scenario. And
10 therefore, I don't think this falls into an
11 SEC category. That's the bottom line on that
12 for me. I don't know how other -- if other
13 people want to weigh in or if Jim wants to
14 respond to any of that.

15 **DR. NETON:** Yeah, I'd like to say a couple
16 things I guess. I'm encouraged to hear that
17 at least people believe that given the 2000
18 measurements that something -- some sense can
19 be made of them because I do believe that
20 we've gone a long way, as Arjun indicated,
21 towards explaining -- or at least
22 understanding the issues with the data.

23 Yes, there are discrepancies, but
24 we've identified a lot of source documents
25 indicate why they exist the way they do.

1 Given that I think that we can definitely
2 demonstrate that we've got some sort of
3 bounding analysis understanding what was done.

4 For example, when they were assigning
5 missed dose to workers, we could use that. I
6 mean, missed dose -- we do this all the time
7 is assigning missed dose to people based on
8 the monitoring program's technical shortfalls
9 and stuff.

10 So if we know in '53, for instance,
11 '54 that there are missed dose calculations, I
12 think we could do that. The rub, I think, is
13 in '51, '52, but even then we know if they're
14 zeros we could assign missed dose based on the
15 monitoring status. So I'm fairly comfortable
16 with the fact that we can do this.

17 I still believe in my heart that the
18 extrapolation model is -- does provide
19 bounding considering that we are overarching
20 on top of a missed dose calculation to begin
21 with. But I do agree that we have not
22 essentially proven that to any large extent.

23 **DR. MAURO:** Jim, in a way I guess it becomes
24 a simple -- I look at it like this. There are
25 probably some departments that we can identify

1 right now and workers in those departments
2 that were working in 1949, 1950, 1951 that
3 were the departments that we all know probably
4 the ones that had the highest exposures. And,
5 in fact, you probably have data for a number
6 of the workers in those departments, but it
7 would only be a small fraction of the workers
8 that were in those departments, okay.

9 Then we're in a situation where, okay,
10 we want to predict the doses to all those
11 workers that are in those departments where
12 they did not monitor them, where we don't have
13 those zeros or we don't have a real value, and
14 we're going to use your extrapolation method.
15 And the extrapolation method will bring you to
16 a place where you say, okay, for this person
17 who worked in this department we come up with
18 this dose using the extrapolation model.

19 But our concern is that, well, right
20 now we are in this uncomfortable position that
21 -- see, we know that department probably got
22 hit the hardest and that for this person who
23 was unmonitored, and we don't have any data
24 for at any time, perhaps not until -- he may
25 have only worked a few years. We may have no

1 data for him at all, but we want to predict
2 what his dose is in that year.

3 And it seems to me that using the
4 extrapolation model that you have will put you
5 in a place where there's a reasonable
6 likelihood at least for the people in that
7 department you may not be giving the benefit
8 of the doubt because your extrapolation model
9 includes data from all departments in its
10 construct and so may not really be -- and it
11 certainly would be applicable when you look at
12 the aggregate for all departments. But when
13 you look at the people in that department, we
14 may not be doing -- giving them as much of the
15 benefit of the doubt as we should.

16 But I'm not troubled by that because I
17 believe that when you are in the circumstance,
18 you don't have to use the full distribution or
19 the methodologies you provided. There are
20 probably other ways in which of doing the
21 extrapolation for people in that department
22 that would give a stronger sense that we're
23 being fair-minded for those individuals.

24 For other departments the method that
25 you propose where you come out with a method

1 where we have plenty of evidence that, gee,
2 people in those department for the place where
3 we do have data both pre-'56 and post-'56
4 there's plenty of evidence that the exposures
5 there were relatively low. And so it's those
6 departments that we know were the ones at
7 where the exposures may have occurred where we
8 feel that the current method that's being
9 proposed may not be claimant favorable.

10 But there are ways in which
11 extrapolations can be done that not only are
12 claimant favorable but can be shown to be
13 claimant favorable by comparing the
14 extrapolations to the actual data that we do
15 have, very limited data that we do have for
16 those departments.

17 So on that commonsense approach that I
18 -- and I'm not even talking about the 147
19 measurements or the extrapolation model that's
20 used and the sophisticated statistical
21 treatment that has been developed. I'm just
22 talking about it simply from a commonsense
23 argument. There doesn't seem to be any reason
24 why we cannot place plausible upper bounds on
25 those people who worked in those departments

1 during the early years that probably
2 experienced higher exposures than most of the
3 workers -- of those 2500 workers that were
4 working in that facility at that time.

5 So on that basis I'm prepared to say
6 that I think that an extrapolation coworker
7 model can be developed that will be fair-
8 minded for those workers. Now, even though we
9 are at disagreement regarding your particular
10 coworker model, I feel confident that there is
11 a coworker model that can be developed that
12 can deal with the concerns that I just
13 described.

