

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

convenes the

WORKING GROUP MEETING

ADVISORY BOARD ON
RADIATION AND WORKER HEALTH

ROCKY FLATS

The verbatim transcript of the Working
Group Meeting of the Advisory Board on Radiation and
Worker Health held telephonically on April
30, 2007.

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TRANSCRIPT LEGEND

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

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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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(By Group, in Alphabetical Order)

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SMITH, MATTHEW, ORAU
ULSH, BRANT, NIOSH

P R O C E E D I N G S

(12:00 p.m.)

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2WELCOME AND OPENING COMMENTSDR. LEWIS WADE, DFO3
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DR. WADE: Mark, do you want to wait for Joe?
Joe Fitzgerald, with us?

(No response)

MR. GRIFFON: No, I -- I think we can probably
go ahead. Joe said he'd get to a line as
quickly as he could and join us.

DR. WADE: Okay. Well, this is a meeting of
the workgroup of the Advisory Board. It's a
workgroup that looks at Rocky Flats site
profile and SEC petition issues. My name is
Lew Wade and I serve as the Designated Federal
Official for the Advisory Board that has given
rise to this workgroup. The workgroup on Rocky
Flats site profile and SEC petition is chaired
by Mark Griffon, with members Gibson, Presley
and Munn. I've heard all of those fine people
identify themselves as being on this call.
Ray, are you with us and ready to go?

THE COURT REPORTER: Yes, sir.

1 no personal conflicts.

2 **MS. BRACKETT:** Liz Brackett with the ORAU team;
3 no conflicts.

4 **MR. SMITH:** This is Matthew Smith with the ORAU
5 team; no conflicts.

6 **MR. FIX:** Jack Fix, ORAU team; no conflicts.

7 **MS. LOPEZ:** Teresa Lopez, ORAU team; no
8 conflicts.

9 **MR. ELLIOTT:** This is Larry Elliott,
10 NIOSH/OCAS; no conflicts.

11 **DR. WADE:** Other members of the NIOSH/ORAU
12 team?

13 (No responses)

14 Members of the SC&A team?

15 **DR. MAURO:** This is John Mauro, SC&A; no
16 conflicts.

17 **DR. WADE:** Other members --

18 **DR. MAKHIJANI:** Arjun Makhijani, SC&A; no
19 conflicts.

20 **MR. BUCHANAN:** Ron Buchanan, SC&A; no
21 conflicts.

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

23 (No responses)

24 Other federal employees who are working on this
25 call?

1 **MS. HOWELL:** This is Emily Howell with HHS; no
2 conflicts.

3 **MS. HOMOKI-TITUS:** Liz Homoki-Titus with HHS;
4 no conflicts.

5 **MR. BROEHM:** Jason Broehm, CDC; no conflicts.

6 **MR. KOTSCH:** Jeff Kotsch, Department of Labor.

7 **DR. WADE:** Welcome, Jeff.

8 **MS. ERNEST:** Heather Ernest, NIOSH; no
9 conflicts.

10 **DR. WADE:** Other federal employees?

11 **MS. DOWNS:** Alycia Downs, NIOSH; no conflicts.

12 **DR. WADE:** Workers, worker reps, petitioners or
13 their representatives, members of Congress or
14 their staff?

15 **MS. BOLLER:** Carolyn Boller with Congressman
16 Udall's office.

17 **DR. WADE:** Good morning.

18 **MS. BOLLER:** Good morning.

19 **MS. ALBERG:** Jeanette Alberg with Senator
20 Allard's office.

21 **DR. WADE:** Good morning.

22 **MS. ALBERG:** Good morning.

23 **MR. HILLER:** David Hiller, Senator Salazar's
24 office.

25 **DR. WADE:** Good morning, David.

1 **MR. GRIFFON:** Okay, I think I e-mailed an
2 agenda but everybody may not have it and
3 actually when Lew was doing roll call I tried
4 to pull it up myself. I'm going to do it from
5 memory, though.

6 **MS. MUNN:** Overview.

7 **MR. GRIFFON:** Basically the first two items are
8 neutron-related items and I broke it up into --
9 into time periods because that's kind of the
10 way we've been looking at it on the technical
11 phone calls that we've had in between the
12 workgroup meeting. So the first one, the
13 neutrons for the period 1952 through 1958, and
14 I think really what we need to do on this call
15 today is to update everyone -- there -- not
16 everyone was on the technical phone call,
17 obviously, so I think we need to kind of say
18 where -- what came out of that technical phone
19 call and any further information that we might
20 have from either SC&A or NIOSH, they can share
21 that.

22 And then the -- the second period is 1959
23 through '70 that -- that is the end of the NDRP
24 time frame, and because of the tight time frame
25 we never did have a technical call on that part

1 of the time frame and the issues there. And
2 actually SC&A sent a report around but I -- it
3 didn't get to most people until mid or late --
4 late on Friday, so this is like hot off the
5 press, this issue, and we need to discuss the
6 findings from that, have SC&A present them and
7 -- and have more of a full discussion on that
8 time frame.

9 And then the remainder of the agenda covers
10 sort of some -- some other issues, non-- not
11 the neutron issues but the -- I'm trying to
12 remember the order of these --

13 **MS. MUNN:** You started on your agenda with the
14 overview of the executive summary and the five
15 primary points.

16 **MR. GRIFFON:** Oh, that's the old agenda, Wanda.

17 **MS. MUNN:** Oh, it is?

18 **MR. GRIFFON:** That was from the last meeting,
19 yeah.

20 **DR. MAKHIJANI:** Mark, I might -- I might have
21 it --

22 **MR. GRIFFON:** Yeah.

23 **DR. MAKHIJANI:** -- let me try to pull it up.

24 **MR. GRIFFON:** Yeah. And -- and yeah, the --
25 well, there -- there's a few other issues. One

1 is the -- the 881 -- Building -- the Plant B or
2 881 workers and the -- the -- just further --
3 final discussion I guess on that as to whether
4 the coworker model will bound those -- those
5 doses for the early years 'cause we -- we did
6 find several of those workers who did not have
7 monitoring data, so I was just going to kind of
8 close out on that question.

9 The TIB-38 coworker model, which is the
10 internal dose coworker model -- again, a final
11 discussion of -- of -- of sort of how -- how
12 that model was to be applied, I guess was the
13 real question there.

14 Then we also had sample cases, some of these
15 proof of principle cases that we wanted to go
16 over and NIOSH had provided those, and as of
17 the last worker meeting SC&A didn't really have
18 -- didn't have the time at that point to review
19 those cases so we wanted to just finally touch
20 base on those. I think some of those involved
21 -- well, I know one is external coworker model,
22 one is the internal coworker model and one is a
23 super S case, so I think -- to the extent we
24 don't discuss those in our other discussions --
25 we can look at those cases.

1 And then I guess the final sort of point on the
2 agenda was to -- for the workgroup to discuss
3 the -- the path forward with how we're going to
4 present -- how we are going to present, as a
5 workgroup, to the Board and -- and just maybe
6 the -- the logistics of that in the next couple
7 of days.

8 So I think that was the main thing. If I
9 missed anything, I'm -- I'm sure I'll find it
10 when we start talking here. I'll look for the
11 agenda.

12 **MS. MUNN:** Well, you're -- you're right. You
13 went down it pretty well. I finally found the
14 right one.

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

16 **MS. MUNN:** Sorry.

17 **NEUTRON ISSUES, '52 THROUGH '58**

18 **MR. GRIFFON:** But I -- first item on there --
19 and the first two items obviously are the most
20 two sort of critical right now, and if I could
21 ask I think either Arjun or Brant -- Arjun or
22 Brant, I don't care really -- it doesn't matter
23 who goes first, but gi-- maybe give us an
24 update on the '52 through '58 time period from
25 that technical call that we had, and from your

1 supplemental report -- I guess it makes sense
2 to start, Arjun, with you. Then Brant can --
3 can add in after.

4 **DR. MAKHIJANI:** Okay. Well, we took at look at
5 a number of different angles of the '52 to '58
6 period, having -- some of them in the prior
7 calls that we had, NIOSH and SC&A agreed. And
8 the main big picture point on which there is
9 agreement -- Brant, correct me if I'm wrong --
10 is that the '52 to '58 data are themselves not
11 adequate to do the dose reconstruction. The
12 data were mostly restricted to Building 91.
13 The Building 71 data, there were some, but most
14 of them are not available or could not be
15 available for rereading. The -- and so
16 essentially the evaluation and the dose
17 reconstruction depend on the use of 1959 data
18 for -- for calculating a neutron-to-photon
19 ratio and evaluating or estimating the doses
20 for '52 to '58 by building. And so I think --
21 I think on that much there is pretty much
22 agreement.

23 And then there is the question of whether the
24 back-extrapolation works and whether it has
25 been shown to be claimant-favorable or a best

1 estimate or somewhere in that realm, or whether
2 it is scientifically defensible or not. And on
3 that piece there -- there has not been
4 agreement, at least until the last call.
5 What we did was we investigated whether there
6 is some piece of '52 to '58 data, either for
7 Building 71 or Building 91, which were the main
8 buildings in that period although 76 and 77
9 were added and there are some others -- whether
10 there's some way in which this back-
11 extrapolation -- against which this back-
12 extrapolation can be -- can be checked. And
13 there was the statements that are documented
14 there, at least initially, that the workers who
15 were badged in the '52 to '58 period were those
16 who were thought to be at highest risk. And
17 there's a little bit -- the record's a little
18 bit murky on this, but if I go by what Roger
19 Falk has said, it -- it is that there -- there
20 were a special group of period -- people, at
21 least initially in Building 91, who were
22 handling a special neutron source who were
23 thought to be at highest risk and therefore
24 they were badged. And actually the data bear
25 that out in that in -- in 1952 and 1953 the

1 neutron doses from Building 91 are -- are quite
2 a bit higher than -- and then they tend to go
3 down, all the way to 1999. And that was the
4 table, unfortunately, that I revised and sent
5 out yesterday 'cause it didn't -- it didn't
6 change the numbers significantly, but the
7 original numbers were a little bit off because
8 of the gamma com-- small gamma component in
9 there that shouldn't have been in there. And
10 the -- the -- broadly, the -- the -- the
11 neutron doses were declining in Building 91 and
12 they were higher -- see, we try to compare them
13 with -- with the notional doses, taking the
14 NDRP statement of purpose at face value that
15 they tried to make a best estimate dose. And
16 if you -- if you look at Figure 1, I think,
17 you'll see that most of the measured neutron
18 doses are less than most of the notional doses
19 in 1955. In 1953 it was the reverse -- the
20 year of the high neutron doses in Building 91.
21 All the measured doses were at the -- among the
22 top ten doses. So we found a very mixed
23 picture. We couldn't find any way to actually
24 find a benchmark in that period to validate
25 this back extrapolation. For Building 91 the

1 doses -- neutron doses were the lowest in 1959.
2 Of course the NP ratios -- the ratio of neutron
3 to photon -- and you'd -- so you'd need a full
4 -- full-blown analysis, but mainly what is --
5 we looked then into what is the physical basis
6 for the comparison.

7 It turns out that there were a very large
8 number of changes in what was done in these
9 buildings, how it was done, the job types. In
10 the '56 to '58 period there was an expansion of
11 the operation. Two new buildings were built.
12 Metal-working operations were transferred from
13 71 to 76. Assembly operations were transferred
14 from 91 to 77. It's not clear to me whether
15 the neutron sources that were initially handled
16 remained the same. This is something we didn't
17 investigate, but the neutron doses in Building
18 91 declined after 1953, raising a question
19 about that.

20 Then there was a new chem line -- chemistry
21 line that was added in Building 71 to do the
22 plutonium chemistry, and that changed the way
23 in which the work was done. Initially it was
24 done remotely and there was -- there were a lot
25 of maintenance problems with that. There were

1 a lot of clogging of the lines that had to be
2 then cleared manually. And so then
3 subsequently, starting in '57 or '58, the work
4 was done manually and then there was less
5 maintenance. Roger Falk stated that the
6 neutron doses from routine operations went up
7 and maintenance operations went down, but on
8 balance the neutron doses went up. There's
9 been no real quantitative test of this balance
10 because we have no data for Building 71 in --
11 in the relevant period with the old equipment
12 and the old way of doing things.
13 And we have the problem of job types, as well,
14 because the balance between the job types
15 changed. And while workers were following the
16 batches of plutonium from beginning to end, the
17 -- there are different dose groupings indicated
18 when -- when you do look at the neutron doses
19 that are available in -- in Building 71. So
20 it's not that everybody was getting the same
21 order of magnitude of doses so you can assume
22 there was one type of job.
23 So overall we found that while NIOSH has stated
24 that the changes were claimant-favorable and
25 that NDRP calculations are claimant-favorable,

1 we couldn't find any analysis that -- that
2 could make this quantitatively demonstrable and
3 -- and a very significant number of chan--
4 well, the pit design changed, too, to a hollow
5 pit -- very significant number of changes means
6 that you have to do a quantitative analysis to
7 demonstrate that this back-extrapolation is
8 claimant favorable. We -- we saw no -- no easy
9 way nor -- in which it could be done. And in
10 fact, we saw no way to assure that if you spent
11 a lot of time that -- that you could actually
12 arrive at a scientifically credible result.
13 We did one more test, which was for the '59 to
14 '70 period where we do have workers who have a
15 lot of neutron monitoring data, more than six
16 months to a full year of neutron monitoring,
17 and we applied the NP method to those workers
18 to see whether the result is claimant
19 favorable. We took one worker from 71, one
20 worker from 91 for each year from '59 to '70.
21 Of course for -- for any one year it's not a
22 statistically significant test, but overall we
23 had 21 workers for whom we did this calculation
24 and that calculation is presented in Table 4.
25 And we -- we -- we found that in most cases the

1 notional dose was less than the measured dose
2 in actually -- out -- out of 21 cases, it was
3 less than the measured dose in 18 cases. And
4 if you ignore the ones that were in the 90
5 percent, there were -- one, two, three -- four
6 of them. So in 14 out of 21 cases, you had --
7 you had the notional dose that was less than 90
8 percent, and the lowest one was as low as -- as
9 22 percent. There were -- there were three
10 results that were in the 20 percent range.
11 So that test also of the claimant favorability
12 of the NP method didn't work. I mean we looked
13 at the NDRP and -- and its origin, and the --
14 the rereading of the badges and the whole
15 project was conceived in the context of an
16 epidemiological study of grouping workers
17 together. From that point of view for
18 buildings you may use the reread badges for --
19 for that purpose, but at least we could not
20 find it demonstrated that it's working for
21 this. And certainly for the '52 to '58 period
22 it -- it seems -- it seems, as things stand,
23 that it did not demonstrate it to be claimant
24 favorable and one doesn't know whether it could
25 ever be because there's no benchmarking data.

1 **MR. GRIFFON:** Arjun, is --

2 **DR. MAKHIJANI:** I -- I think that I've covered

3 --

4 **MR. GRIFFON:** Yeah.

5 **DR. MAKHIJANI:** -- I've covered the main
6 points. I mean you -- the first part of the
7 report is -- does deal with '52 to '58
8 primarily and -- and the data -- if you want
9 the summary of, you know, visual -- visual
10 results, you can -- you can look at Table 1,
11 which is on page 15, where you have this
12 comparison of which -- whether the notional
13 dose workers were more exposed or monitored
14 worker were more exposed, assuming that the
15 notional dose is a best estimate, of course.
16 So this is only an indicative comparison
17 because we have questions about notional dose.

18 **MR. GRIFFON:** Just to -- to check, I'm not -- I
19 -- I should have done this at the outset of the
20 call, but does everyone have this supplemental
21 report? Has this been cleared by privacy
22 review?

23 **DR. MAKHIJANI:** Yes, it has been cleared. I
24 mean one reason why I took a little bit long is
25 we were technically proofing this and checking

1 the numbers at the same time as it was
2 undergoing privacy review, and so we kind of
3 did a final cleanup of the report as -- as Liz
4 and Emily were reviewing this, and so we were
5 able to get it out to everyone, with -- with
6 technical corrections, on Friday.

7 **MR. GRIFFON:** All right. Okay, so -- so maybe
8 Brant, this would be a good time to let you --

9 **DR. ULSH:** Okay.

10 **MR. GRIFFON:** You know.

11 **DR. ULSH:** Well, as everybody knows, we're
12 under the gun on this. We've really been
13 getting down into the weeks on NDRP for the
14 past few weeks. I did get the first part of
15 SC&A's report that dealt with the '52 to '58, I
16 believe -- or maybe '59 -- time period on
17 Tuesday. I had a little bit of time to react
18 to that. I never got the supplemental of the
19 report that deals with post-'59. That is to
20 say SC&A never sent that to me. However, I did
21 get it through the NIOSH grapevine late in the
22 day on Friday, so I can comment a little more
23 confidently about '52 to '58.

24 **DR. MAKHIJANI:** Brant, the -- the '52 to '58
25 part is also revised in the -- what you have

1 because we had a conference call after the
2 Monday report and those are all back and forth
3 and we have the minutes or -- from that call
4 that are now part of this report, and some of
5 that discussion is reflected in the new '52 to
6 '58.

7 **DR. ULSH:** All right, thank you. There's a
8 couple of things I think we need to talk about
9 in the '52 to '58 time period, and the first
10 thing is that the Neutron Dose Reconstruction
11 Project went through detailed time lines for
12 the people that were included in the project,
13 by badge exchange cycle, and placed them in
14 buildings. So we know, for instance, which
15 people were in Building 71, which people were
16 in Building 91, et cetera. And so I -- I think
17 it's worthwhile noting that when you try to say
18 something about '52 to '58 as a -- as a unit,
19 that might be too broad a brush stroke, and
20 I'll get into what I mean by that in -- in a
21 few minutes.

22 I do want to clarify this benchmarking issue
23 because it has come up a number of times, and I
24 also want to talk about who was monitored and
25 who wasn't and I'll go through some relevant

1 time lines here.

2 First of all, I think the situation is very
3 different in Building 91 compared to Building
4 71. Let's start with Building 91. It was
5 constructed -- construction was completed in
6 1952. It was, I believe, the first building on
7 site completed. The main activities in that
8 building were the shipping and receiving of
9 plutonium -- you know, materials from off-site
10 and also, as Arjun mentioned, the final
11 assembly. So when things were getting ready to
12 leave the Rocky Flats site, they left from
13 Building 91. And also as Arjun mentioned, in
14 1957 the final assembly operations were
15 transferred to the newly-operational Building
16 77.

17 And over the course of 1952 to 1959, you see
18 that about -- I mean we've talked about that
19 there were 20 neutron dosimeters available for
20 badge exchange. And gee, that sure doesn't
21 sound like a lot. But when you look at the
22 number of people who were gamma monitored in
23 Building 91 by year and you look at the number
24 of people who were neutron monitored in 91 by
25 year, you see that it varies anywhere from 21

1 percent to 41 percent.

2 Now I want to be clear what I'm talking about
3 here. I'm talking about of the people who were
4 monitored for gamma, approximately 21 that can
5 be -- if you divide the number of people
6 monitored by neutron over the number of people
7 monitored for gamma, you get about 21 percent
8 to 41 percent. So you know, that's not a
9 majority, but it's certainly -- I want to make
10 that clear what we're talking about here, what
11 fraction of the monitored population was
12 actually monitored for neutrons.

