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

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ADVISORY BOARD ON RADIATION AND WORKER HEALTH

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WORK GROUP ON TBD-6000

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THURSDAY
JUNE 20, 2013

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The Work Group met telephonically at 10:30 a.m. Eastern Daylight Time, Paul Ziemer, Chairman, presiding.

PRESENT:

PAUL L. ZIEMER, Chairman
JOSIE M. BEACH, Member
WANDA I. MUNN, Member
JOHN W. POSTON, Member

ALSO PRESENT:

TED KATZ, Designated Federal Official
DAVE ALLEN, NIOSH ORAU
BOB ANIGSTEIN, SC&A
BOB BARTON, SC&A
SAM GLOVER, NIOSH ORAU
MONICA HARRISON-MAPLES, NIOSH ORAU
JENNY LIN, HHS
JOHN MAURO, SC&A
DAN McKEEL
JIM NETON, NIOSH ORAU
JOHN RAMSPOTT
BILL THURBER, SC&A
TOM TOMES, NIOSH ORAU

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P-R-O-C-E-E-D-I-N-G-S

(10:31 a.m.)

MR. KATZ: This is the Advisory Board on Radiation and Worker Health, the TBD-6000 Work Group.

We have an agenda that is posted on the Board's webpage under today's meeting date, for people who want to see that, and there are some other materials also posted at that location that would help people follow along with the discussion today.

Let's do roll call. We're speaking about several specific cites -- GSI, Baker Brothers, Joslyn, and Simonds Saw, although there is not going to be so much discussion about the latter three sites. But please speak to conflict of interest for agency related people, including the Board, when we do roll call.

(Roll call.)

MR. KATZ: Well, we can proceed

to the agenda. Just let me remind everyone on the call, when you are not addressing the group, please mute your phone so we have less trouble with the audio. And if you don't have a mute button, press *6 to mute your phone, and, again, *6 to take your phone off of mute.

Thank you very much.

CHAIRMAN ZIEMER: Okay. Thank you, Ted. I will officially call the meeting to order.

The agenda for the meeting is posted on the website, and it has also been widely distributed. So we will proceed through the agenda as it was distributed.

I am going to not specify exactly when we will take breaks at this point, but, again, we will take breaks as needed, and just proceed through the agenda as long as we are able to keep at it. There are a lot of things to cover under Item 3, GSI. Items 4, 5, and 6 should not take very long.

We will begin, though, with Item 2 on the agenda, the supplementary comments on TBD-6000, Rev 1, which comments were distributed in May by SC&A. And I think everybody got those. I think, Bill Thurber, are you going to lead us through the comments, and then NIOSH will have a chance to make some response, if needed.

MR. THURBER: I can do that.

CHAIRMAN ZIEMER: Well, go ahead, Bill.

MR. THURBER: Okay. I trust that everybody has the documents. There is a lot of material in there, a lot of detail. I don't propose to go into any of the detail unless there is need to.

The document addressed four issues. One was we took another look at the question of the appropriateness of the terminal settling velocity of 7.5 times 10 to the minus four meters per second, and

associated with that the time that would be required to reach an equilibrium surface concentration based on deposition from airborne contamination.

We looked at the attenuation rate of surface contamination; that is, the balance between deposition and removal processes. We looked at a number of sites -- I think four sites -- and we compared the site-specific air concentrations with the generic air concentrations used in TBD-6000.

You will recall -- or you may not recall, but the basis for the data in TBD-6000 was a fairly comprehensive report by Harrison-Kingsley, which was published in 1959. And they had data on a lot of generic operations, such as forging, extrusion, et cetera.

The paper never did identify which particular sites they collected data from, so we don't know where the specific information came from. So what we did was we compared the

generic information from TBD-6000 derived from Harrison-Kingsley with data from specific sites such as Simonds Saw and Steel, Joslyn, and so forth, to see whether -- how the generic data compared with some site-specific data to see whether the generic data was sufficiently conservative to ensure that the workers were properly protected based on using that data in dose reconstruction.

And the final thing that we looked at in this document was some operations that weren't specifically covered in TBD-6000. Some people had suggested, well, floor-sweeping could be a very dusty operation, and you might get higher air concentrations than you would -- than were represented by the data in TBD-6000.

There was also a question of whether uranium fires might cause extraordinary air concentrations. As everyone knows, uranium is very pyrophoric. It's easy

to burn, and there are frequent extensive examples in the literature of uranium fire. So we tried to address that point.

So those were the four general areas that we looked at. And if you go to skip all of this intermediate material, and if you go to the conclusions in Section 6, we can kind of summarize. And then if people have questions, we can get back into some of the detail.

As I say, we took another look at this question of the terminal settling velocity for five micron 8 MeV particles. NIOSH had done this before and concluded that that number was a claimant-favorable value.

We took another look at it from a different perspective using somewhat different data, and we agreed with NIOSH's conclusion that that is a good number, that 7.5 times 10 to the minus four meters per second is a good number for those kind of particles.

The second thing we looked at was the question of how long it would take for the surface concentration that resulted from fallout from contaminated air to reach an equilibrium value. This question had come up before. NIOSH had addressed it. NIOSH provided revisions to TBD-6000 to better document a value for the deposition, the time to reach equilibrium.

And NIOSH concluded that a number of about 30 days was a reasonable value to use in calculating the surface buildup from fallout of contamination from the air.