14 **DR. NETON:** Well, I'm glad to hear that. I
15 would point out that this model that we have
16 in front of us was developed with the idea
17 that the highest exposed workers were
18 monitored; and therefore, this represents the
19 50 percentile back extrapolation. We can
20 certainly make accommodations for other, you
21 know, for those foundry workers or whatever
22 that really --

23 **MR. GRIFFON:** I think that's what we're
24 saying.

25 **DR. MAURO:** That's all we're saying.

1 **DR. NETON:** And that's not inconsistent with
2 what we've got elsewhere where you have a
3 worker who wasn't monitored that we believe
4 should have been, we provide him a higher
5 exposure, like the 95th percentile, versus a
6 worker who didn't need to be monitored and
7 wasn't, and maybe this is appropriate for
8 that. I don't know, but --

9 **DR. MAURO:** You just said it a lot more
10 briefly than I did. That's exactly what I'm
11 talking about.

12 **MR. GRIFFON:** That was my only point of
13 doing the calculation, Jim, was instead of
14 speaking in the theoretical or hypothetical,
15 you know, there could be a department out
16 there that has higher. I think this a
17 department that does have higher than the
18 average coworker model so I think those, you
19 know -- but having said that I think the
20 bottom line is I think there are ways that you
21 can get to a maximum plausible for all
22 workers, and that's part of my question for
23 the SEC.

24 Is everybody in agreement on that
25 final point?

1 **DR. MAURO:** I am.

2 **MR. GRIFFON:** If that's the case, then we
3 can --

4 **DR. MAURO:** Arjun, I'd like to hear --

5 **DR. MAKHIJANI:** I think so. I think the
6 words have to be carefully chosen in regard to
7 the earlier period, but yeah, I'm in agreement
8 in principle. I haven't -- I just had a long
9 conversation with John about this this morning
10 and I haven't had time to think about it. But
11 yeah, I think I'm with the rest on the same
12 page.

13 **MR. TANKERSLEY:** This is Bill Tankersley.
14 I'd like to respond to just a couple things,
15 please. First of all, we believe that the
16 regression model that we developed is fair-
17 minded and we think it is claimant favorable,
18 and not only that, we have demonstrated that.
19 I think it would be only fair -- or say the
20 SC&A team to generate some doses using the
21 model that would show that it is not Claimant
22 favorable.

23 But the second comment is --

24 **MR. GRIFFON:** Well, Bill, can I stop at that
25 one? Didn't -- these foundry workers, I can

1 give you the numbers and the case number, and
2 I'd like you to compare that to -- because
3 they have data for '56, but they would need
4 coworker data '52 through '55. And I can
5 demonstrate in '56 that it is above the
6 coworker model.

7 **MR. TANKERSLEY:** Okay. Mark, keep in mind
8 that this is a gamma regression model and the
9 numbers that you're talking about I'm
10 thinking, you know, might --

11 **MR. GRIFFON:** No, I'm talking gamma.

12 **DR. NETON:** Mark, I don't want to throw a
13 fly in the ointment because I think we're kind
14 of coming to agreement here, but if you have
15 data after '56, the coworker model allows for
16 -- remember those scaling factors.

17 **MR. GRIFFON:** Correct.

18 **DR. NETON:** In other words if your value was
19 x in '56, you scale it upwards --

20 **MR. GRIFFON:** So they (inaudible) with the
21 model. They may account for it. You're
22 right.

23 **DR. NETON:** That may account for that
24 difference.

25 **DR. MAKHIJANI:** But it doesn't solve your

1 problem for before '56 because the same worker
2 in '55 who did the same thing and therefore
3 would have gotten the --

4 **MR. GRIFFON:** No, but it would allow you to
5 scale it based on the real data.

6 **DR. MAKHIJANI:** I don't think scaling
7 factors are proposed for before '56.

8 **DR. NETON:** Yes, yes, they are.

9 **MR. GRIFFON:** They are.

10 **DR. MAKHIJANI:** Oh, they are for the whole
11 period?

12 **DR. NETON:** Yeah, we have been talking in
13 the construct that there's zero monitoring
14 data for people in this class, but the model
15 itself does say if you have data after '56,
16 you take your values and scale them.
17 Essentially, you draw parallel lines to that
18 back extrapolation model and just use the same
19 slope.

20 **MR. GRIFFON:** Thank you for that reminder,
21 and I -- that's a real case anyway that might
22 be worth --

23 **DR. NETON:** I really don't want to spend --
24 maybe so we can come to, we agree, I think,
25 that --

1 **MR. GRIFFON:** We agree, yeah.