13 One thing I also need to clarify is that when
14 we say that people were not monitored, I -- I
15 know that SC&A and -- and NIOSH and probably
16 the working group know this, what we're talking
17 about is neutron monitoring.

18 **DR. MAKHIJANI:** Correct. I mean it's stated
19 explicitly in the report.

20 **DR. ULSH:** Exactly. Exactly, I just want to
21 point that out. So I mean we are using
22 individuals' own data to the extent that they
23 have gamma monitoring, so it's really neutron
24 monitoring that we're talking about.

25 And as mentioned, as the years went by in 91,

1 the total neutron dose rate tended to drop,
2 until you got to a point where both the gamma
3 and the neutron doses that you were seeing were
4 very near the limit of detection. And this is
5 a critical point because the NDRP faced a
6 choice when looking at Building 91. They could
7 look at the -- the ratio that was observed in
8 1959 in Building 91, or they could look at the
9 ratio observed in Building 77 and apply that,
10 because that's where the final assembly
11 operations went. Because the ratio was higher
12 in 91 in 1959, they chose to use that ratio.
13 And there's an interesting phenomenon in play
14 here. The neutron doses did not have
15 background subtracted from them. Now that's
16 the numerator of your ratio. Then the dose,
17 that's the denominator, did have background
18 subtracted. And that's why, once you get down
19 near the LOD, limit of detection, that's why
20 you see a higher NP ratio in Building 91. And
21 then we're taking that higher ratio and
22 applying that back to the gamma doses that were
23 observed in the early years. That is the
24 reason that we're saying this is a very
25 claimant-favorable thing to do. I would con--

1 I would say that the estimates provided in the
2 NDRP could be characterized as claimant
3 favorable best estimates.

4 The situation is a little bit different in
5 Building 71. Building 71 was constructed in
6 1952 and -- now here's an interesting thing
7 that may not be obvious. If we are concerned
8 from an SEC standpoint about neutron doses
9 experienced by the workers from handling
10 plutonium, and also the neutron
11 (unintelligible) in 91, well, I don't think
12 that we should be -- even talking about 1952 or
13 indeed prior to May, 1953 in Building 71
14 because the first batch of plutonium was
15 introduced into the chem line in May of 1953 in
16 Building 71. So if our concern is neutrons
17 from plutonium, it doesn't make sense to me
18 that we're talking about any time prior to May,
19 1953.

20 Now, as Arjun mentioned, in 1957 or thereabouts
21 -- I think the funding for the expansion of
22 Building 71 occurred in (broken transmission)
23 and the actual expansions occurred in '56 into
24 '57, I can't really recall. But they did add
25 what was called the east chem line, and also in

1 Building 71 in 1957 you see some degree of
2 neutron monitoring. I don't want to oversell
3 that. It was not a lot.
4 And then another important event happened in
5 '57 -- this was an active year in terms of what
6 you might expect in Building 71. As Arjun
7 mentioned, the -- the machining operations were
8 transferred over to Building 77, and that was
9 precipitated by a large plenum fire that
10 occurred in September of 1957, and that shut
11 down operations until the latter part of 1958.
12 So you're not going to see many -- you know,
13 much neutron exposure between that plenum fire
14 until the latter part of 1958. And then later
15 in 1958 there was the resumption of plutonium
16 chemistry operations and neutron monitoring's a
17 bit more widespread in 71 in that year.
18 So if you're concerned about the back-
19 extrapolation from 1959 to those earlier years,
20 one thing that you've got to keep in mind in
21 Building 71 was that the primary neutron
22 exposure source was the plutonium chemistry and
23 in particular the fluorination of the
24 plutonium, and that did not change between --
25 well, over -- prior to 1959. There was one

1 exception, and that was -- to accommodate the
2 changed pit design that Arjun mentioned -- the
3 batch size increased from 200 grams to about on
4 the order of 1,200 grams. There's no reason to
5 think that that would have changed the ratio,
6 the neutron-to-photon ratio. So as you go back
7 in time, it is true that when you're trying to
8 apply 1959 ratio to earlier years, it becomes -
9 - I think speculative was the word that was
10 used, the further back in time you go. But I
11 would ask you to consider whether or not '58
12 can be related to '59. I mean this was after
13 all these changes that we contend would have
14 increased the NP ratio. I know that that's not
15 agreed-to by SC&A, but it begs the question of
16 why the '59 ratios could not be applied in '58,
17 maybe even in '57, although, you know, you did
18 have some events there in '57.
19 And getting back to this benchmarking issue, it
20 is certainly true that there are no field
21 survey type of data that were available for the
22 NDRP. That is not a point that is in
23 disagreement. However, there are limited
24 neutron and photon monitoring for those people
25 who were monitored. And as I said, that ranged

1 between 20 and 40 percent of 199-- I'm sorry,
2 20 and 40 percent of 91 workers and less for
3 Building 71. And in Building 71 you have
4 neutron monitoring beginning in '57, then they
5 had the fire that shut down operations, then
6 they resumed. In 1958 you see more monitoring,
7 still not a lot, then widespread monitoring I
8 guess in 1959.

9 And what we observed from the monitoring that
10 was done, in Building 91 there were -- well, I
11 don't really know how many plates exactly there
12 were, but from the paired data that are
13 available, we observe an NP ratio of -- and let
14 me be clear; I'm talking about simply the sum
15 of the gamma doses over the sum of the neutron
16 doses -- and we observe a ratio of 2.23, and
17 that -- and that's between 1952 and 1958. So
18 all those years taken together, that's the
19 period we're talking about extrapolating. And
20 then what we observe in 1959 is the ratio of
21 3.6, so to the extent that this data is
22 informative -- and I agree that it is limited,
23 so it should be weighed as only part of the
24 evidence -- you know, part -- weight of the
25 evidence, it looks like that is claimant

1 favorable.

2 Building 71, we only had limited neutron
3 monitoring from '57 and '58, and we observe a
4 ratio of 1.31 compared with the 1959 ratio of
5 1.4 -- again, claimant favorable.

6 I'll let you draw your own conclusions about
7 the strength of that. There are certainly some
8 limits to how much confidence should be placed
9 in this. But the data that does exist do
10 suggest that the ratio to 1959 are claimant
11 favorable for back-extrapolation.

12 And I'm looking at my agenda here to see if
13 there's anything else that I need to say about
14 those. Oh, yes, let me see.

15 Table 4, I think Arjun mentioned this table,
16 but it might refer to the later time period and
17 I think maybe we want to limit our conversation
18 to '52 to '58 right now and then maybe talk
19 about '59 forward later. Is that what I'm
20 thinking, Mark?

21 **MR. GRIFFON:** Yeah, I guess so -- yeah, maybe
22 we -- you know, we have enough to chew on there
23 for that one period, so --

24 **DR. ULSH:** All right, so I think that is pretty
25 much all I want to say about '52 to '58.

1 **DR. MAKHIJANI:** Mark, could I make one comment
2 about what has just transpired? It is that the
3 -- the -- I said this before but I wanted to
4 reiterate it in this context is the nature of
5 the work in Building 71 changed, and this --
6 this was discussed during the April 24th call
7 and the current report is revised to reflect
8 that discussion, which is that in the earlier
9 period the pluton-- in Building 71 the
10 plutonium chemistry was done differently than
11 it was in the new chem line, which is that the
12 operations were remote, but there were a lot of
13 maintenance problems which were done manually.
14 And then later on there were fewer maintenance
15 problems, but the operations were done
16 manually. We don't have any quantitative data
17 to compare the balance of how the neutron to --
18 doses were between maintenance and routine
19 operations, much -- much less to actually go on
20 to -- to the neutron-to-photon ratios. And we
21 also don't have a job type analysis because
22 NDRP decided to do a building aggregation. And
23 so this -- this is actually a -- a very
24 significant problem. And the other thing is
25 that new job types were introduced into

1 Building 71, which was the incinerator which
2 was built in 1958 and we don't have any
3 separate data for NP ratios or gamma and
4 neutron doses by job type. They -- they --
5 they would exist in the individual claimant
6 data and in the job cards and so on, but it's
7 not integrated into the NDRP analysis in any
8 way.

9 **DR. ULSH:** Well, in terms of the incinerator,
10 Arjun, I -- I question whether that would have
11 any appreciable impact at all because the dose
12 rates are so low.

13 **DR. MAKHIJANI:** I -- I'm not (unintelligible) -
14 - all I'm pointing out is we -- we've not said
15 that the NIOSH conclusion is wrong. All we've
16 said is that we haven't found any quantitative
17 analysis and the -- the changes were very, very
18 significant. And in the earlier period for
19 Building 71 the data do not appear to exist
20 against which to confirm this.

21 **DR. ULSH:** Well, I -- I --

22 **DR. MAKHIJANI:** (Unintelligible) is at the core
23 of the argument.

24 **DR. ULSH:** Well, I have just presented some
25 data that -- well, that -- for Building 71,

1 that's from '57 and '58 so I don't want to try
2 to extend that back. But yeah, we're pretty
3 much arguing from first principle here because,
4 as you said, at least in Building 71 -- now
5 this is certainly not true in Building 91 --
6 but in Building 71 there was no neutron
7 monitoring prior to 1957, so that is a point
8 taken.

9 **DR. MAKHIJANI:** And the '57 data don't ap-- we
10 found only data from late '58 for Building 71.

11 **DR. ULSH:** No, there is Buil-- there is '57
12 data.

13 **MR. BUCHANAN:** Okay, it's not -- this is Ron.
14 It is not on the matched pair -- neutron --
15 beta/gamma and matched pair on the NDRP on the
16 O drive. We did receive a little bit of data
17 on the CD or something that was sent earlier,
18 in January, that had a few workers results in
19 '57. But if it's on the O drive under the
20 NDRP, I have not found it yet if it's there.
21 Now, the main body of the neutron/photon
22 matched pair does not contain any '57 data for
23 that building.

24 **DR. ULSH:** I don't know -- Mutty?

25 **MR. SHARFI:** That -- that's correct, the paired

1 data -- there is -- there is some '57 data that
2 is not in the pair dataset.

3 **MS. MUNN:** Only in '57 data, right?

4 **DR. MAKHIJANI:** But we have no way to compare
5 the NP ratios because we have no matched pair
6 data.

7 **MS. MUNN:** Yes, but we have some raw data from
8 '57, and --

9 **UNIDENTIFIED:** Correct.

10 **MS. MUNN:** -- let me -- let me clarify one
11 question -- one -- one thing I think I heard.
12 Did I not hear that there was no SNM in
13 Building 51 (sic) until sometime in 1953?

14 **DR. ULSH:** Wanda, that was me, I said that,
15 that in -- in -- there was -- the first batch
16 of plutonium -- that was received, I believe
17 from Hanford -- was introduced into Building
18 71, the east chem line, in May of 1953. So
19 prior to that there was no plutonium in
20 Building 71.

21 **MS. MUNN:** So why would there even be an issue
22 about '52 with respect to 19-- Building 71?

23 **DR. ULSH:** Well, that was my question.

24 **MS. MUNN:** There wouldn't be. There was no
25 material there.

1 **DR. MAKHIJANI:** NIOSH has -- has -- and the
2 NDRP has applied NP ratios to -- to Building 71
3 going back to 1952, and we didn't actually
4 investigate the detailed beginning of every
5 particular operation (unintelligible) --

6 **MR. GRIFFON:** (Unintelligible) certainly
7 something we can (unintelligible) --

8 **DR. MAKHIJANI:** -- (unintelligible) documents
9 are classified and we just took the NDRP sort
10 of period as the starting point for our
11 analysis --

12 **MR. GRIFFON:** That's something we certainly
13 want to get right, too, if -- you know, if it
14 came down to --

15 **DR. MAKHIJANI:** Yeah, right, obviously -- no --

16 **MR. GRIFFON:** -- (unintelligible) time frame,
17 yeah.

18 **DR. ULSH:** I'm using an unclassified document
19 as my source for that, it's Putzier's Memoirs,
20 which are on the O drive.

21 **MR. GRIFFON:** That -- that's fine, Brant. I
22 mean we -- we can certainly --

23 **MS. MUNN:** For our purposes --

24 **MR. GRIFFON:** Yeah --

25 **MS. MUNN:** -- yeah, for our purposes,

1 essentially --

2 **MR. GRIFFON:** -- certainly consider the date
3 (unintelligible).

4 **MS. MUNN:** -- 1953 is the date we're looking
5 at.

6 **MR. GRIFFON:** Yeah, I'm not sure that applies
7 to -- to 91 as well?

8 **DR. ULSH:** No, it doesn't, Mark.

9 **MS. MUNN:** Huh-uh.

10 **MR. GRIFFON:** Right, right.

11 **MS. MUNN:** No, no, it (unintelligible) --

12 **MR. GRIFFON:** Okay.

13 **MS. MUNN:** Yeah.

14 **DR. ULSH:** We do have measured neutron doses in
15 91 in 1952.

16 **MR. GRIFFON:** Yeah.

17 **DR. ULSH:** I suspect, although I can't say this
18 for certain, that it has to do with that
19 neutron source --

20 **MR. GRIFFON:** Yeah.

21 **DR. ULSH:** -- rather than the plutonium.

22 **MS. MUNN:** Probably.

23 **DR. ULSH:** In fact, Putzier's Memoirs attest to
24 that.

25 **MR. GRIFFON:** Brant, just one other

1 clarification. You -- you mentioned the shift
2 for some of the operations from Building 91 to
3 Building 71. I think that was in 1957, as
4 well?

5 **DR. ULSH:** It was Building 77, Mark, I believe.

6 **MR. GRIFFON:** 77, yeah.

7 **DR. ULSH:** And I do think you're right. I
8 think it was in 1957.

9 **MR. GRIFFON:** And -- and when they switched
10 assembly operations, was the assembly operation
11 essentially the same operation, or was it a
12 different design that they were assembling or
13 wha...

14 **DR. ULSH:** Well, keep in mind, Mark, that this
15 is right around the time, as -- as Arjun
16 mentioned, that they --

17 **MR. GRIFFON:** Right.

18 **DR. ULSH:** -- initiated the new pit design --

19 **MR. GRIFFON:** Okay.

20 **DR. ULSH:** -- and so that required I believe a
21 bit more extensive activities in terms of the
22 final assembly.

23 **MR. GRIFFON:** Okay.

24 **DR. ULSH:** So that would -- would have been a
25 little bit different.

1 **MR. GRIFFON:** So wou-- again, that's a process
2 change, in my mind, that -- that's simply the
3 way I'm looking at this.

4 **MS. MUNN:** Yeah, I agree. The -- the question
5 in -- that -- that remains for me, however, is
6 whether any concerns with regard to a change in
7 design are covered by the assertion that the
8 larger batch quantities would bound that
9 question.

10 **DR. ULSH:** Well, let me speak to that just a
11 little bit, Wanda. There's a couple of things
12 to consider. First of all, I -- I don't want
13 to get into too much detail about NP ratios
14 from pits. I think we could get into trouble
15 talking about that.

16 **MS. MUNN:** Probably.

17 **DR. ULSH:** However, it is less than one. And
18 I'm reading from Putzier's Memoirs right now
19 and it says that Building 991 -- for workers in
20 Building 991 a piece of NTA film was added
21 since some of the MDT* operations did involve
22 some generation of neutrons. The intended use
23 of the NTA film at that time related to the
24 fact that people who were operating equipment
25 which created neutrons from gamma neutron

1 reaction and not that they were handling
2 plutonium, which gave off neutron radiation
3 also.

4 **MS. MUNN:** Oh, whoa, read that sentence one
5 more time, please.

6 **DR. ULSH:** Okay, let me see, I think I know the
7 one you mean. The intended use of NTA film at
8 the time related to the fact that people were
9 operating equipment which created neutrons from
10 a gamma neutron reaction and not that they were
11 handling plutonium, which gave off neutron
12 radiation also.

13 **MS. MUNN:** Oh, okay.

14 **DR. ULSH:** So I interpret that to mean that the
15 neutron-to-photon ratio that was observed in
16 Building 91 had primarily to do with this
17 equipment that they were operating that we
18 can't go into great detail about.

19 **MS. MUNN:** Right, machinery, other than -- than
20 --

21 **DR. ULSH:** And so the transfer of the final
22 assembly operations, which would have been the
23 lower NP ratio type of operations, taking those
24 out of Building 91 would increase the NP ratio
25 -- and I'm arguing from first principles here -

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MS. MUNN: Right.

DR. ULSH: -- and therefore when you're left with this neutron source, combined with the fact that the dose rates are now down around the LOD and the fact that the background is not subtracted from neutron but is from gamma, that becomes a much more important factor.

MS. MUNN: Right.

DR. ULSH: So -- and SC&A's only --

MR. GRIFFON: This whole -- this whole operation was moved, though, wasn't it? And -- and is this -- this other source, was it the same afterwards? 'Cause I know they went through -- this is hard to discuss on the con-- you know, open conference call --

DR. ULSH: Yeah, I don't know the answer to that, Mark, that source.

MR. GRIFFON: Yeah.

DR. ULSH: I could probably find out the answer to that, but I don't know it right now.

DR. MAKHIJANI: The --

MR. GRIFFON: 'Cause it's not only the -- well, anyway, yeah. Yeah.

DR. MAKHIJANI: One of the issues here -- you

1 know, Ro-- Roger brought this up on our calls
2 more than once -- is that the initial
3 monitoring of Building 91 people was oriented
4 toward that special neutron source that I
5 believe Brant has just talked about, and -- and
6 -- and its NP ratio would be different than
7 during the other operation. Now if -- if -- if
8 the pit design was different and the -- the
9 con-- the people who were badged were not the
10 ones who were actually doing the assembly
11 operations, as I understood, at least initially
12 -- the badging was targeted towards people
13 handling the neutron source 'cause they were
14 concerned say about incidents in handling it
15 and -- and so forth, and -- and because of
16 that, we -- we don't -- I think even in
17 Building 91 you would not have data for the
18 early years unless there -- you get into the
19 job cards, and we certainly haven't done that.
20 Perhaps NIOSH has done that and sorted whether
21 there are say in '52, '53, '54 there are
22 workers who had assembly responsibilities who
23 had monitoring with the old type of pit.

24 **DR. ULSH:** Arjun, I didn't come away with our -
25 - from our conference call with that

1 distinction between the people handling the
2 neutron source and the final assembly. I came
3 away from it with the understanding that
4 handling of that neutron source was part of the
5 final assembly. Again, I --

6 **DR. MAKHIJANI:** Well, my --

7 **DR. ULSH:** -- would have to get --

8 **DR. MAKHIJANI:** -- my -- my feeling about who
9 was monitored were -- were people who were
10 handling -- that the monitoring was targeted
11 toward people who were handling that neutron
12 source --

13 **DR. ULSH:** I didn't get --

14 **DR. MAKHIJANI:** -- and that was the object of
15 the monitoring.

16 **DR. ULSH:** Well, I think --

17 **MS. MUNN:** That were a part of the production
18 process.

19 **DR. MAKHIJANI:** Yes, yes, so that once you
20 separate that out -- what -- all what I'm
21 saying is I'm not sure that you've got an
22 appropriate comparison basis because of how the
23 selection of the monitoring -- monitored
24 population was done in Building 91. It doesn't
25 seem to me that -- that we have that.