We looked at it on -- again, using a little different calculational approach, using different number sets, and we felt that while on average the NIOSH number of 30 days was reasonable, we came up with an average value of somewhere between 33 and 37 days.

We felt that based on the information we were dealing with, which was

primarily a report by Adley dealing with some studies that were done at the melt plant building at Hanford, that there were clearly cases where 30 days would not be adequate to cover all of the situations.

As I say, on average it looked like a pretty good number, but we provided some calculations that suggest that the number could be as high as around 84 days. So that is an issue I think that probably requires some further discussion.

As I mentioned, we compared data from the generic operations in TBD-6000, such as rolling and extrusion, and so forth, with values from four or five sites, and in general we found that while there were in some cases measured numbers for particular operations at a specific site that were higher than the geometric mean values used in TBD-6000, and also the arithmetic mean values, that these values were clearly subsumed within a full

log-normal distribution with a geometric standard deviation of five.

And we showed that whether you use these higher values as a constant, or whether you use the full distribution in calculating the Probability of Causation for a hypothetical worker, that the numbers were not significantly different.

We based our analysis in most cases on comparing the site-specific values with the arithmetic mean values rather than the geometric mean values derived from TBD-6000, because we felt that the arithmetic mean values were -- using the arithmetic mean values was a better basis of comparison with the daily weighted averages, which were typically the value that is presented in TBD-6000.

So there was more emphasis in our analysis on arithmetic mean values for that reason, but it doesn't affect the conclusion.

We looked at a couple of instances where there was some information on chip fires, and we found that even though people talk about clouds of vapor, and so forth, that the values that we uncovered were covered by the variables, the range of variables for equivalent operations in TBD-6000, so that if you used the TBD-6000 values you would cover the kinds of airborne concentrations from uranium fires.

And it was interesting, we didn't have the information at the time, but recently NIOSH had arranged a telephone interview with a worker from Joslyn Steel who was involved in actually taking the waste from a centerless grinding machine and burning it.

And he gave us a very clear description, and it was quite fascinating, really. They took this residue from the bottom of the machine, and it was wet because the grindings were immersed in the cutting

fluids. And they just shoveled it out, and they dumped it into a trough that was outside the building right next to where the centerless grinding machine was.

And they filled up the trough, the steel trough, and they put a cover on it, and they stuck a piece of brown paper in there and lit it with a match, and it went whoosh and it was done. So there was not a sustained fire or anything like that in this particular instance at Joslyn.

And the reaction was apparently almost instantaneous, and the other interesting -- another interesting facet of the whole deal was that they would call the Weather Service every night, because they did this burning, or one guy did basically, they did this burning at night and they'd call the Weather Service and ask what the wind velocity was.

And if the wind velocity was at

least I think seven miles per hour, then they would go ahead and ignite this residue. And if it wasn't, then they'd hold off until the wind velocity picked up.

So anyways, that kind of -- that story, that interview, at least anecdotally, supports I think the conclusion that the uranium fires are fundamentally embraced within the TBD-6000 data set.

We also estimated the equilibrium removal rate from particles and found that that was about .035 per day, and this is much higher than the removal rate that is in OTIB-70. And we felt that was not surprising since OTIB-70 uses -- if you measure a beginning point for the residual period, and then 10 or 20 or 30 years later you measure an endpoint, and that's how the number -- the removal rate in OTIB-70 was calculated.

But if you -- it is quite reasonable to suspect that equilibrium is

attained in a much shorter time and that would be supported by the removal -- the equilibrium removal rate that we estimated.

We found some data on floor sweeping and concluded that -- again, that the -- any dust generated by floor sweeping was adequately covered by the TBD-6000 data set. And, well, we have kind of already talked about the outdoor burning, which we found was -- did not seem to be -- did not seem to result in air concentrations that were beyond the -- again, beyond what is embraced in TBD-6000.

And a final minor comment, it appeared that there are some calculational errors in some of the tables in TBD-6000 that ought to be checked.

So that's it in a nutshell. As I say, I think that the main thing that we felt ought to be further considered is this time to reach equilibrium in terms of surface

deposition where the 30-day number that is currently used in TBD-6000 may not be sufficiently claimant-favorable.

CHAIRMAN ZIEMER: Okay. Thank you, Bill. So in all of your bullet points there, the only points where I see that there is any issue is that one you just mentioned, which is basically your second bullet point on your conclusions, and then that calculational issue that you raise at the end on the GMs in Section 7.

MR. THURBER: Right. Yes.

CHAIRMAN ZIEMER: But, let's see, any immediate response from NIOSH? Who is going to sort of look at this? Dave, are you or Jim --

DR. NETON: This is Jim Neton. Yes, Dave Allen and I both looked it, but I think Dave is prepared to at least talk about the one issue that was identified by SC&A.

CHAIRMAN ZIEMER: Go ahead, Dave.

MR. ALLEN: I just wanted to start by saying, yes, we agree with pretty much everything SC&A put in that report, including the calculational error, and that will be fixed with the next revision. The one issue we had is the one that Bill mentioned that needs further discussion, and that is the settling times for determining contamination levels.

I've got a little bit of an issue with how SC&A did this evaluation. Primarily, the only time that it is really used is to determine a surface contamination level from an airborne concentration, what the equilibrium level would be. And I think everybody probably knows that, you know, what we do is simply the airborne times the settling rate times the time it takes to reset equilibrium gives us that concentration, that surface concentration.

So airborne aside, the important

parameter here is not so much the settling rate or the settling time; it is the product of the two. That's the default parameters that would be used.