2 **DR. MAURO:** We agree. I think that half of
3 the problem, Jim, and I have to admit, is
4 probably we don't really appreciate the power
5 of the model, and may very well get into that
6 during the site profile part. But I really
7 would like to propose that from an SEC point
8 of view, you know, I think that we are in
9 agreement that a coworker model either has
10 been or can be developed that will meet the
11 intent of the rule and reserve, I guess, for
12 some future debate, you know, maybe we need to
13 learn a little bit more about the power of the
14 model and that, in fact, it will serve us
15 well.

16 **MR. GRIFFON:** Let me -- since I cut Bill
17 off. I apologize, and it's a good reminder,
18 Jim, to me about the scaling factor and that
19 could well account for the foundry worker
20 difference there. And, Bill, you were making
21 a second point there. I apologize for cutting
22 you off.

23 **MR. TANKERSLEY:** That's okay, just one quick
24 thing.

25 A number of times they've used about

1 exposures in a department, departmental
2 exposures. I think it's really, really
3 obvious that the departments were not the
4 basis upon which exposures were based. Keep
5 in mind we're talking about three to five
6 thousand people most every year during those
7 earlier years and throughout the history.

8 But only really a small number of the
9 population were judged to be at risk, and I
10 think, you know, subsequently shown to have
11 significant exposures. So it's really not
12 applicable or not logical to talk about
13 departmental exposures.

14 We really believe and I think the
15 documents show that persons were judged to
16 have certain exposures, not departments. Even
17 in those departments, Mark, that you looked
18 at, that's only a small fraction of the people
19 who are in those departments, the people who
20 were monitored. So we need to think about
21 individuals rather than departments.

22 **MR. GRIFFON:** Good point, and that
23 reinforces my earlier concern about finding
24 the right people for the thorium work, but
25 that's a good point. It's not departments;

1 it's individuals, right.

2 Is there anything -- I think we've
3 hashed over that coworker model pretty well,
4 and the bottom line, which I think is the most
5 important, is that none of us here now think
6 that it's an SEC issue; is that correct?

7 **DR. MAURO:** Yes, I don't know about anyone
8 else.

9 **MR. GRIFFON:** I'm sure Jim's in agreement
10 with that.

11 **DR. NETON:** Yes, I am.

12 **MS. MUNN:** I certainly hope so, but I also
13 certainly hope that we're not going to have
14 this kind of -- this depth and breadth of
15 concern about this issue when we get back to
16 site profile discussions.

17 My ears really perked up when I heard
18 someone say, yes/but because we hear so many
19 yes/buts. Are we really agreeing to anything
20 here in this discussion? Or are we just
21 saying, no, we're going to postpone this
22 because it really is not -- I hope that's not
23 what we're saying.

24 **MR. GRIFFON:** I don't think we're simply
25 postponing it. I think we all agree. I think

1 that we just have to, you know, the question
2 is are -- is this -- I guess there's some
3 nuances of the model that it could be maybe
4 more -- looked at a little more, but I think
5 we've analyzed this up and down and around.

6 And maybe just the way in which it's
7 going to be applied can be considered by SC&A
8 and explained by NIOSH a little better. And
9 whether in certain circumstances -- and I must
10 admit I forgot about that adjustment factor
11 and when it was used and when it was not used,
12 but that's probably an important consideration
13 in this thing and that may let all discussions
14 go away, or NIOSH may say for certain workers
15 we're going to apply the 95th rather than the
16 full distribution, and so I think it's more
17 application now, down to the application which
18 gets into the individual dose reconstruction
19 part of it.

20 So I don't think -- I don't think
21 we're just pushing it down the road, Wanda, I
22 hope not. I don't want to retread over all
23 this ground again either.

24 **MS. MUNN:** Yeah, I hope not, too. From the
25 point of view of an individual who does not do

1 dose reconstructions on a regular basis, and
2 as a matter of fact hasn't done one for years,
3 frankly, what our whole discussion sounds like
4 is the kind of discussion that has gone on in
5 health physics circles for years and years
6 especially in communications with the public
7 where the charge comes back at you.

8 You can't say whether this exposure
9 did or did not cause this disease simply
10 because you cannot say whether this neutron
11 struck this particular cell or not or whether
12 this penetrating dose penetrated something
13 that you aren't taking into consideration.

14 **MR. GRIFFON:** That's a little different
15 topic, but --

16 **MS. MUNN:** Well, it is a different topic,
17 but it's the same kind of argument. If you
18 can't prove this, then you can't make any
19 assertions with respect to the reasonable
20 accuracy of what you're doing. And it's,
21 again, from the point of view of a person who
22 does not do this all of the time, the fact
23 that this model looks to be as reasonable as
24 you can get seems to me to fit the requirement
25 of the pool.

1 And I hope that we can -- I hope what
2 I'm hearing as agreement here is going to be
3 the same kind of agreement that we come to if
4 we have to revisit this in site profile.