1 **DR. ULSH:** Well, I think -- yeah, I think it's
2 true -- I mean I just read Putzier's Memoirs
3 where he says that the neutron potential was
4 related to the handling of this equipment
5 rather than the handling of the plutonium. And
6 another thing to keep in mind here is that we
7 looked at the 1959 ratio in Building 91 and
8 it's 3.6, and compared to the earlier years,
9 the limited data that we have, it's 2.23, so it
10 suggests at least that -- I mean what you're
11 saying is true that the monitoring was focused
12 toward these people that handled the neutron
13 source, but I think it's claimant favorable to
14 do that because when you compare that to final
15 assembly operations you're talking about
16 plutonium metal, and for various reasons, you
17 don't really want a lot of neutrons around the
18 plutonium metal pit. Bad things tend to happen
19 when you get a lot of neutrons there.

20 **MS. MUNN:** Especially if -- again, this is a
21 refresher of what I think I -- I heard in
22 earlier discussions here. The neutron-to-
23 photon ratio -- the NP ratio in '59 was above
24 3.6 something, and from '52 to '58 it was -- or
25 was that '57/'58 it was 2.23 and then for the

1 longer period it was down to 1.8?

2 **DR. ULSH:** No, Wanda, let me clarify on that.

3 **MS. MUNN:** I -- I'm confused.

4 **DR. ULSH:** Okay. Let's talk about Building 91.

5 **MS. MUNN:** Right.

6 **DR. ULSH:** Starting -- the time period between
7 1952 and 1958, the observed NP ratio was 2.23,
8 and that's based on limited data.

9 **MS. MUNN:** Yeah, right.

10 **DR. ULSH:** In 1959 the observed ratio in
11 Building 91 was 3.6 --

12 **MS. MUNN:** 3.6.

13 **DR. ULSH:** -- and that has mostly to do with
14 (broken transmission) fact that both the
15 neutron and the gamma measurements came down to
16 right around the LOD.

17 **MS. MUNN:** Right.

18 **DR. ULSH:** That fact about background
19 subtraction becomes a much larger factor.

20 **MS. MUNN:** Yeah, got that.

21 **DR. ULSH:** That's not the same for Building 71.
22 You want me to talk about that?

23 **MS. MUNN:** Yes --

24 **DR. ULSH:** Okay.

25 **MS. MUNN:** -- would you please? Refresh me.

1 **DR. ULSH:** Building 71 you've got plutonium
2 coming in beginning in May of 1953.

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

4 **DR. ULSH:** All right?

5 **MS. MUNN:** So essentially for 71, '52 is not an
6 issue.

7 **DR. ULSH:** Well, I'll leave that to the working
8 group's discretion.

9 **MS. MUNN:** Well, in my mind (unintelligible) --

10 **DR. MAKHIJANI:** What was going on in 71 when --
11 when it started operations in '52?

12 **DR. ULSH:** Well, Arjun, it was built in 1952
13 and it became operational for plutonium in May
14 of 1953, so I'm -- you know, I can't really say
15 exactly what was going on. All I can say is
16 that the first plutonium came in --

17 **MS. MUNN:** They were probably installing
18 machinery. Anyway --

19 **DR. ULSH:** Well, yeah -- I don't know exactly.

20 **MS. MUNN:** Yeah.

21 **DR. ULSH:** Now Building 71, you've got starting
22 in May of '53, first plutonium comes in. They
23 -- the workers here are gamma monitored but not
24 neutron monitored.

25 Now as you go forward in time, you come up to

1 1956, you come up to 1957 and a lot of things
2 happened in 1957.

3 **MS. MUNN:** Right, you went over those.

4 **DR. ULSH:** Yes, and --

5 **MS. MUNN:** (Unintelligible) do that again.

6 **DR. ULSH:** Okay. Beginning in '57, you've got
7 some neutron monitoring, not much. Then in '58
8 when they resumed operations, you've got more
9 neutron monitoring and then more again in '59.
10 And what we observe here is that in those years
11 where we do have data -- a limited number in
12 '57, more in '58 -- the observed NP ratio is
13 1.31; as you move into 1959, the observed ratio
14 is 1.4, so it's --

15 **MS. MUNN:** Okay.

16 **DR. ULSH:** -- slightly claimant favorable.
17 Quite (unintelligible) favorable
18 (unintelligible) suggest.

19 **MS. MUNN:** All right, got it.

20 **DR. ULSH:** Okay.

21 **MS. MUNN:** That's better. Thanks. Sorry to
22 get you off on that repeat item.

23 **DR. ULSH:** All right.

24 **MR. GRIFFON:** Okay. I -- I mean I -- I think
25 we have this all -- you know, we've gone

1 through this. I would urge everybody on the
2 workgroup, we've got the minutes from the
3 technical call, too, that we just had and we
4 have the supplemental report from SC&A, and
5 along with these -- these transcripts that
6 Ray's going to turn around in a day -- Ray
7 can't answer to my joke -- but -- but I think I
8 -- I'd urge everyone to look at those 'cause
9 some of this is written up. It's a lot easier
10 to digest when you're looking at all of it in
11 writing rather than sharing it on the phone.
12 But is there anything else to clarify '52 to
13 '58 before we move on? I -- I think we've got
14 -- you know, the -- the way I'm looking at this
15 is let's get all the facts on the table and
16 then, you know, we can discuss them. May-- and
17 I think the workgroup may have to caucus
18 Wednesday night before the meeting with the
19 Board on Thursday. I think --

20 **MS. MUNN:** I think that's an excellent idea.

21 **MR. GRIFFON:** Mainly my purpose here is to get
22 all the facts out on the table and then -- then
23 sort of bring it back to the Board at that
24 point.

25 **MS. MUNN:** I don't see how we can avoid that.

1 **MR. GRIFFON:** Right, right. Anything to add,
2 Arjun or Brant, on that time period? And then
3 we can maybe move on to --

4 **DR. ULSH:** I have nothing further, Mark.

5 **MR. GRIFFON:** Okay.

6 **DR. MAKHIJANI:** No, I -- I don't, either.

7 **MR. GRIFFON:** All right. And --

8 **DR. MAKHIJANI:** Joe -- I don't know if Joe's on
9 the call as yet --

10 **MR. FITZGERALD:** Yes, I am, I'm --

11 **DR. MAKHIJANI:** Joe, are we --

12 **MR. FITZGERALD:** -- (unintelligible) cover
13 (unintelligible) background noise is --

14 **MR. GRIFFON:** Okay.

15 **MR. FITZGERALD:** -- (unintelligible) the
16 problem.

17 **DR. MAKHIJANI:** Joe, are we okay on -- on going
18 ahead?

19 **MR. FITZGERALD:** Yeah, I -- I think, you know,
20 between the documentation and what we've just
21 discussed, I think we've covered this in some
22 detail already.

23 **NEUTRON ISSUES, '59 THROUGH '70**

24 **MR. GRIFFON:** Yeah. All right, then '59
25 onward, Arjun, you --

1 **DR. MAKHIJANI:** Yeah, okay.

2 **MR. GRIFFON:** -- touched on that earlier, but I
3 think we should hit on it a little further.

4 **DR. MAKHIJANI:** Yeah, '59 on -- '59 onward, of
5 course there is more data and there are data
6 for -- for every building and there are neutron
7 and photon data for every building, so the --
8 so the issues are a little bit different --
9 quite a bit different. The -- the 1959 to 1964
10 period, there was more monitoring, but there
11 were still a lot of people who had neutron
12 exposure or at least in the NDRP who were not
13 monitored. That is, whose records indicate
14 that they have 100 percent notional doses. I
15 just wanted to say what the notional dose --
16 what the NDRP dose consists of.
17 It has four components, basically, two of them
18 relate to this notional dose and two of them
19 relate to the rereading of the badges. First -
20 - so the badges were recovered, as Brant has
21 pointed out -- it said at the NDRP about 87,000
22 badges were reread and 76,000 were matched
23 neutron gamma pairs -- in varying amounts for
24 each year, increasing into 1964 and '65. So a
25 lot of the badges were recovered and reread and

1 most of them were in pairs, but not all of them
2 were recovered and so for various years you
3 have varying numbers of workers, ranging from
4 one to 1,700, whose badges were not reread for
5 one reason or another -- not available,
6 couldn't be matched to the worker and so on.
7 So the NDRP added the reread dose, the cor--
8 assuming it's correct, for the moment -- to a
9 dose that was generally felt to be in error and
10 the rereading showed it to be in error, and the
11 amounts of errors varied over the years greatly
12 and by individual also greatly, and added --
13 added up was a -- a -- a dose that was known to
14 be in error to a dose that was corrected and
15 pres-- can be presumed, I think, to be in -- at
16 least as a first -- first cut, to be correct.
17 So you've got a problem of data integrity with
18 the NDRP in that an erroneous dose was added to
19 a correct dose.

20 Now NIOSH dose reconstruction doesn't
21 incorporate the part of the dose that couldn't
22 be reread directly, but adds a correction and
23 multiplies it by a correction factor, so we
24 checked the correction factor. And for that --
25 that's an issue with the rereading part.

1 For the '59 to '64 what is more relevant is the
2 notional dose, which is the dose calculated to
3 fill the gaps in neutron monitoring. They
4 could be small gaps, intra-year gaps, which
5 were filled by nearby doses from the worker's
6 own monitoring record, so if you had one-month
7 gap and two or three months around that had
8 monitoring data. Generally we -- we did not
9 find that to be questionable and -- and the
10 uncertainties around that are -- are limited,
11 and I think there's -- there's -- there's more
12 general agreement that that piece of the NDRP
13 in -- in filling the gaps is okay.
14 The piece of the NDRP that there has been a lot
15 of question about in our analysis is the -- is
16 the dose calculated from the NP ratio. We
17 looked at '59 to '64, and if you look at the
18 highest recalculated doses you find that in
19 many or most cases the higher end doses are
20 calculated doses rather than for monitored
21 workers. Now this doesn't mean that the actual
22 exposures were to workers that were not
23 monitored, because -- obviously we have
24 questions about -- about -- about the NP ratio.
25 Now if you look at Table 4, you'll see that in

1 our test, at least, the claimant favorability
2 of tests that we did -- admittedly not
3 statistically significant for any one year, but
4 overall we did look at 21 workers. We looked
5 at them randomly. It was just going through
6 and finding the first worker -- Ron, correct me
7 if I'm wrong here, you -- you did the selection
8 -- finding the first worker with more than six
9 months of neutron and gamma monitoring data.
10 And if you look at Table 4, the calculated dose
11 on the NP method is generally smaller than in -
12 - in most cases than the measured dose, and in
13 some cases it's much smaller, less than 50
14 percent of the measured dose. And so at least
15 this test indicates that in many or most cases
16 -- at least in many cases the NP ratio method
17 of calculating dose is not claimant favorable
18 and then not a best estimate. And for '59 to
19 '64 you've got a lot of people with indicated
20 high notional doses, which may not be claimant
21 favorable, which are higher than the monitored
22 population. Now -- so that's -- that's sort of
23 a particular issue with -- with the NDRP.
24 Now it's -- the problem is that -- of different
25 magnitude in different years. That's why in

1 our report we just gave you the scatter plots
2 of -- of percent notional dose and percent --
3 versus neutron dose for every year in that --
4 in that period, just so you could make your own
5 judgment about how significant it was in any --
6 any -- any one of those years.

7 Then there's a question of job types. You
8 know, we looked at -- we looked at whether a
9 building aggregation of NP ratio was
10 appropriate for calculating individual dose as
11 opposed to say the original -- the origin of
12 the NDRP, which was for epidemiologic study
13 calculations, and we have not done a complete
14 cluster analysis as yet. There just was not
15 time to do that. But to the extent that --
16 that we could see, there -- you know, there
17 were some worker doses that -- that were around
18 ten millirem per day in Building 71, for
19 example, and there were others that were only
20 around one to two millirem per day range, and
21 this is the av-- their annual average dose rate
22 in Building 71 for -- for different
23 individuals. So this indicates that -- that
24 aggregating -- aggregating workers and taking
25 the average of the neutron dose and the average

1 of the photon dose may not be ap-- appropriate
2 for calculating an individual's dose. And when
3 you put that together with the results of Table
4 4 or our analysis that I've just alluded to, it
5 -- it raises a lot of questions about that.
6 And in this period man-- many workers or most
7 workers are indicated, you know, to be at high
8 risk of neutron exposure who were not monitored
9 at all or not monitored the vast majority of
10 the time.

11 So those I think are the -- the date-specific
12 issues that -- that refer -- refer to that
13 period are the main points to me.

14 **MR. GRIFFON:** Okay. Brant, you want to --

15 **DR. ULSH:** Yeah, I'll say what I can, Mark.
16 Mutty and I --

17 **MR. GRIFFON:** Sure.

18 **DR. ULSH:** -- have been working pretty
19 feverishly on this this morning, and I'm
20 looking at Table 4 and I think we're certainly
21 in agreement with SC&A that this is not
22 statistically significant. I mean one worker
23 per year, when I believe in '59 -- and I'm
24 going to rely on Mutty to fill in the gaps here
25 for me. I believe there were like 2,000 people

1 -- Mutty, do you recall?

2 **MR. SHARFI:** In tot-- total that were monitored
3 in any given year and the number that had maybe
4 six months worth of data was probably around
5 100 in a given building year.

6 **DR. ULSH:** Okay, so we're in agreement with
7 SC&A that this is not statistically
8 significant.

9 I do have some other questions about this, and
10 again, I -- I don't have the backup data that
11 goes behind this table so I'm just going to try
12 to speak off the top of my head here, but this
13 table, Table 4, characterizes this as buildings
14 -- well, for instance, Building 71, notional
15 over measured. And so I'm assuming that SC&A
16 calculated the notional dose just as the NDRP
17 would. I'm looking at the paragraph ahead of
18 the table and it says that these workers were
19 selected with the restriction that the worker
20 have at least six months of paired neutron
21 gamma dose data. So as Arjun mentioned, there
22 are two terms that go into the notional dose
23 calculation, and it's weighted by what
24 percentage of that time a worker is neutron
25 monitored versus what percentage of the time

1 he's not. And the first term in the notional
2 dose is the worker's own neutron dose rate --
3 daily dose rate, and if she was worker -- she
4 was monitored as it says here in their
5 paragraph, that they were monitored at least
6 six months and at least half of the notional
7 dose would have come from that method, versus
8 the other term which is the part of the time
9 the worker was not monitored, to which you
10 would apply an NP ratio. So I'm assuming that
11 when you have the notional -- what's
12 characterized here as the notional doses in
13 Table 4, SC&A calculated those with the
14 appropriate weighting for the time the people
15 were monitored and to which you would apply the
16 daily dose rate.

17 **DR. MAKHIJANI:** No, no, Brant, I think you are
18 misunderstanding the purpose of this analysis.
19 No, that's not what this table is and I -- I've
20 obviously done a bad job of explaining it.

21 **UNIDENTIFIED:** Excuse me, (unintelligible) --

22 **DR. MAKHIJANI:** This table was to test the
23 neutron to photon method of calculating
24 notional doses and whether --

25 **DR. ULSH:** Arjun, is that the -- what you've

1 calculated in this table is not the notional
2 dose as it would be calculated by the NDRP
3 becau--

4 **DR. MAKHIJANI:** It is.

5 **DR. ULSH:** No, because what you've done is
6 you've selected people who were -- had at least
7 six months of paired neutron and gamma data.
8 Now if you take into account the population of
9 people who were neutron monitored, they were
10 the people thought to be at highest risk of
11 exposure. In other words, they would have most
12 likely the highest NP ratios. And that is why
13 the NDRP weighted the notional dose by the time
14 that they were monitored. So when you say that
15 these are notional doses as they would be
16 applied to these people, it's not. The NDRP --

17 **DR. MAKHIJANI:** I guess --

18 **DR. ULSH:** -- (unintelligible) that.

19 **DR. MAKHIJANI:** -- I still did not get through.
20 Mark, I -- I do not know whether the working
21 group understood what I'm trying to say is the
22 purpose of this analysis. It's simply to
23 calculate a notional dose for workers who were
24 monitored in order to test whether the method
25 is effective for workers who were not.

1 **MR. BUCHANAN:** Yeah, let -- let me add --

2 **DR. MAKHIJANI:** Maybe Ron can explain it better

3 --

4 **MR. GRIFFON:** Yeah, let Ron -- put Ron on.

5 **DR. MAKHIJANI:** -- (unintelligible) than I do.

6 **DR. WADE:** Can I just interrupt for a moment --

7 this is Lew. We're hearing noise -- dogs bark

8 and children cry and it's starting to become

9 distracting, so I -- I guess I'd ask you to

10 consider your situation and if that noise is

11 going on where you are, please take steps to --

12 to spare the rest of us. Thank you. Ron.

13 **MS. MUNN:** And before we go back to where we

14 were, can someone please repeat what page

15 number of the report this is on? I got lost in

16 bioassays.

17 **DR. MAKHIJANI:** Wanda, we're on page 34 --

18 **MS. MUNN:** Thank you.

19 **DR. MAKHIJANI:** -- of the report.

20 **MS. MUNN:** Thank you.

21 **DR. MAKHIJANI:** Sure.

22 **MR. GRIFFON:** Ron, why don't you take a crack

23 at explaining that. I follow it, but I was --

24 you know, I've looked at it pretty close so...

25 **MR. BUCHANAN:** Okay. Yes, the purpose of the

1 exercise was to say what if a person wasn't
2 monitored and we -- we didn't think he was
3 monitored and so we're going to apply notional
4 dose to his gamma dose, NP ratio to his gamma
5 dose to get a notional dose, and yet in his
6 back pocket he has a monitor so we could later
7 on compare that neutron dose to what we
8 calculate from his gamma dose. And so
9 essentially went in and looked at his gamma
10 dose and then looked at the NP ratio for that
11 year for that building, applied it to that
12 gamma dose and said oka-- he would have been
13 assigned say 1,000 millirem -- okay, he did
14 actually have a gamma mon-- a neutron monitor.
15 How does that compare to how we would have
16 assigned his dose, and that was the ratio. Say
17 he -- his neutron badge read 2,000 millirem,
18 then the ratio would come out 50 percent, and
19 so our intent was to just go in and pick
20 randomly the worker out of that year, that
21 building, and that had enough data because you
22 -- you're kind of caught here if you don't get
23 enough data, then you say well, it's not
24 statistically significant. If you get too much
25 data, well, then you say well, he was monitored

1 anyway. So I looked at something that had at
2 least six months to make it some reasonable
3 data and just say what would we assign him on
4 a, you know, NP ratio. Say he wasn't
5 monitored, he should have been monitored, he
6 wasn't; what would we assign him on his --
7 based on his gamma dose or the NP ratio that
8 year and then say how does that compare to what
9 he was -- actually received on his neutron
10 badge. That was the purpose of that, to see if
11 -- and -- and I would expect that some years it
12 would have alternated. Some years some workers
13 would have been covered completely, some of
14 them wouldn't. But in our case, you know, most
15 of them were -- were below what was actually
16 measured. That was the point of the exercise.
17 **DR. ULSH:** Okay, I understand a little -- I
18 mean I understand what you were doing there,
19 Ron. I contend, though, that you can't draw
20 any conclusions about the notional dose as it
21 would be applied in the NDRP because what --
22 what would have happened is, let's say you were
23 monitored for an exchange period, then you were
24 unmonitored, and then you were monitored again
25 so you've got a gap. The way that the NDRP

1 would have assigned that dose, it would have
2 been heavily weighted -- at least in the
3 population that you've selected -- by the
4 worker's own daily neutron dose, and that is
5 not reflected in this table --

6 **DR. MAKHIJANI:** But Brant, but this analysis is
7 not relevant for workers with -- who were
8 monitored most of the time. This analysis is
9 most relevant -- indicative for workers who
10 were not monitored most or all of the time.