SC&A's review, they looked at the 7.5 times 10 to the minus four settling rate that we are using, and I think the report said that there appeared to be a favorable settling rate, but that's not the settling rate they used to determine the time for equilibrium, which is kind of trying to compare apples to oranges here. That's not what we would be doing and not how the 30 days would be used.

Just substituting the .00075 settling rate instead of the .00052 that SC&A used reduces those numbers by about 30 percent or so, the settling time numbers that SC&A came up with.

Thus, SC&A was suggesting we should use the .00052. I wasn't clear on that, but in the settling rate area -- section

of the report it seemed to be agreeing the 7.5 would be a sufficient conservative number.

Also, on that, the airborne value they used for Adley was 1,400 micrograms per cubic meter. I don't think that's significantly far off, but there is no distribution associated with it. And where it came from wasn't actually an estimate of airborne, it wasn't a measurement of airborne, it was just an "if" statement in the document.

And if we were to take data from Adley to try to estimate the dose in that metals building, we would not use that number. We would never be allowed to use that number. We would have taken the air sample data and determined a distribution, and used either the distribution or the 95th percentile of that distribution.

I think that would be the more appropriate comparison is using those numbers times the .00075 times the 30 days and see how

that compares to the contamination numbers that were actually used in Adley, or measured in Adley.

The last thing I want to say is in I think it was Issue 5 when we went through TBD-6000, the purpose at that point was to compare what we would determine using TBD-6000, which is potentially some default values for a variety of tasks, and what kind of surface contamination we would get from that.

And that's what we did in that White Paper for Issue 5 for TBD-6000, and that was based on it being a TBD-6000 review. And I think -- I could be wrong, but I think SC&A pointed out in their review that the TBD-6000 values typically are higher than the airborne values they would get in Adley.

And so if we were actually using TBD-6000, we would be starting with essentially a conservative -- a higher value, a conservative value, for the air sample, for

the airborne concentration, would be multiplying it by a higher settling rate than SC&A used in this evaluation. And I'm not so sure we would be getting a lower contamination number than what Adley measured.

So I just don't think the comparison used here to develop those days to equilibrium values is an appropriate analysis.

CHAIRMAN ZIEMER: Okay. Thanks, Dave. I'm wondering if it would be helpful if NIOSH were to actually commit what you just said to writing in a more formal way, and then that would give SC&A a chance to look at that in more detail, and so we could see if we can come to closure on that issue, unless SC&A already, you know -- well, let me ask it this way.

Bill, would you want to have a closer look at that and have a chance to respond next time around?

MR. THURBER: Yes. I would for

this reason, Paul. Obviously, it's kind of complicated, and, you know, I hear what David said. One of the things that I didn't talk about when I ran through this is that all of the settling velocities that were calculated from the Adley data, from the Hanford melt plant, were lower than the 7.5 times 10 to the minus four.

And, as David said, and we agreed with, that means that this theoretical terminal settling velocity is conservative in terms of calculating -- in doing some of the calculations. What we talked about in the report in a little more detail is why it might be that the actual numbers were lower than this theoretical value, and we provided some information about the need to consider slip of the particles between the air molecules, and things like that, which resulted in a lower terminal velocity.

So there was reason for that.

Now, whether it is appropriate or inappropriate to then use that to calculate the settling time is something that, you know, I'd like to hear NIOSH's thoughts on it in writing, because it's very difficult to put all of these pieces together without looking at them on -- at least for me it is, to look at them on paper.

CHAIRMAN ZIEMER: Okay.

MR. THURBER: And one other point is that I think as I recall, because David very kindly shared his spreadsheet with me for the original NIOSH calculations and how they arrived at the 30-day number, there is an apples and oranges question there, too, in that in calculating the number of days the amount settled on the surface was taken from Adley.

The settling rate was actually taken I believe from working with the numbers in TBD-6000. And David can correct me if I'm

wrong on that.

So the way that we approached it, we -- in making this time to reach equilibrium calculation, we only used the Adley data. So, again, we are trying not to get into an apples and oranges situation. We may not have done that, I don't know, but anyway it would be good to see something in writing.

CHAIRMAN ZIEMER: Okay. That certainly seems like a good direction to go. Dave, if you could spell out basically what you told us, just commit that to a very brief sort of White Paper, and then SC&A can have a chance to bite that data a bit and understand fully what the approach is there, and maybe we can resolve this. And that would basically take care of the issues that have arisen through this supplementary comments document.

And then, I don't know if there is -- well, you probably can't give us a time table now, but basically what you just told

us, it would just be a matter of committing it to writing and letting SC&A have a chance to study it a bit.

MR. ALLEN: Yes. I can definitely commit to that. As Bill said, it's somewhat of a complicated and convoluted topic, so I don't know how brief the White Paper will be, but we will --

CHAIRMAN ZIEMER: Well, I only say brief in the sense that you were able to go through it in several minutes. So, and there may be some additional issues that you would insert once you put it -- commit it to writing, but in any event to formalize it so not only SC&A fully understands the points, but the Work Group and others as well.

MR. ALLEN: Right.

CHAIRMAN ZIEMER: And I think we can come to resolution on this issue.

DR. MAURO: This is John. I might be able to help a little bit, because I

understand that David's position is, well, when you look at the big picture, if you are starting off with relatively high concentrations of airborne dust loadings, as obviously they are doing in TBD-6000, and then you multiply that by a relatively high deposition velocity, the .00075 per meter, and then you multiple that it's going off of 30 days, you are going to basically -- what is being said is that because the other two parameters, the airborne concentration and the deposition velocity, are probably somewhat overestimated.