5 **MR. GRIFFON:** I have to agree. I think
6 we've made excellent headway on this. I do.
7 It won't be days and days of discussion on the
8 site profile review. If I'm still chairing
9 that session I won't let that happen. We
10 can't do that, you know, to that extent.

11 **DR. MAURO:** This is John Mauro. I'd like to
12 say one more thing, and I think it's
13 important. Because what we have just done is
14 we have been confronted with what I consider
15 to be some of the most challenging issues.
16 We're talking about thousands of workers who
17 worked from 1948 up to, I guess, 1955 or maybe
18 up to even '60. Thousands of workers that
19 were not monitored, and in many cases prior to
20 '55, I guess, the data that's out there is
21 highly questionable and how to use it.

22 So we are dealing with what I would
23 consider to be perhaps one of the most
24 important cases and issues that this program
25 is going to be tested by. In other words, can

1 you somehow reconstruct the doses to thousands
2 of workers who worked during the early years
3 where we have very little data and the little
4 data we have in terms of the percentage of
5 workers that were monitored does have some
6 internal inconsistencies that leave us a
7 little uncomfortable.

8 So in my mind this particular issue is
9 as powerful and difficult an issue to engage
10 and that we've seen to date. And I think that
11 we've come through -- after a lot of struggle,
12 though we have not come to complete resolution
13 on the best way to do it, I think that the
14 fact that we've come to the place where we all
15 agree that it can be done is a very important
16 milestone. That you can bring to ground and
17 you can reconstruct doses for very large
18 numbers of people in the very early years of
19 the program even though there was very limited
20 data for those individuals at that time.

21 So I mean I guess I know it's painful.
22 It has been painful, and it may still be
23 painful in the future when we move forward,
24 but I also think that this is about as big an
25 issue as we're going to have to deal with.

1 **MS. MUNN:** I think that's probably true,
2 John, and I appreciate every word you've said.
3 The thing that bothers me is the large
4 picture. And the large picture tells me that
5 you speak of these thousands and thousands of
6 workers, but the truth is I do believe that
7 everyone on this call recognizes that the vast
8 majority of those workers were not harmed by
9 the work they did or by the exposure that they
10 had.

11 And the work we do here and the
12 conclusions that we come to leave a great many
13 people, including people who are going to
14 influence the future of this country, to
15 believe that more harm was done than was. And
16 in our efforts to be fair to the worker we
17 continue to mislead the public and many of the
18 workers themselves in my view.

19 I think that's as large a concern and
20 one that we lose track of when we take the
21 positions that we've taken with respect to the
22 validity of the data and with respect to
23 whether or not the information that we have
24 can be used to adequately cover the question,
25 were you harmed.

1 Because that's the bottom line
2 question; were you harmed? And we all know
3 that there is no -- there is no data that
4 shows us that excess numbers of folks were
5 harmed. We all know someone was, but for how
6 far we go with that is, I think, not just
7 important in this arena that we're working in
8 now. It's important in a much, much larger
9 arena.

10 So for us to lose track of the fact
11 that the vast majority of workers were not
12 harmed by this work is, I think, perhaps
13 failure to meet our responsibilities to the
14 larger technology and science that we serve.

15 **MR. GRIFFON:** I think you're on a broader
16 topic than the work group is here today, but I
17 appreciate that. And I mean -- the only thing
18 I would say is I don't disagree that -- I
19 think part of it is how this program
20 communicates to the public, too, because
21 clearly NIOSH is using overestimating
22 techniques and things like that.

23 And I think that the public sometimes
24 interprets what they get out of their dose and
25 clearly it was of that overestimate of their

1 dose. So I think some of that, you know, I
2 think we have to improve on how we communicate
3 the doses, and therefore, potentially in
4 people's minds, the risk, you know, that was
5 involved in past operations. But the other
6 think I'll say is that I'm going to go where
7 the data takes us, and I think sometimes we
8 find that some of the devils are in the
9 details.

10 I'm not going to stop at, you know,
11 this whole question of overall this population
12 at this given place probably got very little
13 exposure. There's two sides of it. One, I
14 think sometimes when we start making these
15 claimant favorable assumptions, we push people
16 that likely had little or no exposure way up.
17 But if we use coworker models that are average
18 coworker models then we potentially bring some
19 of the highest exposed people back down, you
20 know.

21 So I guess we're looking on both ends
22 of that and we're all considering that. But I
23 think part of what we do is we have to go
24 where the data takes us, too. So if you don't
25 have the data to prove something that you

1 salvage workers that were working in the later
2 years when there was uranium urinalysis data.
3 And, in fact, they've now provided nine IDs.
4 I just got those. And my question was looking
5 at the ACCESS database, only one of those
6 individuals has a job title that suggests
7 salvage work. But I think it's clear that
8 there's nine IDs that were provided. All were
9 still being monitored for uranium in 1952.