11 **MR. BUCHANAN:** That's right, 'cause they would
12 have received the largest portion of their
13 notional dose from N over P ratio. Say we have
14 a worker out there should have been monitored,
15 he wasn't, what dose would we assigned him. We
16 would assigned him all -- or based on the N
17 over P ratio, or if he was just monitored for
18 several weeks or a month, most of the notional
19 dose would have been from N over P ratio. And
20 what I was -- I was looking at was how does
21 this measure up to if he'd actually had a badge
22 on him, how would that assigned dose match
23 (unintelligible).

24 **DR. MAKHIJANI:** Yeah, if -- if you go to Figure
25 10 maybe on page -- it might help to know which

1 workers we're talking about. It's on page 37.
2 It's -- it's the percent of notional dose
3 versus the actual neutron -- versus the final
4 neutron dose as calculated by NDRP. If you
5 look at the bo-- what -- the bottom set of
6 dots, which is zero percent of people who were
7 monitored all the time and -- and the set of
8 dots that's between say zero and 20 percent or
9 zero and 30 percent, tho-- or zero and 40
10 percent even, those are the people who were
11 monitored most of the time, about whose final
12 neutron dose in terms of filling the gaps we
13 don't have a lot of questions. We think that
14 that's okay unless, you know, a lot of badges
15 that couldn't be found. But the -- the -- the
16 workers that we're talking about that we have
17 concerns about are the ones toward the top of
18 the graph where it says 80 percent and 100
19 percent, these -- these workers would be in --
20 according to that analysis, may have received
21 assigned notional doses that are much less than
22 say if they had been actually monitored.
23 Now, you know, your -- you have to do it year
24 by year 'cause conditions were changing, but
25 overall the test of the method indicates not

1 adequate for -- for these people at the --
2 toward the top of the chart, but okay for
3 people toward the bottom of the chart.

4 **DR. ULSH:** Well, I don't know that we're going
5 to get a lot further than this other than -- I
6 mean my main -- I understand what you were
7 trying to do with this table. My concern is
8 that, by the nature of the selection that you
9 performed, the people who had at least six
10 months of paired neutron gamma data, those were
11 the people who were monitored because they were
12 thought to be at highest risk of neutron
13 exposure. So you cannot draw conclusions from
14 those people and compare it to the people who
15 were unmonitored for neutrons who were at lower
16 risk of neutron exposure, and --

17 **DR. MAKHIJANI:** But would the -- but they are
18 the ones who -- whose doses would determine the
19 NP ratio, so the NP ratio should obviously
20 apply to them because they were the monitored
21 ones.

22 **UNIDENTIFIED:** Anyway, yeah, that's
23 (unintelligible).

24 **DR. ULSH:** Okay. Well, like I said, there is
25 one more thing that I want to bring up here --

1 and Mutty, I'm going to rely on your for some
2 help here -- and that is the issue of missed
3 dose, because the data in Table 4 I believe --
4 an annual total. So for instance, five percent
5 in Building 71, 1959 --

6 **DR. MAKHIJANI:** Which -- which page are you on?

7 **DR. ULSH:** -- I can't -- this was -- that this
8 took any account of missed dose as it would be
9 applied in NIOSH dose reconstruction.

10 **DR. MAKHIJANI:** Which -- which -- which table
11 are you -- sorry.

12 **DR. ULSH:** Back on Table 4 still.

13 **DR. MAKHIJANI:** Page -- page 34?

14 **DR. ULSH:** Yes.

15 **DR. MAKHIJANI:** Of the new report?

16 **DR. ULSH:** I think so. Mutty, do you want to
17 talk --

18 **DR. MAKHIJANI:** Would you like to --

19 **DR. ULSH:** -- about that a little bit?

20 **MR. SHARFI:** We're -- we're probably confusing
21 two issues. There -- there -- there are later
22 tables, I think it's Table 5 and other -- Table
23 6, which used to be in the -- in the initial
24 pre-'52 report --

25 **DR. MAKHIJANI:** Yeah, I saw that comment from

1 you all. I realized that I wasn't explaining
2 things right. I just dropped that table with
3 the zeroes 'cause I realized it was just
4 confusing the issue and it is no longer in this
5 report.

6 **DR. ULSH:** Oh, okay. The final piece is, when
7 you're talking about people who were monitored
8 at least six months out of the year for
9 neutrons, I -- it's safe to say that we would
10 be assigning 95 percent -- I mean these would
11 be the people who would be at the 95 percent
12 confidence limit, I mean, and the NDRP does
13 provide 95 percent upper bound doses. So I
14 don't know that the uncertainty was taken into
15 account here.

16 **DR. MAKHIJANI:** Yes, actually that was a piece
17 that I did not mention in -- in -- in going
18 through the list is there is a discussion in
19 the report -- I don't remember the pages
20 anymore -- about -- about the NDRP model
21 itself, is that the NDRP -- the N over P model
22 assumes a proportionality between the gamma
23 dose and the neutron dose, and assumes that the
24 neutron dose is zero when the gamma dose is
25 zero because that -- that -- that's the nature

1 of the equation that's used. If you go to page
2 32 of the report, this is just one of the
3 graphs and most of the graphs that I did came
4 out this way. I didn't present them all
5 because it just clutters the report, but this
6 is fairly typical. It -- it plots -- it plots
7 the paired data, measured -- measured data,
8 neutron and gamma dose, and -- and the pink
9 dots are -- are -- are linear regression line -
10 - you see that there is a -- a Y-axis intercept
11 with a 100-odd millirem of -- for -- for that
12 regression line. The correlation isn't very
13 good, actually; it's quite poor. But to the
14 extent that there's a correlation, the -- the -
15 - there is an intercept. And in the -- in the
16 model that has been adopted, the -- the N--
17 these are measured data, so in the model that
18 was adopted for notional doses doesn't reflect
19 the characteristics of the measured data
20 because it does not have a Y-axis intercept.
21 The difficulty with this Y-axis intercept is it
22 really changes from one year to the next
23 because the conditions of work were changing,
24 the way the assembly line operated was changing
25 and so on, the number of workers who were

1 badged was changing. And the -- the strict
2 proportionality with -- with a dose going
3 through the origin does not apply to the actual
4 data, but it's the way the notional dose model
5 was set up for the NP ratios. And in that kind
6 of context, I think the selection of the model
7 raises a question in our minds as to whether
8 the -- the variance means anything at all
9 because that model does not reflect the
10 measured data.

11 **DR. NETON:** Arjun, this is Jim. I -- I think -
12 - I might have a misunderstanding here 'cause I
13 have not looked at this as thoroughly as Brant,
14 but I thought that the uncertainty in the model
15 was determined empirically based on the
16 observed difference between the predicted minus
17 the actual measured data in the workers that --
18 the paired data. That is really the overall
19 variance of the model.

20 **DR. MAKHIJANI:** If the variance is calculated
21 based on the paired data but the overall model
22 is forced to go through the origin, in that the
23 expected values of the errors -- if you do
24 neutron dose equal to NP ratio multiplied by
25 gamma dose plus an error, which would be

1 essentially the -- the Y-axis intercept, that
2 error is forced to be zero.

3 **MR. SHARFI:** Actually it's not, because this
4 doesn't account for missed dose. The missed
5 dose then would be our error. As the gamma
6 dose goes to zero, then we assign missed dose -
7 -

8 **DR. MAKHIJANI:** No, no, no, we're not talking
9 about -- we're not talking about how you do
10 dose reconstruction and whether you assign
11 missed dose or not. We're just talking about
12 whether the -- whether the characteristics of
13 the model reflect the characteristics of the
14 data, so that the -- what the variance might or
15 might not mean.

16 **MR. SHARFI:** Well, that's my point. By -- by
17 shifting this to a forced zero, what you do is
18 you increase the slope of this curve, the
19 neutron linear curve, and that gives you a
20 higher NP ratio --

21 **DR. MAKHIJANI:** Yes, but you underestimate
22 (unintelligible) --

23 **MR. SHARFI:** -- which (unintelligible) --

24 **DR. MAKHIJANI:** -- lower for the -- when you
25 have lower measurements -- you have different

1 effects at different dose ranges, so that in
2 some dose ranges you have a claimant-favorable
3 effect and in other dose ranges you have the
4 reverse. You are not claimant favorable.

5 **DR. NETON:** I -- I think it's probably a little
6 too complicated to flesh out here in some
7 detail, but I think Mutty's right in the sense
8 that how we apply the model in dose
9 reconstruction is -- really is germane. I mean
10 the model, if it's forced to be zero, you apply
11 that and then as you get down towards mi-- the
12 lower doses, the missed doses apply. And I
13 think at the end of the day the analysis will
14 show that we are fairly claimant favorable.

15 **DR. MAKHIJANI:** But you never apply the 95
16 percentile.

17 **DR. NETON:** Well, it's in there. It is applied
18 at the distribution about the val-- the central
19 value. That is applied in -- in the best
20 estimate cases, that's true. For -- for cases
21 -- isn't that right?

22 **DR. MAKHIJANI:** You never apply 95 percentile
23 as a fixed value, so far as I understand.

24 **DR. NETON:** Well, we do on the overestimates, I
25 thought.

1 **MR. SHARFI:** We apply the distribution, not as
2 a fixed value.

3 **DR. NETON:** We apply a central estimate plus
4 the distribution of the values.

5 **DR. ULSH:** And then for an underestimate we
6 take the 90-- I'm sorry, for an overestimating,
7 we take the 95th.

8 **DR. NETON:** The 95th percentile is for an
9 overestimate, and then it's a distribution for
10 a best estimate.

11 **DR. MAKHIJANI:** Mutty, do you apply the 95
12 percentile fixed values for an overestimate?

13 **MR. SHARFI:** There is a -- a -- I think we're
14 referring to is the uncertainty factor that's
15 applied -- (broken transmission) -- uncertainty
16 factor that can be multiplied into these doses.

17 **DR. MAKHIJANI:** Yeah. The -- the effect of
18 applying a normal distribution in a dose
19 calculation with -- with a -- with the -- with
20 the standard deviation is that the net effect
21 is that you're really applying the
22 (unintelligible).

23 **DR. NETON:** Well, that depends on how large
24 that -- that uncertainty is. We've been
25 through this before many times, but the fact

1 that that exists means that we do know some
2 upper bound estimate of the overall certainty
3 model that could be applied. You know, I think
4 it's a fairly good empirical determination of
5 the overall uncertainty model. You take it and
6 apply it to the measured data and what is the
7 overall variance of the model. That's a
8 standard statistical technique.

9 **MR. GRIFFON:** That -- that is a distinct point
10 you're making, Jim, that the fact that that
11 exists in the database is (unintelligible),
12 even -- even if you're not using it, you may
13 choose to go that route. Is that what you're
14 saying?

15 **DR. NETON:** Yeah, that's what I'm saying. I
16 mean I'm not committing to that --

17 **MR. GRIFFON:** Right, right, right.

18 **DR. NETON:** -- but that -- those -- those data
19 do exist and it really is the overall variance
20 of the model itself.

21 **MR. SHARFI:** And I -- I think if you also run
22 this Table 4 for some of the higher exposed
23 workers (unintelligible) random selection of a
24 small number, but you pick the higher numbers,
25 we (unintelligible) that the NP ratios do

1 actually bound the (unintelligible) for '59 to
2 '69 the NP ratios do actually bound the higher
3 dose (unintelligible) --

4 **DR. MAKHIJANI:** If you pick the --

5 **MR. SHARFI:** -- (unintelligible).

6 **DR. MAKHIJANI:** -- if you pick people who were
7 monitored most of the time that you would be
8 automatically getting the higher exposed
9 workers. Is that -- is that not -- that -- I
10 thought that's what Brant said.

11 **MR. SHARFI:** Well, I'm saying if you purposely
12 go to the top end, the most -- the highest
13 exposed workers, if you pick the top 20 people
14 that were exposed, and you look at applying the
15 NP ratio to them, and then looking what their
16 notional -- what their measured (broken
17 transmission) -- the notional (broken
18 transmission) -- the notional dose, then
19 looking at their measured (broken transmission)
20 -- I mean we find that -- that that still
21 (broken transmission) -- in -- in how you
22 created your Table 4, but if you're looking at
23 the top dose people, that the NP ratios do
24 apply. It's hard -- it's hard when you start
25 just randomly picking any -- any person within

1 the subset because there are a lot of people
2 with zeroes, and (unintelligible) --

3 **DR. MAKHIJANI:** No, no, we picked people who
4 were monitored most of the time.

5 **MR. SHARFI:** Well, but just because they're
6 monitored doesn't mean they don't have (broken
7 transmission) doses that (broken transmission)
8 the LODs.

9 **MR. BUCHANAN:** Well, no, I --

10 **MR. SHARFI:** So you're getting into issues of -
11 -

12 **DR. MAKHIJANI:** Ron, do you -- you -- you -- I
13 have -- we have -- we have the detailed data,
14 and Ron, you know them well.

15 **MR. BUCHANAN:** Right, I -- I -- I tried not to
16 pick things that -- first of all, I looked to
17 see if they had a reasonable amount of data,
18 and then I tried to not -- not to pick any ones
19 that had a lot of ones, where there were ones
20 instead of zeroes, which means the gamma dose
21 was -- was below the detectable limit and --
22 and have a high neutron dose 'cause that
23 wouldn't be fair. I mean I wasn't -- I was
24 trying to -- to not be biased on what I did
25 pick, although it wasn't a great number --

1 statistically valid number, I was trying to
2 pick ones that would give us an answer that was
3 -- was representative. And so I did -- I -- I
4 tried not to pick ones that were very low gamma
5 doses. If I picked on that looked like it was
6 right amount of monitoring time but they had
7 all ones in the gamma dose, I didn't use that
8 one. I us-- now, again, I didn't go through
9 all of them and -- and hand-pick them, but I
10 did not -- I tried to eliminate extremes.

11 **MR. SHARFI:** Well, I have tried to
12 (unintelligible) the largest (unintelligible),
13 people with the largest neutron doses and then
14 -- then look at their gamma doses, and if you
15 look at their gamma to neutron ratios, they are
16 well within the -- the NP bounds.

17 (Unintelligible) to the middle and lower
18 people, that -- and these -- these tables don't
19 show, if there's underestimate, the -- the
20 amount of dose that's underestimated, whether
21 or not that would be captured with the missed
22 dose, and that's adding -- maybe that's what
23 Brant was talking about earlier is -- is if you
24 start getting into the people with low doses,
25 there is a missed dose component that has to be

1 considered. You have to -- have to look at
2 only the people that have high recorded doses
3 in this comparison in every cycle period,
4 otherwise you're missing a component that would
5 be assigned as part of the (unintelligible).

6 **DR. MAKHIJANI:** No, we're -- we're -- I think
7 there is still a misunderstanding about what
8 the purpose of Table 4 is, and -- and I guess
9 Mark, you know it pretty well so maybe -- maybe
10 you can take over from here --

11 **MR. GRIFFON:** Well, actually I was --

12 **DR. MAKHIJANI:** -- (unintelligible) many
13 iterations of trying to say what this table is
14 designed to do.

15 **MR. GRIFFON:** Yeah, I don't know if there's a
16 misunderstanding, but what I was almost -- I
17 think it's almost time to step back and say,
18 you know, for this time period -- I -- I was
19 going to try to summarize. For this time
20 period I think I -- from my read on this,
21 anyway, and this is just me individually, but
22 my take is that we have -- we have less issues
23 than in the first time period that we were just
24 discussing, but we still have some significant
25 questions on the table, you know, and I'll

1 summarize those. I mean in a very simple
2 fashion.

3 I'm not going to get into the detail that it
4 was just discussed, but number one, the -- the
5 highest exposed individuals were -- were not
6 monitored for neutron exposures, at least up
7 through '64. We still have that question of
8 the highest exposed not -- not being measured
9 dose but -- but 100 percent notional on several
10 of those years. It goes aw-- it seems to go
11 away, as Roger Falk had said, in 1964/'65 where
12 you start to see almost all the higher total
13 neutron doses are from measured dose -- from
14 people that were measured. So that's one
15 factor.

16 Number two is -- is -- and I think this is
17 still significant in this time period, that you
18 have -- seems to me you have a -- a large
19 variation, or at least a fair variation,
20 between individuals as opposed to sort of the
21 building level, doses and NP ratios. So you
22 know, the question is, you know, the NDRP
23 project was -- was -- did everything on a
24 building level and I'm not -- I'm not saying
25 that that was a mistake, you know. For their

1 purposes it certainly was -- was the right way
2 to go. But for our purpose I think, you know,
3 we have to question whether we can calculate
4 doses for all workers in all areas. So then
5 there's a question if there's a very large
6 variation, are we missing someone. Now that's
7 why I -- I sort of jumped in on Jim's point,
8 that there is some information here about the
9 95th percentile, and we can dispute how that
10 was calculated and all -- all the details of
11 that, but there may be -- there may be some way
12 to -- to still sort of look at bounding that
13 group, even if -- you know, assuming we don't -
14 - you know, assuming it's determined that this
15 current approach isn't -- isn't satisfactory.
16 And then I guess the last point for this time
17 period, at least in my read of this, was the
18 question of the non-reread doses, and there's -
19 - there's -- basically this is a -- a question
20 of where -- where the person was monitored,
21 but, for whatever reason, a certain film meter
22 -- it couldn't be recovered or it was damaged
23 or whatever, they couldn't reread that
24 particular film for that cycle and so they left
25 the non-reread dose in the NDRP and it's my

1 understanding that that was just added into the
2 person's overall dose in-- instead of
3 recalculating that cycle using a notional
4 approach, they just added in that non-reread
5 portion, which -- which may certainly -- it --
6 it -- it appears always to be lower than the --
7 the notional doses --

8 **MR. BUCHANAN:** Mark, I'd like --

9 **MR. GRIFFON:** -- so there's a que-- go ahead.

10 **MR. BUCHANAN:** A clarification here.

11 **MR. GRIFFON:** Clarify that for me, Ron. Thank
12 you.

13 **MR. BUCHANAN:** Yeah, they do -- I do want to
14 say on NIOSH's part, they do -- in dose
15 reconstruction they do take that original non-
16 reread dose and multiply it by 2.5 or --

17 **DR. MAKHIJANI:** No, 1.99 and 1.13.

18 **MR. GRIFFON:** Okay.

19 **MR. SHARFI:** And the 2.5 does apply for pre-'63
20 for (unintelligible) are applied to the
21 original (unintelligible).

22 **MR. GRIFFON:** The pre-'63, right, so that --
23 you have correction factors, I should -- I
24 didn't get to that, but --

25 **MR. SHARFI:** Yeah, 'cause that's not included

1 in this report.