It makes up for the fact that maybe our period over which it takes to reach equilibrium may be somewhat underestimated is offset. And I would agree with that, in other words, if you take it in the aggregate. But I think it's important that that be understood. That is, that --

CHAIRMAN ZIEMER: It needs to be

spelled out, and that --

DR. MAURO: Yes. And --

CHAIRMAN ZIEMER: That would be helpful.

DR. MAURO: Yes. But I think that -- and what I would be especially interested in, Dave, is that if you think that notwithstanding the offsetting effects of the three parameters, the number itself, the 30 days, how well does that stand up? You know, as a number on its own merit, as opposed to, oh, it's okay as long as it's done within the context of the other two conservative assumptions.

So, I mean, I just -- I want to point that out because it's important to make that distinction.

CHAIRMAN ZIEMER: Yes. And you can look at that issue as well as you review the thing.

DR. MAURO: Yes.

MR. ALLEN: Yes. And I think John hit the name on the head there. When this was originally put out and issued by White Paper, it was for the purposes of the TBD-6000 review. So that analysis centered on TBD-6000 airborne, because that's what would be used in that.

So then the question comes up, is that 30 days appropriate for a site where we actually have airborne data and we'd be using that and not --

DR. MAURO: Bingo. That's the whole ballgame right there.

CHAIRMAN ZIEMER: Okay.

MR. ALLEN: I don't disagree with you, John. I think that hasn't been addressed in any paper or anything, and I think the results -- if it ends up being something different, the results I think, as far as TBD-6000 would be, is to just put some sort of caveat in there saying this is only applicable

for TBD-6000, you know, or something to that effect.

DR. MAURO: Yes.

MR. ALLEN: But I will try to do all of the analysis I can anticipate, put it all in as brief a White Paper as I can, and hopefully we can discuss this during the next meeting.

CHAIRMAN ZIEMER: Okay. That sounds good. Any questions on that? Josie, are you okay with that?

MEMBER BEACH: Yes. Well, I just have -- the last bullet on SC&A's White Paper talked about the GMs in Table 7. Will this take care of that?

CHAIRMAN ZIEMER: I think that's separate, but they are correct now, right, Dave?

MR. ALLEN: Yes. We admit that is a mathematical error in that table, and we will correct that with the next revision of

TBD-6000. I would like to get this 30-day settling thing sorted out before we undertake any kind of revision.

MEMBER BEACH: And then, the only other question I have -- and I know this is probably already covered somewhere, but I just wanted to make sure, we talked about floor sweepings and we talked about the uranium chip fires. Are those assumed to be the highest level of dust at GSI? And you feel that's covered for activities that occurred there?

DR. MAURO: Maybe I could help on that. This is John. Keep in mind that at GSI we have elected to use the surrogate data from real facilities that handled uranium in a way that we believe that -- NIOSH did, in a way that is believed to be similar to the way uranium is handled or was handled at GSI. So it's purely an empirical number.

The degree to which those data from the -- and it's a good question. The

degree to which the data from real facilities that handle the uranium in a similar manner, as best we can tell, to GSI, that's what we've got.

Now, you're asking the question, well, does that real data from these other facilities capture the full range of types of activities such as sweepings, et cetera, that might be important? And the answer is I guess we -- you know, we are taking the data on face value, and they are using the 90 -- well, we're going to get into this in a minute.

But they are using a 95th percentile value, which I guess my first reaction, because I haven't thought about the question that you just asked, and it's a good question, but I think that the fact that NIOSH is operating with -- given the surrogate data that they are using, by picking the 95th percentile value, it is likely that that captures these transients and that could drive

the number high for some short period of time.

So, I mean, that would be my sense, that by picking the 95th percentile you accommodate these uncertainties in the data set that is being used for the -- as the surrogate data.

MEMBER BEACH: Okay. Thanks, John.

DR. MAURO: Okay.

CHAIRMAN ZIEMER: Okay. Any other questions on that at this point? This will be, then, revisited once we see the White Paper and the response to that. So are we good to go on to the next agenda item, which is GSI?

(No response.)

Okay. We will do that.

DR. McKEEL: Paul?

CHAIRMAN ZIEMER: Yes.

DR. McKEEL: Dr. Ziemer?

CHAIRMAN ZIEMER: Yes.

DR. McKEEL: This is Dan McKeel.

CHAIRMAN ZIEMER: Yes, Dan.

DR. McKEEL: I know this is not the time allotted for us, but I have something that is very germane to the points that Josie just brought up and John Mauro just mentioned.

CHAIRMAN ZIEMER: Yes, go ahead.

DR. McKEEL: Can I make that comment, please?

CHAIRMAN ZIEMER: Oh, sure. Sure.

DR. McKEEL: One of the papers that I submitted was I also reviewed Adley '52, and one of the major findings that I felt had been overlooked in that paper was -- and this is in answer to Josie Beach's question.

I also thought that the sweeping data showing elevated MAC concentrations above the acceptable limits had not been paid enough attention to at GSI. But the other thing that was probably even more important and more significant and more striking about Adley '52

was the data they had on unloading uranium, cold uranium, from freight cars, and of course that is exactly what happened at GSI when they had to unload the Mallinckrodt uranium from both freight cars and trucks.