10 So even though I can't show that there
11 were salvage workers earlier on, Bill
12 Tankersley has looked at that database from
13 the earlier time period and has found job
14 titles consistent with salvage work, which he
15 forwarded to me and others I presume.

16 **MR. TANKERSLEY:** I'll go ahead and respond
17 to that, please. Those nine people did have
18 salvage-related job titles during the pre-1950
19 time period, and they also -- analysis in the
20 later period.

21 You said that only one had a salvage-
22 related job title?

23 **MR. GRIFFON:** After 1950, yes, that's
24 correct.

25 **MR. TANKERSLEY:** After 1950.

1 salvage workers in the earlier time period,
2 and that they still have uranium data, I'm
3 satisfied that this model will work for
4 bounding their exposures given that the model
5 that Jim has explained several times the
6 approach and if SC&A has any other input into
7 that. I think I'm satisfied at this point
8 that it will work for these workers as well.

9 **DR. MAURO:** This is John Mauro. Yes, we've
10 come to the same place as you have on this,
11 and we are comfortable with the coworker
12 approach that's being proposed by NIOSH.

13 **MR. GRIFFON:** And the only other thing, and
14 I'll e-mail some of these things directly to
15 Bill maybe, but I think as a matter of the
16 record going forward it might help for others
17 that end up looking at this eventually that we
18 explain some of these things. How the
19 averages were calculated, how the -- you know,
20 a little more detail.

21 And I understand this is all done real
22 time so we've got the answers we need. But
23 I'll e-mail to Bill on that and maybe just so
24 when somebody looks back at this in the future
25 they see the rationale and see how we came to

1 the conclusion we did. So having said that I
2 think that's the end of that issue.

3 (telephone static interference)

4 **DR. MAURO:** We've got a lot of static on the
5 line. I can't hear anyone. Okay, that's it.
6 I think it cleared up.

7 **MS. MUNN:** Yeah, whatever that was.

8 **DR. MAURO:** Yeah, I'm okay. Is everyone
9 else okay now?

10 **MR. PRESLEY:** This is Bob Presley. I'm
11 listening.

12 **MS. MUNN:** We did cover this with one of the
13 dose reconstructions, didn't we? Didn't we
14 have --

15 **DR. NETON:** Are you talking about the
16 salvage worker issue, Wanda?

17 **MS. MUNN:** Uh-huh, the salvage worker issue.
18 Didn't we have --

19 **DR. NETON:** Yeah, we had a dose
20 reconstruction where we applied the coworker
21 model back to '48 and '49, but the issue arose
22 as to was there a population of salvage
23 workers that could have been more highly
24 exposed. Our model was biased low.

25 **MS. MUNN:** Right.

1 **DR. NETON:** And I think we've demonstrated
2 that we have nine people in the current
3 coworker model who were salvage workers prior
4 to 1950, and that their bioassay data using
5 our approach are bounded by the current
6 coworker model. So I think we're okay.

7 **MS. MUNN:** Mark, that the paper's on. I
8 couldn't find it. I thought we had talked
9 about this.

10 **DR. NETON:** We did the analysis. I think
11 that's what brought up this whole question is
12 that's really a valid approach and I think
13 we're okay now.

14 **MS. MUNN:** Okay.

15 **DR. MAURO:** And bear in mind that remember
16 how this all began was, well, if for some
17 reason we have some data that showed that the
18 salvage workers may very well be at the high
19 end of the distribution, we always had
20 recourse to -- or NIOSH always had recourse to
21 extrapolate using a 95th percentile
22 extrapolation. But the data that has actually
23 been revealed to us for those nine workers is
24 that, if anything, they're a little bit lower
25 than the median dose, a little lower.

1 So I mean where we are in this in my
2 mind is the method proposed by NIOSH certainly
3 seems to be appropriate, and if push comes to
4 shove, if you have to for whatever reason, the
5 dose reconstructor could certainly use a more
6 conservative extrapolation method to make sure
7 that a particular worker is given fair
8 treatment. So I think it's a tractable
9 problem.

10 **MS. MUNN:** Yeah, that was your conclusion in
11 your April letter.

12 **DR. MAURO:** Yes.

13 **MS. MUNN:** That as long as you use the 95
14 percentile that you were happy, right?

15 **DR. MAURO:** Right, if needed. If there was
16 some question regarding that. But I think
17 NIOSH wanted to give it a step further.
18 Actually following these nine workers to show
19 that reality is this, I guess, this perception
20 that salvage workers for some reason might
21 have experienced higher exposures than the
22 rest of the workers. It does not appear to be
23 the case.

24 **MS. MUNN:** Yeah, which is (inaudible).