2 **MR. GRIFFON:** But that was -- that's not in the
3 NDRP. Those correction factors are in NIOSH's
4 approach. Right?

5 **MR. SHARFI:** Correct.

6 **MR. GRIFFON:** Beyond -- yes, yes, so -- so --
7 you know, so those -- those three factors still
8 exist. I think also, if I remember correctly,
9 and -- and Brant or others may refresh my
10 memory on this, but I think in '59 through '64
11 -- I mean the big push, you know, of -- of sort
12 of benchmark data from the time period, I think
13 you have more information sort of to validate
14 these ratios during this time period, don't
15 you, or -- or am I mistaken?

16 **DR. ULSH:** Well, Mark, if -- if you're talking
17 about actual measured neutron doses, we've
18 certainly got more in '59. If you're talking
19 about field survey data, I don't really know
20 the answer to that.

21 **MR. GRIFFON:** Yeah, I was talking about the --
22 the latter, actually.

23 **DR. ULSH:** Field survey data?

24 **MR. GRIFFON:** Yeah, sort of those independent
25 benchmarks that we were talking about, and I

1 thought that it was mentioned. Am I wrong,
2 Arjun? Was that --

3 **DR. MAKHIJANI:** No, Roger did mention field
4 survey data, but he said that they were not
5 archived, if I remember -- Roger's not on this
6 call, is he?

7 **DR. ULSH:** No, he -- I don't think so.

8 **DR. MAKHIJANI:** Yeah, okay.

9 **MR. GRIFFON:** So anyway, I --

10 **DR. MAKHIJANI:** It is -- it is in the minutes
11 of the calls. I can check, but --

12 **MR. BUCHANAN:** That's what he said. He said
13 that it was done, but he -- you know, no
14 documentation that existed to verify that.

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

16 **MR. GRIFFON:** Okay. So I guess my -- my
17 biggest concern for this time period would be,
18 you know, the fact that -- that we have a --
19 several -- a lengthy time period where you
20 still have the highest final neutron doses
21 basically being full notional doses. In other
22 words, the -- the people had 100 percent
23 notional dose and they were the highest total
24 neutron doses in the database for that year,
25 and the second being that that variation -- and

1 if you look at the individual doses or
2 individual NP ratios, to the extent you can
3 look at individual NP ratios, but you see a
4 large -- a large variation in -- within each
5 building, which was -- which makes you question
6 whether you just use the straight sort of
7 average to calculate everyone's dose or you
8 (unintelligible) sort of upper -- upper, you
9 know, 95th percentile or something like that.
10 And I think that in this case, in this time
11 period, actually there might be the data there
12 to be able to do that kind of approach, so --
13 that -- that's my read on this and maybe I'm in
14 a different place than everyone else, but
15 that's -- I just wanted to try to step back and
16 frame the issues that way.

17 **MS. MUNN:** The bottom line here is, regardless
18 of the details which we have worked in
19 enormous, finite context, the only question
20 that exists for the working group is whether
21 there is adequate data to do a decent job of
22 dose reconstruction. We have lots of
23 individual data. We have capability of doing
24 bounding calculations --

25 **MR. GRIFFON:** You're speaking to this time

1 period, right, Wanda?

2 **MS. MUNN:** Yes, I'm speaking to this time
3 period --

4 **MR. GRIFFON:** Yeah.

5 **MS. MUNN:** -- (unintelligible), I see no reason
6 why we continue to work these details. We have
7 the data we need to fulfill the charter of this
8 group.

9 **MR. GRIFFON:** Yeah, I -- I think -- you know,
10 and I think, unless there's any more evidence
11 to put forward, I think, you know, Wanda's -- I
12 don't know how much more we can discuss these
13 details. I think we might have enough to --
14 and it -- and it's a weight of the evidence
15 question and I think, you know, that they --
16 this -- this time period, that's why we sort of
17 -- that's why we've been discussing these in
18 these sort of time frames that we have is
19 because there -- there are or there were
20 drastic differences and there were -- there's a
21 lot more measured data, and especially as you
22 get out to '64 and '65, there's -- it's very
23 clear that what Roger Falk indicated is true,
24 that the highest exposed are clearly monitored
25 from then on, you know, so I think there is a

1 lot more data. I still think that -- that some
2 of these -- some of these, you know,
3 deficiencies do exist, but they might not be
4 insurmountable in this time period. That's
5 sort of my -- where I'm at with this and I'd
6 just ask if Brant or Arjun could say any final
7 sort of evidence or facts to make sure we go on
8 the right route and then we can close this one
9 out.

10 **DR. MAKHIJANI:** Yeah, Mar-- Mark, if you look
11 at -- and Wanda, if you look at page 42, the
12 figure there will show you -- you know, Roger
13 Falk indicated it was sometime in the mid-'60s
14 or -- you'll see that clearly mid-- '65 is very
15 different from '64, and that really all of the
16 highest measured doses are -- are -- are along
17 the zero percent line -- I mean highest final
18 doses are along the zero percent line. That is
19 (unintelligible) measured and -- and the zero
20 to 20 percent range is very heavily populated,
21 so -- including for those people who have high
22 final doses, so in-- for '65 and I think
23 subsequent years, although I don't have the
24 charts for all of them, the -- this would be
25 true. I'm not sure about '69/'70 'cause there

1 you have the problem of what -- what films were
2 archived, but this -- this is sort of more
3 characteristic and so in this period certainly
4 you have an indication that the most exposed
5 peo-- people were monitored and more people
6 were monitored and so on.

7 **DR. NETON:** I -- I think --

8 **DR. MAKHIJANI:** And very little of the total
9 final dose is notional dose.

10 **MR. GRIFFON:** Jim, was that you?

11 **DR. NETON:** Yeah, I was just going to make a
12 comment or an observation that I'd remind
13 everyone that when we use coworker data and
14 assign the 95th percentile of the distribution
15 to unmonitored workers, we assign more dose to
16 those workers than 95 percent of the monitored
17 workers. I'm not sure what the argument is
18 that the notional dose provides more dose. I
19 mean it -- it's the same -- same kind of logic,
20 if --

21 **DR. MAKHIJANI:** No, the -- the argument here,
22 Jim, is that when we checked for whether
23 notional dose was even the best estimate, we --
24 we did not check out to the extent that -- to
25 that -- to the extent that our analysis went,

1 anyway.

2 **MR. GRIFFON:** It's a limited sample and I think
3 we've been over this ground enough.

4 **DR. MAKHIJANI:** Yeah, right.

5 **DR. NETON:** I wasn't talking about the Table 4
6 values. I was just saying that, you know, this
7 -- this idea that 100 per-- you know, many --
8 that most of the workers -- many of the workers
9 have 100 percent notional dose --

10 **MR. GRIFFON:** Right.

11 **DR. NETON:** -- is not inconsistent with the
12 approach that we -- was adopted for coworker
13 models --

14 **MR. GRIFFON:** The only point there, Jim, was
15 that we were pointing out that, you know, the -
16 - the hi-- the normal sense would be that the
17 highest exposed were monitored, and these --
18 these indicate that they -- they were kind of
19 catching up with that, you know, as the years
20 went on. These are estimated doses rather than
21 measured doses for the -- still up through '64.

22 **DR. ULSH:** Mark, I -- I've only got one thing
23 to say --

24 **MR. GRIFFON:** Okay, okay.

25 **DR. ULSH:** -- and that is that when you say

1 that the highest exposed people were not
2 monitored, that's based on the notional doses
3 as calculated by NDRP, and I think there's a
4 bit of circular reasoning here. In order to
5 draw that conclusion you have to rely on the
6 NDRP notional dose calculations, which SC&A at
7 least has said that they're not convinced is
8 valid, so there's a bit of circular reasoning
9 there. And --

10 **MR. SHARFI:** I'd like to com--

11 **MR. GRIFFON:** Well, yeah, and you could -- you
12 -- yeah, you could --

13 **MR. SHARFI:** People with the highest gamma
14 exposure possibly (unintelligible) were not
15 monitored for neutron.

16 **MR. GRIFFON:** I -- I didn't catch that.

17 **MR. SHARFI:** I said in the earlier years all
18 you can argue is the people with the high--
19 some of the highest gamma doses were not
20 monitored for neutron. That doesn't mean they
21 had the highest neutron potential. But by
22 assigning them an NP ratio, that gives them the
23 highest neutron dose.

24 **MR. GRIFFON:** So you're -- you're saying that
25 these no-- these NP ratios -- I mean it --

1 there could be circular reasoning on both sides
2 of this, Brant. I -- we can go around in
3 circles both ways 'cause -- are you saying that
4 the -- I mean I -- I was under the
5 understanding that the -- and -- and they
6 stated in the report that these are the best
7 estimates. They weren't -- these weren't
8 overly conservative estimates that they were
9 making when assigning notional doses. These
10 were the best estimates.

11 **DR. ULSH:** We might be getting tripped up on
12 semantics --

13 **MR. GRIFFON:** Yeah.

14 **DR. ULSH:** -- (unintelligible) best estimates,
15 however that best estimates includes --

16 **MR. GRIFFON:** Some conservatism in it or
17 whatever.

18 **DR. ULSH:** Exactly, and I would agree that
19 people -- some of the people who had the
20 highest neutron doses were not monitored. But
21 that's based on my confidence in the NDRP
22 notional doses. If you don't have that
23 confidence in the NDRP notional doses, you
24 can't really draw any conclusion about whether
25 the highest neutron-exposed people were

1 monitored or not.

2 **DR. MAKHIJANI:** Well, the -- actually that --
3 that -- that last piece is not quite right in
4 the sense that's what the Table 4 analysis is
5 all about and we can certainly do a few more,
6 but -- or NIOSH can do a few more, but the
7 Table 4 analysis was designed to compare
8 whether the notional dose is a reasonable best
9 estimate or claimant favorable estimate or
10 upper limit estimate or really an
11 underestimate, and in most cases it's indicated
12 to be an underestimate. And so actually when
13 you have high -- the highest values being
14 notional doses, by that yardstick you would say
15 that really the actual doses of the people who
16 were not monitored would -- may even be higher
17 than that, in many cases, because the notional
18 dose is indicated to be not a best estimate or
19 a good estimate in many cases.

20 **DR. ULSH:** Okay. Well, I don't want to go back
21 to Table 4. We've already stated our objection
22 to that.

23 **DR. MAKHIJANI:** Yeah.

24 **MR. GRIFFON:** Right.

25 **DR. ULSH:** Jim, do you have anything?

1 **DR. NETON:** No, I -- I don't.

2 **MR. GRIFFON:** Yeah, I think we have enough
3 information on the table that we --

4 **DR. ULSH:** Yeah, Mark, I think the defense
5 rests.

6 **MR. GRIFFON:** Yeah, we can try to sort this
7 out. I mean I -- I don't -- and I think it is
8 -- I think everybody -- we can agree on one
9 thing, that the -- I think the characteristics
10 are different from '59 forward and that, you
11 know, there -- there -- there's more data there
12 so I think we have to consider that differently
13 than the first period, for sure.
14 Why don't we move off of neutrons and on to the
15 next topic.

16 **DR. MAKHIJANI:** Mark, did you want something on
17 the non-reread badge portion for '69 and '70,
18 which is the latest piece of the analysis that
19 we have not discussed in any working group.

20 **MR. GRIFFON:** Yeah, might -- might as well
21 quickly, Arjun, I guess we need to -- yeah.

22 **DR. MAKHIJANI:** We -- we actually looked at the
23 correction factors that are applied to the non-
24 reread doses by NIOSH since they did say, quite
25 -- quite rightly, that they're not using the

1 non-reread portion, the badges that -- that
2 were not reread. If you go to Table 7 on page
3 49 you'll see this particularly affects some
4 years. We analyzed '59, '65 and '69, and did a
5 preliminary analysis of 1970. We found that
6 NIOSH uses -- quite apart from the compensation
7 for the fact that the energy neutrons are not
8 being ful-- fully picked up, the full energy
9 spectrum is not picked up by the NTA film for -
10 - for which a compensating factor is used. The
11 compensating factor or correction factors that
12 apply strictly to this are about two -- or
13 1.13, depending on the building, and we
14 calculated -- for the individuals -- for all
15 the individuals in 1959, for instance, which
16 are the shortest tables so it's presented here,
17 Table 8 on page 50, you'll see that, for
18 individuals who had a portion of their dose
19 that was not reread, that the reread portion
20 you had errors of a factor of 1.56 to a factor
21 of six-- more than 16. And for 1969 that
22 result was -- and a ratio -- the correction
23 factor was from .5 to 220, which is that the
24 original dose was more than reread dose, an
25 underestimate by a factor of 220. And so we

1 found actually the range of corrections that
2 were being made to the original reading was
3 very huge. And in 1969 and 1970 they were not
4 correlated, the ratios were not correlated with
5 either the corrected dose or the original dose.
6 So it doesn't seem that there's any good way --
7 at least that was evident to us -- to pick a
8 correction factor. And in all cases that we
9 examined, NIOSH's correction factor was not
10 claimant favorable.

11 **MR. GRIFFON:** So this is -- I don't know if
12 Brant's had a chance to review this issue, but
13 --

14 **DR. ULSH:** No, I really haven't --

15 **MR. GRIFFON:** Right, right, right.

16 **DR. ULSH:** -- Mutty, have you?

17 **MR. SHARFI:** Just -- just --

18 **MR. GRIFFON:** This is a question of that 1.99
19 factor -- correct? -- or...

20 **DR. MAKHIJANI:** Yes.

21 **MR. GRIFFON:** Yeah.

22 **MR. SHARFI:** These -- these are -- I will say
23 that we're still -- an analysis of summary
24 data, not cycle data. Now I -- I really, you
25 know, give people caution to use these summary

1 data, not some ratios, until you break these
2 stuff down to cycle data because a lot of these
3 total doses that you see are a lot of zeroes
4 with only a single 20 millirem that then 20
5 zeroes get compiled into a summary 20, and then
6 when they recalculate 20 different cycles, you
7 see a large -- you see a large reread dose and
8 it makes it look like there's a very high
9 ratio. When it regards to actually a very low
10 ratio there is a lot of cycle data that is
11 included in these, so there's not a very big
12 different in individual cycles but in an
13 overall dose 'cause you're looking at summary
14 data.

15 And when we've done these analysis and gone
16 back to the cycle data, you do not see these
17 factors of ten, 20, 100. You -- you -- you --
18 they're very close to what -- what we use in
19 the -- in the actual --

20 **MR. GRIFFON:** Mutty --

21 **MR. SHARFI:** -- dose reconstruction process.

22 **MR. GRIFFON:** Mutty, do you have the backup --
23 you said you've done this analysis. Do you
24 have that analysis that supports your selection
25 of the 1.99 or whatever value that's stated --

1 **MR. SHARFI:** I think Brant --

2 **MR. GRIFFON:** -- in the TIB?

3 **MR. SHARFI:** -- (unintelligible) when we had
4 relooked at -- 'cause this is with a table --
5 this is actually the same table that has been
6 sent to us, I thought before the supplement.

7 **DR. MAKHIJANI:** No, it is not. It is new.

8 **MR. SHARFI:** It's the same process that was
9 used in their Table 6, which is the exact table
10 that was sent to us. It's just expanded to '69
11 to '70.

12 **MR. GRIFFON:** Well, I -- I'm not asking about
13 their tables. I'm asking if you have what
14 you've done, your analysis, to support your
15 selection of the 1.99 correction factor --

16 **MR. SHARFI:** What I have is --

17 **MR. GRIFFON:** -- from the (unintelligible).

18 **MR. SHARFI:** -- I have -- I don't want -- I
19 have to look -- what Brant has already sent
20 over. I mean -- but I believe that does go all
21 the way to '69 is what we looked at.

22 **MR. GRIFFON:** I mean if that -- maybe if that
23 could be provided, then we -- as a workgroup, I
24 think -- at this point I think we're just going
25 to have to compare that, look at the -- look at

1 SC&A's supplemental report, compare how NIOSH
2 derives the 1.99 value and -- and -- you know,
3 put that on the table.

4 **DR. ULSH:** Yeah, and Mark, I -- I sent over a
5 report on Thursday, but I don't know if it
6 contained that, so much has been going back and
7 forth.

8 **MR. GRIFFON:** Yeah.

9 **DR. ULSH:** I'll look and see whether or not I
10 have sent over what Mutty's talking about.

11 **MR. SHARFI:** Brant, we might have just sent to
12 '66. We did the calculations all the way
13 through, but sent the original -- Arjun might
14 be right since the original table only went to
15 '66, we might have only included a response --

16 **MR. GRIFFON:** So that might be in your response
17 document then, okay.

18 **DR. ULSH:** It might be, I don't know. I -- I
19 can't remember.

20 **MR. GRIFFON:** All right, all right.

21 **DR. MAKHIJANI:** I -- I didn't see any
22 calculations in the response document, but I
23 didn't look at it very carefully.

24 **MR. GRIFFON:** Okay, okay. Maybe I can just ask
25 if -- and this is -- we're in the final throes

1 of this, but if -- if there is something else
2 that you can add, just -- you know, that --
3 that would help us determine -- to compare that
4 1.99 value versus what Arjun -- what the SC&A
5 report says.

6 **DR. ULSH:** If we -- if we end before 4:00
7 o'clock today, Mark, Mutty and I will put our
8 heads together --

9 **MR. GRIFFON:** Okay, we -- we will --

10 **DR. ULSH:** -- and see.

11 **MR. GRIFFON:** -- end before 4:00 o'clock 'cause
12 my mouth's starting to throb, so --

13 **MR. BUCHANAN:** Okay, this is Ron. Let me just
14 clarify that last --

15 **MR. GRIFFON:** Okay.

16 **MR. BUCHANAN:** -- what you requested, Mark.
17 That's pertaining to OTIB-27, Table 4.1 where
18 it lists for 1951 to 1963 it lists the film
19 rereading bias as 1.99 for Building 771, all
20 other buildings 1.13, and then it lists the
21 same value for 1964 to 1970. We would like to
22 see --

23 **MR. GRIFFON:** Yeah.

24 **MR. BUCHANAN:** -- where the 1.99 and the 1.13 -
25 - how those were derived --

1 **MR. GRIFFON:** How they were derived.

2 **MR. BUCHANAN:** -- and what database they was
3 taken from.

4 **MR. GRIFFON:** Yeah.

5 **DR. ULSH:** All right, Matt and Mutty, make a
6 note of that, and we're going to be moving off
7 of the neutron issue here --

8 **MR. GRIFFON:** Yep.

9 **DR. ULSH:** -- so perhaps you can start thinking
10 about that, but don't go too far away.

11 **MR. GRIFFON:** Okay. Did someone just say
12 something?

13 All right, anything else on neutrons? I think
14 we're -- I think we should move on.

15 **DR. ULSH:** Mark, would this be a good time for
16 a brief bio break or comfort break?

17 **MR. GRIFFON:** Yeah. Yeah, that's a good idea.

18 I'll find some Motrin in the meantime, too.

19 Okay, we'll -- let's everyone on the call maybe
20 take till 2:00 o'clock?

21 **DR. WADE:** Okay, we won't break the line.

22 We'll just keep the line open and we'll be back
23 at 2:00.

24 **MR. GRIFFON:** Okay, all right.

25 **DR. WADE:** Thank you.

1 (Whereupon, a recess was taken from 1:50 p.m.
2 to 2:00 p.m.)