But Adley goes into great detail showing that it took seven men to unload uranium from freight cars at the Hanford melt plant, that they had to restrict their time doing that job, because the doses were high, and that it required workers from two different departments at the plant.

So unloading freight cars has been totally ignored at GSI, and I think it's a major undetermined exposure route for GSI yardmen, and the people who actually had to go in there and unstack or unload the uranium, put it on some kind of a transport vehicle, take it to the loading dock, weigh it, and so forth.

So I would say the freight

unloading tables, which are highlighted in my paper, should be paid more attention to.

Thank you.

CHAIRMAN ZIEMER: Thanks, Dan. And, actually, when we get into the next series of presentations and under Item -- actually, it would be Item D, when you have a chance for additional comments, I have some questions on the Adley information as well that relates to what you just talked about.

We all have a chance to return to that. I appreciate you bringing it up, though.

Okay. Item A under 3 is just the report of the technical conference. And I just -- that was the May 28th conference. There is a one-page summary that was distributed.

I just want to ask -- I don't know, Ted Katz, I think you put the summary together for us. Do you have any comments on

the summary? And then either DCAS or SC&A, any other comments on the summary in terms of if you felt it captures what the discussion was about.

MR. KATZ: Hi, Paul. This is Ted. No, I mean, I don't have any comments on the summary. I was just serving as secretary in effect for that conference to record, and then I did distribute it to all the parties and heard back from almost everyone. Everyone I heard back from said it was a reasonable summary of what was covered.

But I put this on the agenda, so that the participants in the leads, whatever, from SC&A and/or from NIOSH could just speak in any more detail that they want to about that discussion before we get into the actual -- the White Papers and the public comment submissions, and so on, SC&A review of the public comments for this meeting.

CHAIRMAN ZIEMER: Okay. Thanks,

Ted.

Well, let me ask either Dave Allen, Jim Neton, any comments from NIOSH on the summary?

MR. ALLEN: This is Dave Allen. I don't have any comments.

CHAIRMAN ZIEMER: Okay. And how about SC&A?

DR. MAURO: This is John Mauro. I thought it was fine and accurately characterized and what we discussed.

DR. ANIGSTEIN: And Bob Anigstein. I also agree.

CHAIRMAN ZIEMER: Okay. Thank you.

DR. McKEEL: Dr. Ziemer, this is Dan McKeel again.

CHAIRMAN ZIEMER: Yes, Dan.

DR. McKEEL: Again, I seem to be the lone dissenter that that summary was all fine. So may I make my two short comments

about that now?

CHAIRMAN ZIEMER: Sure.

DR. McKEEL: Okay. So my comment is that the gist of that meeting, the main point of that meeting was to bring up a brand-new method for determining intakes, the square function approximation. It had never been talked about before. No paper has been published about it.

Now, Dave Allen did publish a paper about that several days later. So my question was, I thought that the issues to be discussed at the technical meeting had been defined at the 4/26 Work Group meeting, and then I find from the summary that a brand-new method was brought up and discussed.

I also want to comment that that summary had two other things that concerned me greatly. One was I had asked specifically whether TIB-70 would be discussed at that meeting, at the technical meeting, and Ted

Katz had assured me that, no, it would not be, and yet the summary indicates that it was at least touched upon.

The second question -- second issue is that at the last bullet point in that summary is that Ted Katz actually asked a question about production workers and numbers of hours of labor, and so forth. And that certainly is not the ordinary function of a secretary taking minutes of a meeting.

And I just needed that to get on the record, that it seems to me that if you were listening to that call, Dr. Ziemer I'm talking about, as a silent observer, not participating, that it seems very odd and inappropriate to me that the DFO, who is not really a technical member of the Work Group for technical issues, that he was actually participating actively in the technical call. So that would be my comment.

CHAIRMAN ZIEMER: Okay. Thanks,

Dan. Let me make a couple of comments on what you just said. Number one, the so-called square function actually is the function that had been proposed by Dave Allen previously. It was not -- that description of it wasn't used, but that is exactly what the function was that we had been discussing in the last Work Group meeting.

It was a square function. I think they adopted that terminology when they recognized what it was Dave had been describing. The point of the call was for folks to understand each other's models, and it became clear that the model we had been talking about, in fact, it's -- we thought in the previous Work Group meeting was in fact a square function, and they started calling it that.

So it wasn't a new proposal. It was exactly the same set of --

DR. McKEEL: Are you talking about

the triangular distribution?

CHAIRMAN ZIEMER: No, I'm not. I'm not talking about the triangular distribution. This was only --

(Audio cuts out.)

DR. McKEEL: Dr. Ziemer, I can't hear you.

(Pause.)

COURT REPORTER: This is the court reporter. Can anybody hear me?

DR. McKEEL: I can hear you, but the other Members are cut off.

MEMBER POSTON: I can hear you. I'm on --

MEMBER BEACH: I can hear you as well. I think it's just Paul's phone.

DR. NETON: Yes. Paul dropped off for some reason.

MR. KATZ: Right. He'll realize it, I'm sure, and come back to us in a second.

(Pause.)

COURT REPORTER: Just confirming one more time -- this is the court reporter -- am I being heard?

DR. McKEEL: You are being heard.

COURT REPORTER: Okay.

DR. McKEEL: Yes.

(Pause.)

CHAIRMAN ZIEMER: Okay. I got dropped somewhere along the line.