25 **MR. GRIFFON:** I lost the call for a few

1 minutes, but I'm back on. Wanda, I apologize
2 for not framing. I thought everyone
3 remembered that description of how NIOSH was
4 going to do that, the model.

5 **MS. MUNN:** That's okay. I was losing part
6 of the conversation. I was speaking through -
7 - digging through paper.

8 **MR. GRIFFON:** Yeah, I was also trying to get
9 us through. I think we're almost to the end
10 here.

11 Is there anything else? I think we've
12 gone through all the issues that I have unless
13 there's something on data validation or
14 coworker that I missed.

15 **DR. MAURO:** The only item that we have in
16 our purview was this that came up regarding
17 this measurement with the cesium-137 and the
18 potassium --

19 **MR. GRIFFON:** Oh, yeah, the issue 13.

20 **DR. MAURO:** Yeah, that issue 13, but that
21 has been fully resolved. That is, we
22 interpreted the spectra in the urinalysis data
23 for that particular worker that emerged during
24 the Denver meeting as meaning one thing. And
25 we sent in our memo to Jim and Jim had a

1 chance to look at it. He got back to us and
2 he explained to us what was really going on
3 and corrected us.

4 We now understand exactly what that
5 person's records mean, and in fact, that NIOSH
6 did, in fact, interpret his bioassay data and
7 chest counts appropriately. So that problem's
8 gone away.

9 **MR. GRIFFON:** I thought that was resolved at
10 the last meeting. That's why I didn't include
11 it.

12 Is there anything else? Arjun, do you
13 have anything that we --

14 **DR. MAKHIJANI:** I'm going through here just
15 to see we didn't miss anything. Yes, I think
16 we've covered everything.

17 **MR. TANKERSLEY:** Mark, excuse me just a
18 moment, this is Bill. While Dr. Makhijani's
19 thinking there let me mention I think the
20 reason why it may appear that those people are
21 no longer salvage workers in 1952 -- and I'm
22 going to check, but I'm thinking that that job
23 title went away. I know that I had been told
24 a number of times that in general the chemical
25 operation, -- that is what those people were.

1 There were two job titles and then a whole
2 manner of misspellings and so forth, process
3 operator and chemical operator. And I'm
4 thinking that perhaps around 1951 or '52 that
5 that, quote, salvage-related job title -- that
6 is with that kind of text string in it -- I
7 had a little bit of an algorithm I used went
8 away, and probably those people continued to
9 do the same thing.

10 **MR. GRIFFON:** It could have went away. I
11 found the one that I'll call Salua which I
12 think meant it was S-a-l-u-a, Chemica Salua,
13 (ph) which was probably was salvage, you know,
14 salva truncated. The rest of them were -- I
15 cross-walked every ID by those last two years.
16 And I can send you that little spreadsheet
17 that I put together.

18 We can correspond offline here, but I
19 don't -- I was satisfied that they were in
20 the database and had uranium data. That was
21 the key I think. So I'm not troubled by the
22 fact that their job title changed, you know,
23 anyway.

24 **MS. MUNN:** Now, having risen earlier than
25 the rest of you today; I couldn't pass that

1 up, could I? I haven't been keeping track or
2 writing down what we've said is still
3 outstanding and what is not. What do we have
4 unresolved at this issue in your list?

5 **MR. GRIFFON:** Right. Well, I think the
6 supplements are clearly -- supplements of
7 thorium, supplements of cyclotron workers;
8 nothing outstanding on plutonium. On the data
9 validation the only thing I have requested is
10 to do an offline exchange with Bill on
11 clarification on some of the documents. But I
12 don't see any -- I think they've addressed all
13 concerns on data validation.

14 And the other action on that that I've
15 asked Jim Neton if possible any of these
16 health physics reports that are referenced in
17 that process, any that were still under
18 classification review, if there's new
19 documents available if they can be posted.
20 But there's no outstanding actions on data
21 validation. I think they've addressed that.

22 **MS. MUNN:** Right.

23 **MR. GRIFFON:** The coworker model, I think,
24 for both external and internal we've come to a
25 consensus that it's not an SEC issue. Neutron

1 dose is done; addressed adequately by NIOSH
2 and the recycled uranium. So I think we're in
3 good shape.

4 **DR. NETON:** Mark, the only other issue that
5 I would add is that we agreed to address this
6 Building 97-20 dash --

7 **MR. GRIFFON:** Oh, yes, 97-20 dash 5; is that
8 it?

9 **DR. NETON:** We'll put a paragraph out on
10 that and send it around.

11 **MR. GRIFFON:** I'm sorry.