3 **DR. WADE:** Any other Board members on the call?

4 (No responses)

5 Okay, Mark, you can begin as you'd like.

6 **MR. GRIFFON:** All right. I think -- I think we
7 completed the hardest task, the neutron
8 discussions, and these other items I think are
9 -- are mainly clarifications from the last
10 call, just to see where -- you know, make sure
11 they're closed or not or where -- where we
12 stand with them, I guess, so we'll just go
13 through those one by one. I don't think it
14 should take too long.

15 Before we get started, I -- I think, Erin, did
16 you want to make a comment, 'cause I think it
17 might take longer than 20 minutes.

18 **MS. MINKS:** Yeah, I would just -- generally --
19 I'm Erin Minks from Senator Salazar's office.
20 I understand I have other colleagues from the
21 delegation on the line right now. We look
22 forward to seeing the Board in Denver later
23 this week and we should have some formal
24 comments to offer then about the petition, so
25 just thanks for letting me listen in and we'll

1 see you in a couple of days.

2 **MR. GRIFFON:** Right.

3 **DR. WADE:** Thank you for your time and
4 attention.

5 **B PLANT**

6 **MR. GRIFFON:** Okay, so the question on the --
7 the B Plant, I -- I think the -- the -- where
8 we stood with the -- this is a question again
9 of -- it's uranium workers and it's a back-
10 extrapolation of penetrating and shallow doses
11 from I believe 1960 -- '60 -- I don't think --
12 or at least there was a question about gaps in
13 the data prior to '60 -- am I getting this
14 right, Brant?

15 **DR. ULSH:** Mark, yes, the issue is that the
16 workers in Building 881 were not monitored for
17 external exposures prior to the fourth quarter
18 of 1960.

19 **MR. GRIFFON:** Right. So --

20 **DR. ULSH:** I'll have more to say about back-
21 extrapolation, but maybe I'll let you finish
22 your summary first.

23 **MR. GRIFFON:** Oh, well -- well, that -- that --
24 that was just about it. I think we --

25 **DR. ULSH:** Oh --

1 **MR. GRIFFON:** -- we wanted to make sure that --
2 I guess the question on the table was, you
3 know, was there a -- a -- suffic-- sufficient
4 data to bound the doses for these workers in
5 the earlier time period.

6 **DR. ULSH:** Okay. All right, I'll speak to that
7 then, Mark, if you're done.

8 **MR. GRIFFON:** Yeah.

9 **DR. ULSH:** This is -- this is going to be hard.
10 You've got to pretty much erase the memory
11 banks from the discussion that we had before
12 the break about neutron-to-photon ratios and
13 back-extrapolation of those. This is a
14 different situation.
15 It is true that we do not have monitoring for -
16 - external monitoring for these people up until
17 the fourth quarter of 1960. And the -- the
18 thinking at the time, as with other areas of
19 the plant, was that people who were not
20 expected to exceed ten percent of the exposure
21 limit were not required to be monitored and so
22 these people were not monitored for that
23 reason. What we have looked at, once we do
24 have monitoring -- and that is the fourth
25 quarter of 1960 and then the full year of 1961

1 -- we have compared what we observe to the
2 coworker doses that we would assign to
3 unmonitored people in those years. And what we
4 have found is that our coworker model --
5 coworker data exceed even the maximally exposed
6 of the monitored workers in '61 and in the
7 fourth quarter of '60 by large margins. Not
8 unreasonable margins, I don't believe, but
9 certainly large margins. And so what -- we're
10 not proposing to back-extrapolate any data in
11 1960 back into the '50s. What we are saying is
12 that these people were judged to be at less
13 than 10 percent of the monitoring limit, and
14 indeed that was the case once they were
15 monitored in '60 and '61. And what we are
16 saying is that the coworker doses that we
17 assign in those years do indeed bound their
18 exposures, and we looked at the history of
19 operations in that building, Building 81, into
20 the earlier '50s and we also believe that our
21 coworker doses that we assign in those years
22 would be bounding.

23 And we have a couple of reasons for thinking
24 that. If you look at the coworker doses that -
25 - well, maybe I should start with a little two-

1 sentence or so history of this building.
2 It came on line -- Building 81 came on line in
3 1953. That was the beginning of the uranium
4 operations there. In 1955, along with the
5 expansion around the plant, there was the
6 addition of a machining facility, and I think
7 SC&A has expressed some concern about that
8 perhaps. And then up to the fourth quarter of
9 1960 there was no monitoring, that's when the
10 monitoring started. And then finally in 1964
11 the enriched uranium operations were phased out
12 and transferred to Y-12.

13 Now, even if -- well, I don't see how the
14 addition of a machining operation in 1955
15 would, number one, cause the maximum dose
16 experienced by these workers to exceed even our
17 coworker doses. If you look at certainly the
18 operations later at Rocky Flats, and if you
19 look at the operations -- uranium machining
20 operations at other facilities, they don't even
21 approach the doses that we are assigning for
22 coworker, and those range between anywhere from
23 -- oh, I'm looking three, four, five, six,
24 seven rem of penetrating doses. And these
25 coworker doses that we have calculated are

1 based on the people who were monitored, and
2 those are -- you know, prior to 1960, those
3 include the plutonium operations and they
4 include the depleted uranium operations in
5 Building 44, which tend to have high shallow
6 doses. And the shallow doses that we are
7 assigning between '52 and 1960 range anywhere
8 from oh, three and a half or so rem up to oh, a
9 maximum I guess of about over eight rem, and
10 these are also very high compared to what you
11 would expect from a -- type of operations in
12 Building 81. So we --

13 **MR. GRIFFON:** Brant -- Brant, just for our
14 cross-reference, those values are in TIB-58.
15 Is that correct?

16 **DR. ULSH:** That's exactly right, Mark, Table
17 7.1; that's what I'm looking at right now.

18 **MR. GRIFFON:** (Unintelligible) follow along,
19 okay. Thank you.

20 **DR. ULSH:** So I think that's really all I've
21 got to say right now. That's the reasons for
22 our confidence in the coworker -- in the
23 coworker doses, what would be assigned to these
24 people since they were not monitored, at the
25 95th percentile.

1 **MR. GRIFFON:** Okay, and I -- I -- Arjun, I
2 don't know -- or -- or Joe, if you had anything
3 to add to -- you know, again, this is a -- I
4 think we've seen written materials on this,
5 too. I just wanted to summarize where we --
6 where we stood.

7 **DR. MAKHIJANI:** Yeah, Mark -- Mark, and from my
8 point of view, you know, we've discussed this
9 on the SC&A team and also with you that the
10 reason this is there, at -- at some length is
11 just to specify what -- what demonstration
12 aspects were kind of not really fully on the
13 table and -- and for you to decide -- you know,
14 we're -- we're not making any claims, one way
15 or another, about its SEC relevance. It's just
16 that the -- there's criteria and we're just
17 following those along for you to -- and be
18 explicit in what we say to you for you to
19 consider. That's it.

20 **MR. GRIFFON:** Brant, the only question I have -
21 - one question you answered already; one was
22 the -- when was the EU operation phased out,
23 and that was in 1964. You did a comparison
24 with the -- and I did mischaracterize that
25 back-extrapolation. I didn't mean that, but --

1 but the one way you compared to the '60 -- the
2 1960 fourth quarter data and the '61 data, did
3 you -- I mean I'm surpr-- the EU was phased out
4 in '64. Did -- did you look at '62 and 3 and
5 would it have given you the same -- I mean are
6 you confident it would give you the same sort
7 of results?

8 **DR. ULSH:** Well, we didn't, Mark, for a couple
9 of reasons. One, the 19-- fourth quarter of
10 '60 and then the year 1961 were the closest in
11 time to those earlier operations. And also we
12 didn't think that it would necessarily be
13 informative too much because the later years --
14 I mean '64 is when I believe the last of the
15 operations went to Y-12, but there was
16 certainly some ramp-down that you would expect.

17 **MR. GRIFFON:** Okay.

18 **DR. ULSH:** You know --

19 **MR. GRIFFON:** That's fine, that's fine, yeah.

20 **DR. ULSH:** -- prior to --

21 **MR. GRIFFON:** And did -- did -- and -- and the
22 last thing, the other operations pri-- the
23 machining came on line in -- in '55 --

24 **DR. ULSH:** Well, Mark, I'm -- I did -- that is
25 what I said. I think, though, that --

1 **MR. GRIFFON:** Or somewhere thereabouts.

2 **DR. ULSH:** Right around there.

3 **MR. GRIFFON:** Yeah, yeah. But -- but -- other
4 activities in that building, what -- what else
5 -- I mean they did -- they did do the chemical
6 processing as well or what --

7 **DR. ULSH:** Yeah, I'm looking at -- at Putzier's
8 Memoirs, Mark, and here's how he describes it.
9 Building 881 -- they did rather extensive
10 chemistry, foundry and fabrication operations
11 and that additionally it handled its own
12 recycle of enriched uranium scrap, and then
13 there was a supporting laboratory and
14 radiography facility.

15 **MR. GRIFFON:** Okay.

16 **DR. MAKHIJANI:** But there was a foundry in 881?

17 **DR. ULSH:** Yes, there was. That's -- that's
18 according to Putzier's Memoirs.

19 **MR. GRIFFON:** I thought the foundry was in 44.
20 It must have been a different foundry, huh?

21 **DR. ULSH:** Well, I think I know why you might
22 have felt -- might think that, Mark. There was
23 a concern in our earlier conversations back a
24 few working group meetings ago about in
25 Putzier's Memoirs it mentioned about high

1 contact dose rates in the foundry, and I think
2 there was some confusion about where that was.
3 That was in Building 44, the depleted uranium
4 foundry, where you do see high shallow dose
5 rates relative to what you would expect to see
6 in enriched uranium operations.

7 **DR. MAKHIJANI:** Yeah -- yeah, and you would not
8 see that in highly enriched uranium, but you
9 would see that in low -- you'd see the same
10 thing in low enriched uranium.

11 **MR. GRIFFON:** But probably no higher than the
12 DU.

13 **DR. ULSH:** No, it would not -- the shallow
14 doses would not be higher -- I mean they would
15 be the highest in the DU.

16 **DR. MAKHIJANI:** Yes, that's correct, but you'd
17 see a similar phenomenon in low enriched
18 uranium. In HEU you would-- you wouldn't
19 because you -- well, depending on the
20 enrichment, but you'd see it much less because
21 you've got so little U-238 there.

22 **DR. ULSH:** That is correct. That's why we're
23 confident that the coworker's shallow doses in
24 the '50s are probably dominated by the DU
25 workers, and we don't expect that people

1 working with enriched uranium would exceed
2 those.

3 **MR. GRIFFON:** Okay. All right, and I -- I
4 think we have enough -- I mean the oth-- the
5 other thing I think we might have as a point of
6 reference, and I'm not sure how direct a
7 reference we can make, but -- because I don't
8 know how the -- the buildings would compare and
9 I'm a little reluctant to make these kinds of
10 comparisons, but you know, all this operation
11 was shift-- switched to Y-12 and those -- the
12 magnitude of those coworker doses you gave, I
13 think you said three to seven rem penetrating
14 per year, that was sort of the range in the
15 early time period, I think -- is that right,
16 Brant? I was trying to find TIB-58 while we
17 were talking but I couldn't find it.

18 **DR. ULSH:** Yes, Mark, it does range anywhere --
19 between the years 1952 and, I don't know, let's
20 say 1960 -- well, '61 maybe --

21 **MR. GRIFFON:** Yeah.

22 **DR. ULSH:** -- it ranges from 3.2 rem at the
23 95th percentile up to -- I'm looking at maybe
24 7.8 rem.

25 **MR. GRIFFON:** All of those are the 95th

1 percentiles. Right?

2 **DR. ULSH:** That's correct, and that's what we
3 would apply to these unmonitored uranium
4 workers.

5 **MR. GRIFFON:** Oh, that's right, the -- okay, so
6 you would apply the 95th and those are that
7 high -- those -- those -- those, you know, seem
8 high based on other com-- comparable operations
9 is what you're saying also. Right?

10 **DR. ULSH:** Yeah, I am, with the appropriate
11 caution that --

12 **MR. GRIFFON:** Yeah.

13 **DR. ULSH:** -- as you stated.

14 **MR. GRIFFON:** Yeah. Okay. I -- I don't know
15 that we -- Wanda, do you have any questions, or
16 Bob or Mike?

17 **MS. MUNN:** I don't think so, I'm --

18 **MR. GRIFFON:** I think we probably have enough
19 information.

20 **MR. PRESLEY:** Yeah, this is Bob Presley. I'm
21 all right.

22 **MS. MUNN:** And I've not -- it's been a while
23 since I had any concerns that were not
24 addressed there. I think this --

25 **MR. GRIFFON:** Yeah.

1 **MS. MUNN:** -- covers that material pretty well.

2 **MR. GRIFFON:** Okay. Okay. All right. Then if
3 there's no more questions there, I think we can
4 -- you know, I think we have enough to make a
5 decision on there and I think that those doses
6 you mentioned from TIB-58 do seem, you know, on
7 the high side of what you would normally see in
8 these kind of operations, so I think we're -- I
9 think that it looks like it's sufficient to
10 bound for these workers, but I -- you know,
11 that's my opinion. I'll let other workgroup
12 members weigh in, but I think we can bring this
13 back to the workgroup and caucus on this
14 amongst ourselves.

15 **MS. MUNN:** Well, a lot of work's been done with
16 this --

17 **MR. GRIFFON:** Yeah.

18 **MS. MUNN:** -- and it -- it looks like it's in
19 quite adequate condition to me.

20 **TIB-38**

21 **MR. GRIFFON:** Okay. Then if everyone's ready,
22 we can move on to TIB-38, and I think TIB-38 is
23 sort of in -- in Brant's hands or -- maybe you
24 can give us a report on that, Brant?

25 **DR. ULSH:** Sure, Mark. We had some discussions

1 at the last working group meeting on April --
2 gosh, I think it was 19th maybe -- and we've
3 had a lot of discussions prior to this. And
4 the concern has been expressed -- primarily by
5 Mark, I think -- that there are differences
6 between the two databases that we have, CEDR
7 and HIS-20, and those differences primarily are
8 differences in the number of datapoints that
9 are included over the years. And it -- it does
10 appear, though, however, that the higher end
11 measurements are in both databases. And so the
12 concern is here that when we apply internal
13 coworker do-- coworker data, what we typically
14 do is we apply the 50th percentile intake
15 value. And as I understand it, and I will --
16 with the distribution, sorry -- 50th percentile
17 with the distribution. As I understand it, and
18 -- and I'm sure that I can count on Mark to
19 correct me if I misstate this, the concern of -
20 - considering the known limitations of HIS-20
21 and these observed differences, there was more
22 concern about the comparability, I believe, at
23 the 50th percentile than at the 95th
24 percentile. And so I think that those concerns
25 could be addressed by applying the 95th

1 percentile intakes.

2 Now I want to be very clear here that we don't
3 view this as setting a precedent that could be
4 applied to any other site. We are considering
5 this issue in other venues, but this issue
6 relates to the Rocky Flats databases
7 themselves. And so I think that, you know, in
8 an effort to reach resolution on this issue, I
9 think that we're prepared to agree to assign
10 the 95th percentile intakes in situations where
11 we are using internal coworker data at Rocky
12 Flats.

13 Mark, have I missed anything?

14 **MR. GRIFFON:** No, I -- I think that's -- yeah,
15 that's -- that's -- I think that's a reasonable
16 approach, given -- you know, like -- as you
17 said, Brant, there's -- you know, NIOSH has --
18 in your -- in your own evaluation report you
19 pointed out some of the shortcomings of the
20 database, and I think through the workgroup
21 process we've also pointed to some of those.
22 Nonetheless, you know, when we -- when we
23 looked at -- at -- and everyone on the call
24 probably knows how extensively we looked at
25 this, but we looked at logbooks and -- and as

1 much raw data as we could get our hands on,
2 including urinalysis logs. And I think we were
3 -- you know, what we saw -- and Joyce
4 Lipsztein, I don't think she's on the phone
5 call, but she also looked at this and, you
6 know, what she saw was basically that the
7 higher end data, you know, was there, the --
8 from the logbooks when we compared the high end
9 -- high end entries back to the database, it
10 was in the CER database, which is the one that
11 -- that's being used for the internal coworker
12 models.

13 Nonetheless, there was this question of, you
14 know, why don't the number of people match in
15 both databases, and it was -- you know, we
16 discussed that at length and -- and there is
17 some good reason why people were dropped. You
18 know, they do understand why a bunch of people
19 were dropped, but trying to sort out who got
20 put back in and who didn't I think got a little
21 overwhelming maybe, at least from my
22 standpoint, of how -- trying to understand why
23 these things didn't match up. So I think
24 that's a good solution. We're pretty confident
25 that these tails of -- of this database look

1 good, and if NIOSH commits to using, you know,
2 the -- the 95th, which is the upper end of the
3 datasets, then I think -- I think we could work
4 -- you know, I think that seems reasonable for
5 bounding, especially -- I think also we also
6 have to remember that -- and Brant's pointed
7 this out several times -- to me, as a matter of
8 fact -- that we -- we have to remember that
9 most -- most of the people have their own
10 individual bioassay data, so we're only looking
11 at a small number of people here. So I think
12 that, given those factors, I think it -- it's a
13 bounding approach.

14 The only thing I would -- the only caveat I
15 would say is that we might want to just follow
16 through, you know, with how this -- it takes it
17 off the SEC table, in my view, but I would
18 still want to see the mechanics of how --
19 'cause depending on how I worked with this, you
20 know, interpreting the 95th and how it's
21 applied, I think we still might want to just
22 take to ground, so to speak, but it's certainly
23 not an SEC issue, if that's -- if -- I believe
24 -- in my opinion, anyway, with this -- with
25 this approach that NIOSH is laying on the table

1 now. I don't know if others have an opinion on
2 that.

3 **MS. MUNN:** I guess I'd go even further than
4 that. I don't see any reason for us to be
5 required to go through the exercise of actually
6 doing the math for this. The -- the data's
7 there, and we've -- we've agreed that the 95th
8 percentile would be bounding. That's
9 instructional for the dose reconstructor and it
10 fulfills our requirements.

11 **MR. PRESLEY:** Wanda, this is Bob. I agree with
12 you.

13 **MR. GRIFFON:** Well, I -- I would -- I at least
14 agree it's off the SEC --

15 **MS. MUNN:** Yes.

16 **MR. GRIFFON:** -- table and I think the other
17 can be taken up as part of the DR process, so
18 it's not part of our function here. I think
19 you're right.

20 Anybody else -- any opinions on that?

21 (No responses)

22 Okay. We always get the quick ones after our
23 breaks.

24 **MS. MUNN:** Yes, that's true. As the Motrin
25 starts to wear off.

1 **MR. GRIFFON:** I just found some Motrin during
2 my break, too, so yeah, that's -- I waited too
3 long to take it, I think. The pain started
4 before I took them.

5 **MS. MUNN:** You're not supposed to do that.

6 **MR. GRIFFON:** I know, I know. Anyway, and now
7 I'm missing my agenda. Can someone help me?
8 What's next on our agenda?

9 **DR. ULSH:** Next on the agenda, Mark, is review
10 of example cases.