MR. KATZ: Paul, this is Ted. So you had just finished explaining that the square function was not actually a new method whatsoever, but -- and that's -- you dropped off right after that, so --

CHAIRMAN ZIEMER: Oh. Well, then, the other thing I was pointing out was that OTIB-70 per se wasn't discussed. It was simply mentioned as the fact that it would need to be discussed at the next Work Group meeting. They were going to get into the issue of the deposition modeling and the

number of days to determine that during the residual period some -- someone just pointed out that that would have to be discussed in the Work Group.

So, in my mind, OTIB-70 wasn't discussed, but simply pointing out that that part of the issue would have to be a Work Group discussion.

And then, I said as far as the DFO's comments, you could --

(Audio cuts out.)

MR. ALLEN: Okay. Now this is Dave Allen. Can anybody hear me?

DR. McKEEL: Yes, I can.

PARTICIPANT: I can hear you, Dave.

MR. ALLEN: Okay.

MEMBER BEACH: So can I.

MR. ALLEN: Ted, are you on the line?

(No response.)

MEMBER BEACH: Boy, this is odd today.

DR. NETON: This is Jim. I'm here, but we've apparently lost Ted and Paul.

MR. KATZ: So you didn't lose me. I was doing what everyone else does and speaking into a muted phone.

So, Paul, are you on the line?

(No response.)

I'm thinking we lost Paul again.

DR. GLOVER: Ted, one thing we were hoping to find out is perhaps Joslyn and Simonds could call in after lunch, or do you think we need to stay on through the GSI discussion?

MR. KATZ: Oh, yes. No. So, Sam, I think that would be fine. There's no way we are going to get through GSI before our lunch break. So, Sam, I think it should be comfortable. For that matter, it seems like someone could just pop you an email, Jim or

someone, when you are coming up, your item.

DR. GLOVER: Okay. So --

DR. NETON: I can do that. It would be Tom Tomes for Simonds and Sam for Joslyn. I can let them know.

DR. GLOVER: I'll plan on signing in sometime after 1:00.

DR. NETON: Yes. Just make sure you guys -- both Tom and Sam you stay near your office, so that when the time comes you are ready to go.

MR. TOMES: That works for me. This is Tom.

DR. NETON: Okay. Good.

CHAIRMAN ZIEMER: I got blocked out again, but I'm back. Sorry. I've been having phone trouble here.

Where are we at, Ted?

MR. KATZ: Okay. Paul, so I think I spoke into mute, and you dropped off sort of concurrently, but I think, Paul, you asked me

to address the third item as to why I would ask a question --

CHAIRMAN ZIEMER: Right.

MR. KATZ: -- during the Work Group meeting -- I mean, during a technical call. Or we could say for Work Group meetings, too, because I do that in Work Group meetings as well. And I ask questions all the time when something is unclear to me.

I have multiple roles here. I am both the DFO for the Advisory Board, and I am also the contract officer's technical representative for the contract with SC&A, and serve as staff director in respect to that, the staff for the Board.

So I ask questions all the time. It is perfectly appropriate, and that's really all I need to say about that I think.

CHAIRMAN ZIEMER: Okay. Thank you. I think we are going to go ahead now to the White Paper and --

MR. KATZ: Paul?

CHAIRMAN ZIEMER: Yes.

MR. KATZ: Oh, okay. I'm sorry. I thought we lost you again.

CHAIRMAN ZIEMER: I heard some beeping. I wasn't sure what was going on there.

We have two White Papers from DCAS. Dave Allen was the author, and, Dave, do you want to give us a quick summary? Those are fairly brief papers. The first one was the dose estimate for employees not routinely working in the production areas.

And this was the issue we were talking about, of what would the dose assignment be if in fact you could identify people who were not normally working in the production area but who might have occasionally visited the production area, so -- and the other one had to do with the -- what is now being called the square function

for estimating the inhalation intakes.

MR. ALLEN: Okay, Paul. You wanted to take these in series, right? Just start with the --

CHAIRMAN ZIEMER: Sure. Sure. Do them both, and then we'll have the SC&A responses, and then we'll have a chance for the Petitioner to also make comments.

MR. ALLEN: Okay. As you said, the first one is the -- what I was asked to do at the last Work Group meeting was to -- we discussed an exposure estimate for people not routinely working in the production area. I think we were loosely calling them admin workers, but it's really for anybody not routinely working in the production areas.

And we had a short discussion of using a previous estimate, but it was clear that some adjustments were going to have to be made. So as a result I wrote this White Paper and sent it around.

One of the issues with the previous estimate -- previously, we put somebody at a boundary all the time at -- previously, we assumed there was a boundary that was placed one and a half times the required distance from radiography occurring out in the plants, away from the radiography room.

And the previous estimate had somebody standing at that boundary all the time the radiography was going on, with the exception of 10 percent of the time they were actually walking through the boundary -- the roped-off area.

There was issue taken with the one and a half times that -- there is no solid evidence that that occurred, and so we backed the boundary back up to the two millirem per hour area. And that caused the -- I'm sorry, we shrunk it to the two millirem per hour zone, which causes the dose rate at the

boundary to increase, but also shrinks the size of the area that is roped off, and that changes the amount of time somebody is walking through the area.

So all the numbers had to be changed, even though the concept was, you know, essentially the same. Other changes were that previously it was -- assumptions were made assuming somebody was routinely working in the production area. And so the bounding time was going to be always right there by the radiography.