12 **MS. MUNN:** And the only reservation I would
13 have with respect to the coworker model,
14 whether it is or is not an SEC issue, is the
15 question of the whole concept is the SEC being
16 that you're unable to adequately address
17 potential doses for (inaudible) --

18 **MR. GRIFFON:** Well, it's feasible to
19 estimate a plausible -- a maximum plausible
20 dose, right? So I think I'm satisfied that
21 they can in all these instances for uranium
22 and for external calculate maximum plausibles.

23 **MS. MUNN:** So the NIOSH position will be
24 that it is possible to do dose reconstructions
25 for individuals that have definitive SEC or

1 not?

2 **MR. GRIFFON:** That have -- I didn't hear the
3 last part of your sentence. That had what?
4 For uranium and external I think that probably
5 will be. I don't want to put words in Jim's
6 mouth, but that will probably be their
7 position, yes.

8 **MS. MUNN:** Is that correct, Jim?

9 (no response)

10 **MS. MUNN:** Jim's not there anymore.

11 **MR. GRIFFON:** Jim?

12 **DR. NETON:** I'm sorry, was there a question
13 for me?

14 **MR. GRIFFON:** Wanda was saying is it going
15 to be NIOSH's position that you can with these
16 coworker models calculate maximum plausible
17 doses for all individuals in the SEC period?

18 **DR. NETON:** Yes.

19 **MR. GRIFFON:** And that would be for uranium
20 and external I pointed out, not for --
21 obviously, not for the thorium and the --

22 **DR. NETON:** Right. There's a separate
23 exception of thorium buildings we identified
24 in the cyclotron area. Those are internal
25 exposures.

1 **MR. GRIFFON:** Right, so I think that is,
2 yeah.

3 **MR. TANKERSLEY:** Mark?

4 **MR. GRIFFON:** Yes.

5 **MR. TANKERSLEY:** This is Bill Tankersley.
6 One last time in the interests of perhaps
7 closure let me tell you I have looked for, you
8 know, salvage in job titles after 1949.
9 There's actually only 281 of them all of which
10 resolved down to three, which are salvage
11 handlers, salvage keeper, salvage foreman.
12 And I'm pretty sure these are different type
13 of people than what we're talking about.
14 They're working in the salvage yard and that
15 kind of thing. I'm pretty sure those other
16 people are now chemical operators. So that
17 ought to at least perhaps close that question.

18 **MR. GRIFFON:** So that's after '49?

19 **MR. TANKERSLEY:** 12, 31, 49.

20 **MR. GRIFFON:** Okay. Those should show up in
21 the database that I have.

22 **MR. TANKERSLEY:** Yes.

23 **MR. GRIFFON:** Okay. Very good, that's fine.
24 And like I said, I think we're satisfied with
25 the assessment either way, you know, yeah.

1 Is that everything?

2 (no response)

3 **MR. GRIFFON:** John?

4 **DR. MAURO:** As far as marching orders go for
5 SC&A, I presume that the draft report that you
6 and Jim had a chance to look at, we will now
7 proceed to finalize and distribute to
8 everyone.

9 **MR. GRIFFON:** That would be great.

10 **DR. MAURO:** And we'll do that. We're going
11 to do the best we can to do that by the end of
12 the day tomorrow, but at worst it will be in
13 everyone's hands electronically on Monday. I
14 think that should be -- you know, I know
15 Tuesday's a travel day so we should have it,
16 and it's not a big report; it's only 16 pages.
17 And hopefully we will be able to capture
18 everything that's been discussed here
19 adequately. And, of course, we'll be prepared
20 for the Board meeting to give a brief overview
21 of that report.

22 **DR. MAKHIJANI:** Yeah, John, my only concern
23 would be typesetting because we haven't yet
24 told Nancy about the --

25 **MR. GRIFFON:** You can work that out, but

1 even if we get it back by then that'd be
2 great.

3 **DR. MAKHIJANI:** It will be out before
4 Monday, certain.

5 **MR. GRIFFON:** And the other follow up is,
6 Jim, I assume these supplements, will they be
7 provided before the Board meeting or at the
8 Board meeting or how?

9 **DR. NETON:** Oh, no, they'll be provided in
10 advance of the Board meeting.

11 **MR. GRIFFON:** In advance of, okay.

12 **DR. NETON:** It's my intent to have this done
13 by tomorrow, but they're not going to last
14 very long. There's going to be a few pages to
15 highlight the issue and what our action is.

16 **MR. GRIFFON:** My only action for SC&A on
17 that regard would be to review these
18 supplements and be familiar with them and
19 ready to discuss them, not necessarily to have
20 any sort of written analysis. I don't think
21 that's necessary at this time.

22 **DR. MAURO:** Our report will read as current
23 as of today.

24 **MR. GRIFFON:** Right.

25 **DR. MAURO:** That is, any new material that

1 might come in after today will not be
2 addressed in our report, but certainly we will
3 look at all material that comes online between
4 now and when we leave for D.C.