11 **WOUND MODEL**

12 **MR. GRIFFON:** Okay, the example ca-- before we
13 get to the example cases, actually I forgot one
14 thing, which is Jim Neton's favorite agenda
15 item that we keep -- that I keep bringing up,
16 the wound model. And I know, Brant, you sent a
17 response and I think you indicated that Jim was
18 probably going to give us a summary of that. I
19 just wanted to be able to close that out if --
20 you know, or -- or -- I think it's kind of
21 still an open item.

22 **DR. NETON:** Okay, yeah, Mark, if you'd like I
23 can --

24 **MR. GRIFFON:** Yeah.

25 **DR. NETON:** -- I can give you a brief run -- I

1 don't know -- if -- if -- I -- we sent out a --
2 I think it was last week, a very brief
3 description of our analysis of this. This was
4 something you brought up (unintelligible)
5 working groups ago. The idea was I think that
6 you ran preliminary calculations and
7 demonstrated that you could theoretically get a
8 higher dose applying a default wound model over
9 the chronic exposure model that we've adopted
10 for most situations when we have a lack of
11 monitoring data -- (unintelligible) a lack of
12 intake assumptions. We assume the intake
13 occurred chronically as opposed to acutely.

14 **MR. GRIFFON:** Just -- just to clarify, I did --
15 I did -- I only used an injection model on this
16 'cause I didn't have your wound TIB with me.

17 **DR. NETON:** What -- what -- see, I didn't even
18 remember what you used then, but --

19 **MR. GRIFFON:** Yeah.

20 **DR. NETON:** -- you'll see what we did is the --
21 the wound model is pretty simplistic. It's a
22 two-component (unintelligible) --

23 **MR. GRIFFON:** Yeah.

24 **DR. NETON:** -- with a 90 percent clearance with
25 a one-day half-life --

1 **MR. GRIFFON:** Right.

2 **DR. NETON:** -- and then the remainder clears
3 with a 150-day half-life, I believe. Well,
4 that -- that -- that puts the stuff pretty
5 quickly into the systemic pool, and it -- it's
6 -- actually we looked at it fairly closely. It
7 -- it could be modeled somewhere between a type
8 M and an F clearance from the lung if you want
9 to compare it to an acute intake into the lung.
10 But you know, because it's such a rapid
11 clearance of such a large percentage, it is --
12 it is the case that if you -- if you had a
13 wound, and I think the example we -- we sent
14 out showed a -- a wound on the -- the worst-
15 case scenario, which would be the -- the next
16 day after you left your sample or the first day
17 of employment, and then if you took a -- a
18 urine sample, say on an annual basis of 365
19 days, you can come up with a fairly large
20 missed intake --

21 **MR. GRIFFON:** Right.

22 **DR. NETON:** -- or uptake, I guess, for the
23 wound scenario. But when we compared that to
24 the chronic exposure model, and in particular I
25 think we were talking about cases in the -- in

1 the -- in the early '50s, the wound counter I
2 think came into being around 1958, somewhere
3 thereabouts, what we did is we compared a
4 chronic ten-year intake of plutonium with a one
5 dpm excretion on an annual basis to a -- using
6 a chronic model versus the acute wound model
7 and it turns out that up -- up until about two
8 years post-exposure, the wound model puts out a
9 -- a higher dose, an annual dose, and -- and
10 the case we modeled was one of the metabolic
11 organs, the bone surfaces. But after that, and
12 we used type F for the chronic inhalation
13 model, the annual intake ramps up considerably
14 to the -- to the extent that at five -- ten
15 years post-intake, you get five times the
16 assigned dose to the organ than you would with
17 the -- the wound model. So it's a little bit
18 of a mixed bag, but the other side of the story
19 is that there is very little probability of
20 causation, almost zero, assigned to acute
21 intakes very near -- to cancers that occur very
22 near the intake period, so it wouldn't really
23 affect, on balance, the cases, we don't think.
24 That's kind of --

25 **MR. GRIFFON:** And you -- and you --

1 **DR. NETON:** -- it in a nutshell. There's a lot
2 of different ways one could compare this and --

3 **MR. GRIFFON:** Yeah.

4 **DR. NETON:** -- we wrestled back and forth as to
5 how to show this and I can -- I can tell you
6 there's two or three other comparisons that
7 didn't make the -- didn't make it. But this
8 was the simplest, I think, approach that we
9 could -- we could take to try to demonstrate
10 (unintelligible) --

11 **MR. GRIFFON:** Now can you -- can you -- so you
12 did a chronic ten-year versus what for your
13 wound?

14 **DR. NETON:** The wound was just a single wound
15 on the first day of employment.

16 **MR. GRIFFON:** And -- and a -- and monitored ten
17 years later?

18 **DR. NETON:** No, no, it would -- it would have
19 been --

20 **MR. GRIFFON:** One year later.

21 **DR. NETON:** -- one year later it would have
22 shown up with one dpm per day in the urine.

23 **MR. GRIFFON:** Okay.

24 **DR. NETON:** So in other words, you know, you
25 would -- you would have not detected the wound

1 until a year later based on a one-year sampling
2 frequency and let's say it was just below one
3 dpm, that would be your missed intake for the
4 wound versus a chronic exposure scenario that
5 would give you one dpm per day out for ten
6 years.

7 We also did look at a chronic exposure for one
8 year and it's very similar to the graph that
9 was presented except that it doesn't ramp -- it
10 -- it crosses the -- right around the two-year
11 period as well, but it doesn't, you know, ramp
12 up quite as -- as large as the ten-year chronic
13 because obviously the exposure stopped at one
14 year. But it seems to be that two-year time
15 period is the crossover point.

16 **MR. GRIFFON:** Okay, and do you -- do you have -
17 - I -- I think that answers the question. I --
18 I do recall looking at this. I -- I don't
19 remem-- recall the cross-- and I saw the same
20 crossover, but I thought it was later in my
21 model, but do you re-- do you have IMBA runs
22 for these that you could just post or...

23 **DR. NETON:** No.

24 **MR. GRIFFON:** None -- nothing? Okay. Well, we
25 -- I can recreate just based on the parameters

1 you gave --

2 **DR. NETON:** Yeah, it's pretty -- it's pretty
3 simple, just --

4 **MR. GRIFFON:** Yeah.

5 **DR. NETON:** -- one dpm per day (unintelligible)
6 --

7 **MR. GRIFFON:** Yeah, yeah.

8 **DR. NETON:** -- and we didn't save the runs --

9 **MR. GRIFFON:** Didn't bother saving the runs,
10 yeah.

11 **DR. NETON:** Yeah.

12 **MR. GRIFFON:** Right.

13 **MS. MUNN:** It was pretty straightforward. I
14 can't imagine you'd have a whole bundle of
15 those, anyway.

16 **DR. NETON:** No, and -- and again, this is --
17 it's not surprising 'cause we've argued back
18 and forth several times about the -- the
19 appropriateness of a -- of a chronic versus
20 acute intake, and you can only have an acute
21 wound. You can't have a chronic -- well, you
22 can have multiple wounds, but when you get a
23 wound, it's an -- it's an acute intake.

24 **MS. MUNN:** It's acute.

25 **MR. GRIFFON:** Okay, well -- well, we -- we have

1 -- we have the response then on that.

2 **DR. NETON:** Yeah, and of course it's every --
3 you know, the -- the one day, the day of first
4 employment is the worst-case scenario. As that
5 wound moves closer and closer to the sampling
6 date, the problem becomes smaller and smaller -
7 - not the problem, but the divergence between
8 the two becomes smaller and smaller.

9 **MR. GRIFFON:** Okay. And -- and I -- yeah, I
10 have to -- I have to actually look back at my
11 own notes to think about how I characterized
12 it, but I was thinking, you know, of something
13 where the -- I'll have to look back at my IMBA
14 run and compare it with your paper, but I don't
15 think it's a major concern. We just want a
16 confirmation that we were bounding this sort of
17 situation since it was brought out in several
18 of the health physics reports from the early
19 years, so --

20 **DR. NETON:** Yeah, I believe that --

21 **MR. GRIFFON:** Yeah.

22 **DR. NETON:** -- there's one that you sent over
23 and there was basically a couple of sentences
24 in there that alluded to the fact that they --
25 they could have missed some wounds prior to

1 date of the wound counter.

2 **MR. GRIFFON:** Yeah. And I know tha-- the -- I
3 will also say that the scenario that I came up
4 with I thought was, you know, pretty ext--
5 relatively unlikely because if -- if someone
6 got a wound like this, I was showing, you know,
7 no monitoring or something for extended time
8 period and -- and no follow-up monitoring
9 later, and I think most of these people that
10 got these kind of wounds --

11 **DR. NETON:** Right.

12 **MR. GRIFFON:** -- were probably in the glovebo--
13 you know, in --

14 **MS. MUNN:** Yeah.

15 **MR. GRIFFON:** -- that line --

16 **DR. NETON:** Exactly.

17 **MR. GRIFFON:** -- where they would have had
18 frequent urinalyses so, you know...

19 **DR. NETON:** Yeah, that's what I would say, too,
20 so --

21 **MR. GRIFFON:** Yeah, so I -- I think I -- I sort
22 of looked at the worst case, so I think -- you
23 know, we've got this probably -- I think this
24 is enough for us to make a decision and ma--
25 this ma-- I think, again, this is just to make

1 sure that --

2 **DR. NETON:** Okay.

3 **MR. GRIFFON:** -- we're bounding all situations,
4 so...

5 **MS. MUNN:** Yeah, the model certainly covers the
6 likely scenario.

7 **MR. GRIFFON:** Okay, anything else -- and -- and
8 Joe, are you on the line? I don't -- I think
9 we asked Joyce to look at it, but I don't think
10 Joyce had a chance --

11 **MR. FITZGERALD:** Yeah, she -- she had some
12 access problems. I think those would be
13 cleared up, but I think this would be, you
14 know, looking at actual claimant data offering
15 some analysis of, you know, what -- you know,
16 what the coworker model provides and I -- I
17 think we'll have that shortly.

18 **MR. GRIFFON:** Okay. It -- it'll have to be
19 shortly.

20 **MR. FITZGERALD:** Well, I -- well,
21 (unintelligible) --

22 **MR. GRIFFON:** Yeah, I --

23 **MR. FITZGERALD:** -- talking to her today, but I
24 think --

25 **MR. GRIFFON:** Yeah, okay.

1 **MR. FITZGERALD:** -- she just had some technical
2 problems getting --

3 **DR. NETON:** And I -- I just heard something,
4 what are -- what are we going to -- what is --
5 what's going on with this analysis?

6 **MR. GRIFFON:** Well, Joyce hasn't looked at it
7 at all, so we had asked SC&A to look at this.

8 **DR. NETON:** Okay.

9 **MR. GRIFFON:** But at this late stage in the
10 game, I mean I -- I think we just -- you know --
11 -

12 **DR. NETON:** Yeah, I think that the default
13 position is -- I mean not the default but the
14 extreme position is that we have a wound model
15 that could be applied.

16 **MR. GRIFFON:** Right.

17 **DR. NETON:** It's a matter of which is the one
18 appropriate to apply. Our position is of
19 course that the chronic model is more
20 appropriate. But if --

21 **MR. GRIFFON:** Well, but again, Jim, this
22 scenario we were just discussing is that you
23 have someone that's wounded that you don't kn--
24 you didn't -- it wasn't recognized as --

25 **DR. NETON:** But that's my point. I mean if --

1 **MR. GRIFFON:** Yeah.

2 **DR. NETON:** -- if the anal-- if at the end of
3 the day the analysis is that you -- you know,
4 if the wound is more claimant-favorable, there
5 is a model there that --

6 **MR. GRIFFON:** Oh, okay, that you can assume all
7 these were from wound intakes or --

8 **DR. NETON:** Yeah, I'm not suggesting we do that
9 --

10 **MR. GRIFFON:** Right, right, right.

11 **DR. NETON:** -- but I mean if -- at the end of
12 the day, that --

13 **MR. GRIFFON:** Yeah.

14 **DR. NETON:** -- that is the backup position that
15 could be applied, but I don't think it has to
16 be.

17 **MR. GRIFFON:** Yeah.

18 **DR. NETON:** So --

19 **MR. GRIFFON:** I think that's what we need to --

20 **DR. NETON:** And I think at this late juncture
21 to start debating this issue then would...

22 **MS. MUNN:** No, we --

23 **MR. GRIFFON:** Well, yeah, that -- that's true,
24 Jim, but we did wait for this product for a
25 while, as well, so you know...

1 **DR. NETON:** No, no, what I'm saying, though, is

2 --

3 **MR. GRIFFON:** Yeah.

4 **DR. NETON:** -- what -- what -- even if the
5 analysis showed that the -- SC&A's position is
6 that the wound must be applied, there is a
7 wound model that could be applied.

8 **MR. GRIFFON:** You have a model and that can be
9 --

10 **DR. NETON:** Yeah.

11 **MR. GRIFFON:** -- be applied, yeah, yeah.

12 **DR. NETON:** So I think the analysis --

13 **MR. GRIFFON:** Okay.

14 **DR. NETON:** -- the information is all there to
15 be applied. It's just a matter of deciding
16 which is more appropriate.

17 **MR. GRIFFON:** Right. Okay, I -- I follow your
18 point. And I agree with that, yeah. Okay.

19 **MR. FITZGERALD:** But -- but the judgment is
20 that it may be off the table from the SEC
21 standpoint, but it sounds like there may be a
22 follow-up in terms of context of I guess what
23 we've been calling a site profile or whatever.

24 **MR. GRIFFON:** Yeah, and it may not even be
25 that, you know --

1 **MR. FITZGERALD:** Yeah, yeah.

2 **MR. GRIFFON:** -- depending on how Joyce comes
3 back. It may just --

4 **MR. FITZGERALD:** Yeah, I think we're awfully
5 close. I think it's just timing.

6 **MR. GRIFFON:** Yep, yep.

7 **MS. MUNN:** Well, the only reason we asked SC&A
8 to look at it was to make sure that the
9 approach was a reasonable one.

10 **MR. GRIFFON:** Right, that we could bound that -
11 - that -- yeah.

12 **MS. MUNN:** Yeah, and -- and I think that we've
13 seen it with the data we have.

14 **MR. GRIFFON:** Yeah, yeah, so I -- yeah. I'm
15 convin--

16 **MS. MUNN:** We've done it.

17 **MR. GRIFFON:** I'm convinced of that, too, I
18 just -- just -- yeah, I think we do have enough
19 information right now, so I think we -- we can
20 see that the approach is going to be bounding
21 and that they have this other model if there's
22 any problem with the approach, so -- you know,
23 they have the sort of backup, so either way we
24 have the data that we need, I think.

25 **EXAMPLE CASES**

1 Is there anything else on the table? I think
2 we're up to the example cases, as Brant just
3 said. And I'll -- I'll let -- well, Joe, I
4 don't know if -- has -- has your team evaluated
5 these example cases? I think we've discussed a
6 lot of the components of them anyway, so...

7 **MR. FITZGERALD:** We've discussed all the
8 components, and of course we -- we went through
9 quite a few in terms of the model validation,
10 the hypotheticals and what-not. I think Joyce,
11 again, needs to look at one or two actual
12 claimant cases, which we can't of course
13 include in the report, but we certainly would
14 like to have some kind of perspective offered
15 back this week. And again, unfortunately we
16 had the technical issues with her access and I
17 think we cleared that up today, but again, time
18 is --

19 **MR. GRIFFON:** Yeah.

20 **MR. FITZGERALD:** -- time has been mitigating
21 against us in a way on that one, so I'm hoping
22 that we will have something for the workgroup
23 by the Board meeting.

24 **MR. GRIFFON:** I -- I mean I -- I've looked at
25 the -- I -- I don't know if anybody else on the

1 workgroup has looked at the example cases, but
2 I've looked at the external and internal cases
3 and I think, you know, other than issues we've
4 already discussed today, I don't think there's
5 much else to -- to bring up on those cases.
6 The TIB-38 ones certainly, you know, would
7 change with our discussion.

8 **MS. MUNN:** We'd just be going over the same
9 material --

10 **MR. FITZGERALD:** (Unintelligible) validation --

11 **MR. GRIFFON:** Yeah, yeah, yeah, we've already
12 covered these, yeah.

13 **MR. FITZGERALD:** -- (unintelligible) quality
14 control validation. I know Ron's been doing
15 certainly some looking -- continued looking on
16 the neutron as well (unintelligible) --

17 **MR. GRIFFON:** Yeah, I don't know -- did Ron
18 look at the example cases?

19 **MR. BUCHANAN:** Yeah, you want me to give you a
20 summary of where I'm at on this -- of course
21 this is -- we've been doing most of our work on
22 the neutron issue --

23 **MR. GRIFFON:** Right.

24 **MR. BUCHANAN:** -- so I just took a look at
25 this over the weekend and little bit this

1 morning. Just to give a summary of where we're
2 at on that is NIOSH provided us with about 100
3 cases that had used OTIB-58, with claim numbers
4 so that I could go back to the -- the files on
5 the O drive and look at those, so I tried to go
6 back and look at about ten of them and I tried
7 to get some that was in the '50s and '60s to
8 compare some of that data. And what I found
9 was that -- I hunted for a min/max and -- and
10 say a best estimate because though -- because --
11 -- you can't just evaluate OTIB-58 by itself.
12 You've got to -- 'cause it includes OTIB-50 and
13 --

14 **MR. GRIFFON:** Right.

15 **MR. BUCHANAN:** -- and 27 and the TBD, and so I
16 -- I picked a couple cases that looked likely.
17 I didn't find a best estimate yet. I found a
18 min and three max I took a look at to see if
19 they applied it the way we understood they was
20 going to apply it, mainly. I first of all
21 looked to see if I could incorporate all these
22 factors, the 2.5 and the 1.99, and I found out
23 that that was going to take a complete dose
24 reconstruction report like I do for Task IV,
25 which is really what's needed to -- to see that

1 everything agrees with what we -- we
2 understand.

3 However, I did go through -- because of the
4 limited time, I did go through these four cases
5 that I selected that had some '60s data and one
6 that had '50s data, and at this point I guess,
7 without crunching all the numbers and see where
8 they hit the IREP numbers and everything, which
9 takes a lot of time, I did go look and look at
10 the philosophy of how they applied OTIB-58 to
11 these different cases. And I did find that
12 they did apply it to the periods that were --
13 that the worker was unmonitored and -- and
14 should have been monitored, and sometimes they
15 used the 95th percentile, sometimes they used
16 the 50th percentile, depending on his job
17 assignment during those gaps. And so that's
18 mainly at the point we're at right now is that
19 I guess you can state I didn't find anything
20 that would say send up any red flags. But I
21 haven't got deep enough into it to say this
22 proves that everything looks okay.

23 **MR. GRIFFON:** All right. But I -- I think that
24 -- that's important, too, just that you've
25 found that, you know, they were using those

1 models and they used the 95th or 50th,
2 depending on the type of jobs and stuff during
3 the gaps and, you know, that -- that deeper
4 view may be -- probably -- may be more -- say
5 more appropriate for the DR review, you know, I
6 --

7 **MR. BUCHANAN:** Yeah, that's really what --

8 **MR. GRIFFON:** Yeah.

9 **MR. BUCHANAN:** -- has to be done.