Now, with this estimate, since this is essentially admin workers or people that are not routinely in the production area, the 100 percent occupancy seemed to be a little too conservative. So we made the -- we changed the assumption to 25 percent of their time they are in the production area, and we made the assumption that they walked through the boundary, under the rope, and on through

the boundary, made one round trip per shift, each and every shift, during radiography.

When we put those together using the same techniques we used before, the result ended up being a grand total of 571-1/2 millirem per year for these essentially administrative workers.

Did you want me to put any more detail in there, or is that sufficient, Paul?

CHAIRMAN ZIEMER: I think that's sufficient for me. I don't know, Josie, did you have a question on that?

MEMBER BEACH: I guess for me I can understand why you may have hit that 25 percent mark, and it said they would walk through twice per shift. And that's probably going to cover a portion of the admin personnel, but I think there's an upper end to that personnel that we might not be capturing here. That's just my only comment.

CHAIRMAN ZIEMER: Okay. Just to

follow up on that a little bit, are you thinking, Josie, in terms of more time in the plant, or an admin person --

MEMBER BEACH: I think -- yes. Sorry, Paul. I think we have heard that some of the admin folks actually had offices in the production areas and spent more time -- this seems like a lower end or a lower --

CHAIRMAN ZIEMER: Yes. Let me comment on that, and maybe Dave will as well, or even Jim Neton. But my understanding is, if we're calling them an administrative person, they can't -- if they have an office in the plant, they are going to be characterized the same as the regular radiographers and other layout people.

These are people who you are able to confirm did not have a location in the plant. And if you can't confirm that they didn't, then you have to assume that they did. So, in my mind, it's got to be -- it's going

to be a very limited number of persons, because you have to be able to identify, probably through a CATI, that they were not located in the -- what we are calling the radiation envelope.

If they had an office in there, then they are not an admin. And that was my understanding. Dave, is that what your approach was on this?

MR. ALLEN: Yes. That's certainly the intent. We have glanced through the records we've got. We haven't done a detailed analysis using these criteria. But, you're right, it's going to be a very small number of people.

DR. NETON: Yes. Actually -- this is Jim -- I've gone through the case loads, and there are almost very few people that would qualify for this. Everyone else would be considered radiographer. I mean, very few.

MEMBER BEACH: Okay. Then I'm

satisfied with that.

DR. NETON: It really boils down to something like, you know, a secretary-type position that was on payroll. You know, they would walk through the plant, but very rarely.

But the other job categories are somewhat ambiguous, I have to say, in looking through them. And you couldn't really say with any confidence that they didn't have some function to walk through the plant, you know, or have an office there.

CHAIRMAN ZIEMER: In which case they would be counted with the radiographers and the other -- in the envelope.

DR. NETON: That's correct.

CHAIRMAN ZIEMER: Okay. Dave, why don't you proceed with the other -- the square function approximation.

MR. ALLEN: Okay. The square function approximation, as we have started dubbing this thing, and I put it in paper,

that grew out of -- well, frankly --

DR. ANIGSTEIN: This is Bob Anigstein. I just want to interject a comment, that it just so happens that it's coming out a little over 500 millirem a year. And that was the limit for non-occupational exposure that was in place during most of the GSI operating period, starting somewhere in the late '50 when they -- when the revised 10 CFR 20 came out. So it just, by coincidence, happens to be hitting that number.

CHAIRMAN ZIEMER: Okay. Thanks, Bob.

Go ahead, Dave.

MR. ALLEN: Okay. The small background is previously I put together a White Paper with the estimate how we would do the airborne estimate, using the 95th percentile, the surrogate data that we had already agreed on.

SC&A, in their response, raised a

question about the airborne not instantaneously ending. It would slowly deplete over a little bit of time, and they weren't convinced that that piece was accounted for. That part wasn't -- exactly what their concern was wasn't clear to me, and that was the purpose of the technical call we had.

And the technical call, I tried to summarize that towards the end, that that was, you know, the concern or at least, you know, one of the concerns. And I think John Mauro, at least, agreed with that. So I agreed during that that I would put together a White Paper, because it was going to be too complicated to just discuss on the telephone during a Work Group call.

So I put a White Paper together, essentially, with the mathematics that integrate the exposure as the airborne integrated over time. If you were to assume

the airborne was instantaneously at its high level and instantaneously dropped off after the operation compared to the more realistic buildup versus decline afterwards.

And Attachment 3 -- or, I'm sorry, Attachment A of the White Paper was essentially the mathematics behind pointing out that that was mathematically equivalent. And the rest of the White Paper essentially just points out the -- what that means is what it amounts to, and various removal rates, et cetera, and what that would mean and showing that it's either accurate or conservative. It's accurate over infinity. It is conservative the longer the removal rate is.

Did you want any more on that, or is that sufficient?

CHAIRMAN ZIEMER: For me, that is sufficient because I've read the paper and gone through it. Let me ask Josie if she has some questions on that at this point.

MEMBER BEACH: No. I just went back to the fundamentals of what sites did you use, because I know this is all surrogate data, what starting points. That paper didn't really address any of that. It was just the mathematical end of it.

CHAIRMAN ZIEMER: Right. Exactly. This is really the issue of: does this approach give a useable or realistic estimate of the situation where he has gone up as an instantaneous value of air concentration and then dropped back off instantaneously, versus what SC&A was talking about which was the buildup and then the depletion.

And I think the attempt here is to show that this square function actually ends up, if you go out, integrate to infinity, the area under the two curves are the same.

But SC&A actually analyzed that, so let's get their responses.