5 **MR. GRIFFON:** That's all -- that's the only
6 action I would think would be fair and
7 necessary, yeah.

8 **DR. MAURO:** Okay.

9 **MR. PRESLEY:** It's Bob Presley. How about
10 bringing mine to the meeting? I'm leaving
11 tomorrow.

12 **DR. NETON:** I will do that, Bob. We'll have
13 copies for everyone at the meeting. Once it's
14 the petitioners have it, then we'll make it
15 available to the public.

16 **MR. GRIFFON:** Great.

17 **DR. NETON:** Not a problem.

18 **MS. MUNN:** And thank you John and Arjun for
19 reducing 62 pages to 16. That's much
20 appreciated.

21 **MR. GRIFFON:** But they reference back to the
22 original. No, I'm just kidding.

23 **MR. CHEW:** Mark?

24 **MR. GRIFFON:** Yeah.

25 **MR. CHEW:** This is Mel Chew. Jim, please

1 stop me if I'm going to be out of line. I'm
2 going to keep it short.

3 Wanda?

4 **MS. MUNN:** Yes.

5 **MR. CHEW:** This is going back to something
6 that you brought up earlier and I've been
7 thinking about it very carefully, and this is
8 what you consider the precedent setting about
9 the -- how we're addressing the polonium
10 exposures and cyclotron, and I'm not going to
11 go there.

12 But I've been thinking throughout the
13 complex we're going to run into situations
14 that are fairly similar to that, like going
15 back into after we had a spill that people are
16 going to be cleaning up and elevated the
17 levels there where we cannot basically --
18 either there was no incident that occurred
19 when they were doing that, like they didn't
20 tear off a suit, or they couldn't find any
21 confirmatory bioassay that showed that the
22 protective clothing was defective.

23 I can think of several situations
24 already throughout the complex, you know,
25 being in operational HP; you know, the size

1 reduction and why Rocky Flats spills that
2 we've had in some other plutonium facilities.
3 So I just want to make sure that your comments
4 don't fall through the crack is a very
5 excellent thought that we need to think about
6 how to address those kinds of situations where
7 we don't have either confirmatory bioassay or
8 incident reports, okay? I just want to leave
9 it that way. I think -- I wanted to make sure
10 that your thought was outstanding there.

11 **MS. MUNN:** I appreciate that. I really do.

12 **MR. CHEW:** Anyway we can help to think about
13 it, whether it's the process that either
14 working boards or the future board members to
15 address that kind of situation because I'm
16 sure we're going to be seeing them in other
17 sites here, Wanda.

18 **MR. GRIFFON:** All right. Is there anything
19 else to add? Somebody got a concert in the
20 background?

21 **MR. STEMPFLEY:** Hi, Mark, this is Dan
22 Stempfley; can you hear me?

23 **MR. GRIFFON:** Yes.

24 **MR. STEMPFLEY:** I had a quick question on
25 the external discussion that at the very end

1 here we said that from the external
2 perspective we can only reconstruct dose for
3 uranium; is that the discussion that you and
4 Jim had? We're not including external dose
5 reconstructions?

6 **MR. GRIFFON:** No, no, no. I said the
7 coworker models for uranium internal or
8 external, not uranium external, but external
9 overall. I think, yeah.

10 **DR. NETON:** External dosimetry is okay.

11 **MR. GRIFFON:** Right.

12 **MR. STEMPFLEY:** But the coworker model does
13 not apply to the thorium; is that what we're
14 saying?

15 **DR. NETON:** No. We can talk offline, Dan.

16 **MR. GRIFFON:** Jim, you know what we're
17 saying.

18 **DR. NETON:** I know where we're at.

19 **MR. GRIFFON:** All right. And anything else?
20 Any other issues? I think we're ready to
21 close, and way before 4:30, I might add.

22 **DR. MAURO:** Very good.

23 **MR. GRIFFON:** There was no way I was going
24 to do this all day.

25 **MS. MUNN:** You wouldn't get through the

1 first time.

2 **MR. GRIFFON:** I know. All right. So we'll
3 look forward to the supplements and the final
4 SC&A report, and see y'all next week.

5 **DR. NETON:** All right. Good enough.

6 **MR. PRESLEY:** Hey Wanda?

7 **MR. GRIFFON:** Bye, everyone.

8 **MS. MUNN:** Yes?

9 **MR. PRESLEY:** Give me a call.

10 **MS. MUNN:** I certainly will do that.

11 **MR. PRESLEY:** Thank you.

12 **MS. MUNN:** Thank you. Bye-bye.

13 (Whereupon, the working group
14 teleconference concluded at 12:10 p.m.)

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I, Steven Ray Green, Certified Merit Court Reporter, do hereby certify that I reported the above and foregoing on the day of June 8, 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 1st day of August, 2006.

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