10 **MR. GRIFFON:** Yeah. I -- I mean I -- I think
11 we -- and we're discussing these factors, such
12 as the 1.99 and the 2.5, with our neutron
13 stuff, so I -- I don't know that we nee-- you
14 know, we may have enough for our SEC
15 deliberations is what I'm saying, without
16 getting into that depth. You know, given our
17 time frame, that's what I'm most concerned
18 about here is I don't want any last-minute
19 surprises on this.

20 The super S, I -- I also -- I don't think we've
21 -- since Joyce has been sidelined with the
22 computer, I -- I assume she hasn't reviewed
23 that case, but also I know that she's reviewed
24 super S up and down and sideways, so I think,
25 you know, we're not going to find anything --

1 you know, I think we're ok-- I think we're
2 going to, you know, find that we're going to be
3 okay with super S, but we should --

4 **MS. MUNN:** This is really (unintelligible) on
5 our (unintelligible) --

6 **MR. GRIFFON:** Yeah, yeah.

7 **MS. MUNN:** -- time line issue at all --

8 **MR. GRIFFON:** Right.

9 **MS. MUNN:** -- because we've -- we've dedicated
10 more than an adequate amount of attention
11 (unintelligible) --

12 **MR. GRIFFON:** Right, and like I've --

13 **MS. MUNN:** -- (unintelligible) --

14 **MR. GRIFFON:** -- from my standpoint, I've
15 looked at TIB-- the -- the internal model and
16 looked at the way it was applied, and it was
17 applied as I -- as I thought it was supposed to
18 be applied prior to our discussion today and --
19 but that -- that will -- will be modified, so I
20 think that -- that's okay, as well.

21 So I don't know that there's much more to add
22 on the -- the sample cases (unintelligible) an
23 issue.

24 **MR. SMITH:** This is Matt Smith (unintelligible)
25 and I've got one more thing to add, and that

1 regards the case that's discussed in -- on page
2 211 of the main report that was issued on April
3 5th. The example given there is a case where
4 the coworker model was applied for two
5 different years. In the text of the SC&A
6 report in a case that a full year of coworker
7 dose was applied and then a comparison is made
8 that is basically trying to show that somehow a
9 coworker dose isn't -- is not bounding. The
10 author of the report is Al Robinson, and Al of
11 course only passed away late last year, but I
12 did review the claims and when you read the DR
13 report Al made it fairly clear that only one
14 quarter of coworker dose model was applied, and
15 when you go into the external dose tool that
16 was used to calculate things and also
17 (unintelligible) review the dosimetry records,
18 what it -- how it reads for that particular
19 year, which they called out in the report,
20 which was 1969, the doses ran as follows: The
21 first quarter was 62 millirem, the second
22 quarter was 157 millirem, and the third quarter
23 was 15 millirem, the fourth quarter had no data
24 and that's where Al then took a portion of the
25 OTIB-58 coworker model and he chose the 95th

1 percent because this person was obviously doing
2 work, and he applied 447 millirem for that
3 fourth quarter. So from my view it seemed
4 that, number one, he applied things properly
5 and that we've adequately bounded things with
6 this claim.

7 **MR. GRIFFON:** Yeah.

8 **MR. SMITH:** Okay. That's all I had on that.

9 **MR. GRIFFON:** Thanks, that's probably more
10 detail than we need to digest on -- on -- for
11 now, but that's a good clarification so we can
12 go back to that if we need to.

13 All right, any -- any other issues that we
14 haven't discussed? I think the last two things
15 I had was the -- two items really which are
16 process items. Any other issues that we need
17 to discuss? Arjun or Joe --

18 **DR. MAKHIJANI:** No.

19 **MR. GRIFFON:** -- or Brant?

20 **MR. FITZGERALD:** No.

21 **MR. GRIFFON:** Okay.

22 **DR. ULSH:** I have nothing more.

23 **MATRIX**

24 **MR. GRIFFON:** The only thing I wanted to say
25 was that prior to the meeting, which is closing

1 in on me quickly, I -- I was planning on
2 updating this matrix, and I will talk to Liz
3 and Emily about how to do that, but I don't
4 anti-- I mean I -- it -- it's impossible I mean
5 to think that I'm going to put any privacy
6 information in there, but I will run this by
7 Liz and Emily. And maybe if I update with
8 redline comments or something, they can --

9 **MS. HOWELL:** Hey, Mark, if --

10 **MR. GRIFFON:** -- I don't know, I --

11 **MS. HOWELL:** -- I'm sorry, I --

12 **MR. GRIFFON:** -- (unintelligible) -- yeah?

13 **MS. HOWELL:** I guess it'll just depend on when
14 you -- what -- are you anticipating tomorrow
15 or...

16 **MR. GRIFFON:** Tomorrow, yeah. It has to be
17 tomorrow. I'm leaving for Denver, you know, so
18 tomorrow I need to get it out, yeah.

19 **MS. HOWELL:** Okay. Yeah, just send it to us.
20 I mean we're going to be in travel, too, but we
21 can look at it when we get to the --

22 **MR. GRIFFON:** I mean my -- my -- you know, this
23 was our template for several of our workgr--
24 you know, for a good portion of our time, then
25 we kind of broke off into the more final, you

1 know, determined serious issues --

2 **MS. HOWELL:** Right.

3 **MR. GRIFFON:** -- or, you know, the outstanding
4 issues I guess is a better way to put it, you
5 know, but I think we need to have a final copy
6 for all the members -- you know, for everyone,
7 for the Board, for all members of the public,
8 so that we can show whether -- how -- how
9 certain ones of these items were closed out and
10 what the final, you know, con-- conclusion of
11 those items was. I think some of them still
12 had remaining action items so I'll sort of do
13 some final edits on that -- that last piece and
14 get it --

15 **MS. HOWELL:** Okay, we'll --

16 **MR. GRIFFON:** -- (unintelligible) --

17 **MS. HOWELL:** -- look forward to it.

18 **MR. GRIFFON:** Okay. And then the --

19 **MS. MUNN:** I do hope you can, in most cases,
20 indicate closed.

21 **MR. GRIFFON:** Oh, yeah, well, that -- I think
22 it's clear.

23 **MS. MUNN:** I know we've not really and truly
24 used that kind of nomenclature in the past
25 (unintelligible) --

1 **MR. GRIFFON:** Yeah, no, I think that --

2 **MS. MUNN:** -- would be very helpful I think,
3 certainly understanding that a great many
4 people who've not been privy to our discussions
5 --

6 **MR. GRIFFON:** Yeah.

7 **MS. MUNN:** -- are likely to see that matrix.
8 It would be very wise I think to --

9 **MR. GRIFFON:** No, no, no, I --

10 **MS. MUNN:** -- (unintelligible) closed
11 (unintelligible).

12 **MR. GRIFFON:** -- I think that's clear, yeah,
13 yeah, I agree.

14 **PRESENTATION TO THE BOARD**

15 And the last item was just to -- not really an
16 item but just to say -- sort of discuss the
17 presentation to the full Board, and I think I
18 already --

19 **DR. WADE:** I think maybe, Mark, I could -- this
20 is Lew -- I couple of things leading up to your
21 comments.

22 **MR. GRIFFON:** Go ahead.

23 **DR. WADE:** Just thinking about the meeting
24 overall, as you know, Wednesday morning will be
25 a subcommittee meeting. Wednesday afternoon

1 will be a Board meeting. It will end with a
2 public comment period starting at 5:00 and
3 going for as long as there are people with
4 public comment, so we would assume we would
5 begin to hear from the Rocky Flats community
6 and interested parties on Wednesday afternoon
7 starting at 5:00.

8 And on Thursday morning, after a brief
9 introduction by Dr. Ziemer, the Rocky Flats
10 item, SEC petition, is scheduled to start at
11 8:15. I would imagine Dr. Ziemer would make
12 some introductory comments, just reminding
13 those of previous Board discussions and the
14 fact that this issue was assigned to the
15 working group to look at. I would think that -
16 - and you guys can correct me if I'm wrong --
17 that a brief representation of the SEC petition
18 evaluation report by NIOSH, not a full-blown
19 presentation but just a reminder, and then the
20 floor opened to petitioners for comments,
21 possibly members of Congress or their staffs
22 just to fill the air with their thoughts and
23 views. And then it would go to Mark as the
24 chair of the working group to present, and this
25 would be the matrix, anything you would choose

1 to do, Mark.

2 The way -- the way workgroups have normally
3 done it is the chair would make a presentation
4 -- not ending in a motion but just simply
5 putting before the Board the thoughts of the
6 workgroup. Other members of the workgroup
7 would be invited to comment by the chair if
8 they wished. And then the Board would begin to
9 deliberate on the materials presented, moving
10 towards a motion of some type.

11 So Mark, now I go to you. We can do a
12 different order than that or -- as you would
13 like. On Thursday evening is another public
14 comment period. The Board is scheduled to
15 debate and work Rocky Flats through lunch on
16 Thursday. As you know, we've built in a time
17 always on the last day for the precise wording
18 reviews of any recommendations the Board makes
19 on SEC petitions, so that would be scheduled
20 for Friday at 11:15. So --

21 **MR. ELLIOTT:** Lew, this is Larry Elliott. I
22 just want to make sure I heard you correct at
23 the start of your -- your comments here. Did
24 you say that -- that NIOSH would be expected to
25 present a -- our evaluation report again?

1 **DR. WADE:** It's -- I would think a brief
2 synopsis is in order, Larry, but I -- I leave
3 that to you and the working group to discuss
4 now.

5 **MR. GRIFFON:** Yeah, I -- I mean I would -- I
6 would think since it was a while ago that we
7 had this, I would think it might be appropriate
8 just for that brief presentation again by
9 NIOSH.

10 **MS. MUNN:** It was very helpful for me to see it
11 again recently. I appreciate that having been
12 sent out.

13 **MR. GRIFFON:** Yeah.

14 **MR. ELLIOTT:** We sent it out -- I asked Brant
15 to send it out because the two new Board
16 members, or maybe three new Board members --

17 **MR. GRIFFON:** Right.

18 **MR. ELLIOTT:** -- hadn't seen it before, or
19 didn't -- may not have known of its existence.

20 **MR. GRIFFON:** Right, right.

21 **MS. MUNN:** That was very helpful. I guess the
22 only question is whether the full report needs
23 to be duplicated or whether just selected items
24 from that would be appropriate.

25 **DR. WADE:** I mean I leave that to you, Larry,

1 Brant and the workgroup to discuss right now
2 and --

3 **MR. GRIFFON:** Yeah, I -- I would -- the -- I
4 don't think we need as full a -- you don't need
5 to repeat everything you said, Brant, if you
6 present this again, but I think a synopsis, as
7 -- as Lew said, would be good 'cause it would
8 give us a -- you know, especially for those who
9 are -- have not seen it before. You know
10 (unintelligible) --

11 **DR. ULSH:** Mark, should I just limit it to -- I
12 mean, as you know, after I presented in April
13 of last year, we've covered a lot of ground in
14 the working group.

15 **MR. GRIFFON:** Yeah.

16 **DR. ULSH:** Should I just limit it to the issues
17 presented in the petition?

18 **MS. MUNN:** That would be -- that would be wise.
19 That would seem quite wise.

20 **MR. GRIFFON:** Yeah, yeah, I think that would be
21 -- yeah, that'd be fine, yeah.

22 **DR. ULSH:** All right, well, I can -- I can put
23 something together.

24 **MR. GRIFFON:** Yeah.

25 **DR. WADE:** And then the petitioners would be

1 given a chance, and then the workgroup would
2 then present -- now I would assume as the
3 workgroup presents that, Mark, you might be
4 asking SC&A or Brant for some comment or input,
5 but -- but that I leave to the working group --

6 **MR. GRIFFON:** Yeah, that I would --

7 **DR. WADE:** -- as you would --

8 **MR. GRIFFON:** -- that I was thinking that I
9 would present and my -- my notion was to come
10 up with some summary. I mean I'm not going to
11 go through the entire matrix, but I'm also
12 going to come up with some summary of where we
13 stand on -- on some of the issues that we --
14 that, as we wound down, became the critical
15 ones and -- and before -- what I was going to
16 ask is Wednesday evening the workgroup -- just
17 the workgroup members, we can get together and
18 -- and go through these -- these sort of final
19 points that, as a workgroup, we want to make.
20 And although they're not recommendations, I
21 think, you know -- you know, they're going to
22 be important for the whole Board to hear for
23 its deliberations, so... And then my -- my --
24 my notion was to, sort of as I -- as I discuss
25 some points, I might call in SC&A and/or NIOSH

1 to -- to clarify or -- or, you know, to present
2 their opinions on certain key points, you know,
3 to --

4 **MR. PRESLEY:** Mark --

5 **MR. GRIFFON:** -- to add more of the technical
6 details -- yeah?

7 **MR. PRESLEY:** -- when do you want to do this
8 now, Wednesday evening?

9 **MR. GRIFFON:** Yeah, I was thinking briefly for
10 us to get together, not -- not a transcribed,
11 full workgroup meeting, but just for the four
12 of us to sit down with paper and computer or
13 whatever and --

14 **DR. WADE:** I will round -- I will round you up.
15 As soon as the public comment period is over --

16 **MR. GRIFFON:** Yeah.

17 **DR. WADE:** -- I'll try and get the four of you
18 to decide if you want to do it then or if you
19 want to have a dinner break and then come back
20 and -- and I'll take the task on of trying to
21 herd you --

22 **MR. GRIFFON:** Yeah.

23 **DR. WADE:** -- to -- to some interaction.

24 **MR. GRIFFON:** Yeah.

25 **MS. MUNN:** Thank you, that would be helpful.

1 **MR. PRESLEY:** Thank you, Lew.

2 **MR. ELLIOTT:** I just want to be -- this is
3 Larry Elliott again. I want to be clear on
4 what you were just talking about. That's a
5 meeting of the working group themselves without
6 attendance by NIOSH/OCAS, or I guess there by
7 SC&A.

8 **MR. GRIFFON:** That's right.

9 **MR. ELLIOTT:** For you guys to hash out where
10 you want to be.

11 **MR. GRIFFON:** Yeah, yeah.

12 **MR. ELLIOTT:** Understood.

13 **MR. GRIFFON:** Yeah.

14 **MR. ELLIOTT:** So Brant and -- and/or the ORAU
15 team members will not participate in that
16 meeting.

17 **MR. GRIFFON:** No, that's right.

18 **MR. ELLIOTT:** Thank you.

19 **MS. HOWELL:** Lew, Liz and I will be happy to
20 help you with that, if need be.

21 **DR. WADE:** Thank you.

22 **MS. MUNN:** I have a suggestion or so. I would
23 hope that either Paul or you, Mark, in opening
24 remarks setting this up -- I think it would be
25 actually helpful if Paul would do it, but I'm

1 not certain how easy it is to accumulate the
2 information -- seems very wise in light of the
3 record to include in the opening comments the
4 number of meetings that the official working
5 group has had, rough approximation of the
6 technical interactions between the agency and -
7 - and the contractor. It would be -- it seems
8 to me very acceptable and almost necessary for
9 the audience and for individuals later reading
10 the transcript to understand very clearly how
11 much effort has gone into this.

12 **MR. GRIFFON:** Yeah, yeah --

13 **MS. MUNN:** I would not want anyone to ever get
14 the idea that these issues that were brought
15 before us were given short shrift, ever.

16 **MR. GRIFFON:** Right, right. No, I agree with
17 that and that -- that's certainly --

18 **DR. WADE:** Maybe you, Mark, and I can get with
19 Paul at some point and decide how best to do
20 that.

21 **MR. GRIFFON:** Yeah, yeah. Well, I was going to
22 include that, but if Paul wants to give it is
23 an -- or either way, yeah, yeah.

24 **DR. WADE:** Either way? Good. If you bring the
25 bullet, somebody can fire it.

1 **MR. GRIFFON:** Right. Okay. Is there any --
2 anything else then on that? And -- and I would
3 say to my workgroup colleagues that I would
4 circulate something, but it might not be till
5 we're out there, you know, as far as -- so
6 maybe I can, you know, give you something on
7 paper to sort of edit -- tear apart and then we
8 can meet Wednesday night. I'm not sure that
9 I'm going to get it done before I leave
10 tomorrow, but you know, I've certainly got a
11 starting point, but I'll -- I'll try to get
12 something to you as soon as I can and then
13 we'll work real time with it, you know --
14 **MS. MUNN:** As long as our respective --
15 **MR. GRIFFON:** -- together (unintelligible).
16 **MS. MUNN:** -- computers (unintelligible)
17 systems crash, we're --
18 **MR. GRIFFON:** Yeah, yeah.
19 **MS. MUNN:** -- (unintelligible).
20 **MR. GRIFFON:** Right, right.
21 **MR. PRESLEY:** Hey, Mark --
22 **MR. GRIFFON:** Yeah?
23 **MR. PRESLEY:** -- this is Bob. You know, if --
24 if there's time even Wednesday after your first
25 meeting, you'll be there, Wanda'll be there and

1 I will -- I'm coming in Tuesday night. I don't
2 know when Mike's going to be.

3 **MR. GIBSON:** I should be there Tuesday night.

4 **MR. PRESLEY:** Okay, so but -- you know, if
5 there's some time that morning --

6 **MR. GRIFFON:** Wednesday morning? Yeah --

7 **DR. WADE:** After the -- after the subcommittee
8 meeting.

9 **MR. PRESLEY:** Right after the subcommittee
10 meeting --

11 **MR. GRIFFON:** Okay.

12 **MR. PRESLEY:** -- we could kind of get our
13 thoughts together, too, that might help.

14 **MR. GRIFFON:** Yeah, that's an opportunity to --

15 **MS. MUNN:** But that one may run long.

16 **DR. WADE:** Well, I will try -- at the end of
17 subcommittee, I will ask you four what you wish
18 to do. I'll make it a point to do that.

19 **MR. GRIFFON:** Okay.

20 **MS. MUNN:** All right. Thanks.

21 **MR. PRESLEY:** Hey, Lew?

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

23 **MR. PRESLEY:** Do I need to sit in in the back
24 of that audience on that subcommittee since I'm
25 an alternate?

1 **DR. WADE:** You're more than welcome.

2 **MR. PRESLEY:** I will do that.

3 **MR. GRIFFON:** Okay. Well, I think -- I think
4 we're done for now. We'll all be reconvening
5 in a few days.

6 **DR. WADE:** Thank you all very much.

7 **MR. GRIFFON:** Right, thanks, everybody.

8 **MR. PRESLEY:** We'll see y'all in a couple of
9 days.

10 **MR. GRIFFON:** Bye.

11 **MS. MUNN:** Bye-bye.

12 (Whereupon, the meeting concluded at 2:55 p.m.)

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CERTIFICATE OF COURT REPORTER**STATE OF GEORGIA****COUNTY OF FULTON**

I, Steven Ray Green, Certified Merit Court Reporter, do hereby certify that I reported the above and foregoing on the day of April 30, 2007; and it is a true and accurate transcript of the testimony captioned herein.

I further certify that I am neither kin nor counsel to any of the parties herein, nor have any interest in the cause named herein.

WITNESS my hand and official seal this the 29th day of May, 2007.

STEVEN RAY GREEN, CCR
CERTIFIED MERIT COURT REPORTER
CERTIFICATE NUMBER: A-2102