Let's see, SC&A, do you want to

first talk about the dose estimate to the admin, and then talk about the square function?

DR. MAURO: Yes. This is John Mauro, and I'll start it off.

CHAIRMAN ZIEMER: John, before you start, on your doses to the, quote, "employees not routinely working in the production area," is there an error on your equation in terms of the decimal point?

DR. MAURO: Yes. We discussed that, and that is correct. We did make an error originally when we looked at this thing. I guess if we take the first paper first, you know, we reviewed it and we agree there was an error.

And, Jim, do you remember the last time we had our conversation? You had pointed out that we made that tenfold error, and you were correct. And I think, right during the meeting, you know, we quickly checked it, and

you were actually right. There was an error there.

CHAIRMAN ZIEMER: Yes. It showed up in my copy of your June 4th memo.

DR. MAURO: Well, there is a -- well, right now I'm looking at, let's see -- I'm looking at the June 3rd memo. Hold on. Let me go to the June 4th memo.

All I really have now officially on the record is SC&A's June 3rd, which deals with this business of the duration that the administrative people might be there, so that's SC&A's position. And we also have what's called a June 11th memo. Those are SC&A's current positions regarding the two issues that we just heard from, the two White Papers.

CHAIRMAN ZIEMER: Well, on that first one, the one that I got from you has a date of June 4th on it actually, but --

DR. MAURO: Okay.

CHAIRMAN ZIEMER: -- the hours times the amount of time per shift -- in other words, it's the 32.50 times the 0.25 times 0.30 times the two mR per hour.

DR. MAURO: Right.

CHAIRMAN ZIEMER: What are you showing for the final value of that?

DR. MAURO: 487.5 mR per year.

CHAIRMAN ZIEMER: Okay. You must have updated it.

DR. MAURO: Yes. Correct.

CHAIRMAN ZIEMER: The memo I got had it as 4,875.5.

DR. NETON: Yes. Paul, I have --

DR. MAURO: Oh, son of a gun, I'm looking at it; I'm looking at it right now, and it's not --

CHAIRMAN ZIEMER: It should be 487.5, shouldn't it?

DR. MAURO: Yep. Yep. I did it again. My apologies, guys.

CHAIRMAN ZIEMER: Okay. Just wanted to make sure that -- so if we're all looking at that paper --

DR. MAURO: Let me do it right now.

CHAIRMAN ZIEMER: I mean, if you take your numbers and multiply them, you get 487.5.

DR. MAURO: Yes.

CHAIRMAN ZIEMER: So your decimal point is in the wrong place.

DR. MAURO: Jeez. Yes.

CHAIRMAN ZIEMER: And in the next paragraph you have it correctly stated.

DR. MAURO: Yep.

DR. ANIGSTEIN: This is Bob. If you look, however, on the -- immediately after that equation, if you look three lines down, it does cite the number correctly.

CHAIRMAN ZIEMER: Right. That's what I just said. In the next paragraph, it

--

DR. ANIGSTEIN: Certainly.

CHAIRMAN ZIEMER: Okay. Just wanted to clear that up. Go ahead, John, with your --

DR. MAURO: Okay. In light of the -- we completely agree with this two-pronged approach for sorting the people between administrative and the non-administrative people, and the fundamental assumptions that are being used, the 25 percent and the 30 percent.

So we're fine with it. We're fine with the number. And the conversation that you just had where David and Jim clarified a question that I had is, you know, when you do the sorting, you know, how is that -- you know, who goes into which box, it sounds like you are -- as I mentioned before, you are creating a relatively big tent for the people who are going to be at the -- what we will

call the radiographer category.

So we have no comment. We support it. We concur that this is the right solution to reconstructing the doses to workers, both administrative workers and what we'll call, quote, "radiographers."

So, I mean, we are okay with that. And, quite frankly, I probably want to correct this error that's in the memo and get it out, because I don't like to have erroneous numbers in one of our reports. But as far as I'm concerned, SC&A's position is this issue has been resolved.

CHAIRMAN ZIEMER: Okay. Then, go ahead with the next item, which is the square function.

DR. MAURO: Yes. Now, the square function, we had our mathematicians, had both Bob Anigstein -- and I'm sort of like speaking for the crew -- and Steve Marschke independently check the mathematics.

And we concur -- in fact, if you folks have the report that we prepared and submitted, and it's dated -- my version is dated June 11th. That's the official version that I believe is also available to the public. And in effect the solution, which we actually call elegant, for treating what is the airborne dust loading expressed in terms of becquerel-seconds, the time-integrated exposure.

I think the mathematics and the approach to solving this problem is correct. We agree with it. The only -- now, there are two things that we probably want to bring to the attention of the Board, of the Work Group. The mathematics is perfect for this solution to this cycling issue that we have before us. So the square wave function is mathematically correct.

The difficulty that NIOSH will have, and perhaps should be talked about a

little bit, is in the equation we believe that the peak -- you notice in that Figure 1 there is -- it is climbing to a peak and then it drops.

This is the -- basically, the concentration as a function of time from first principles, going up, and then after the handling stops, it goes exponentially down, and then you integrate under the area of the curve, and then you get the becquerel-seconds that the workers are exposed to from each shot. I called it "campaign" in here, probably should have used the word "each shot."

And then you multiply by the number of shots, and you've got yourself what the time-integrated exposures are to the workers from the handling operations, while you are handling the ingots and slices.

The challenge that I think we still -- or the issue that -- regarding this

model is now, what is the value -- and they referred to it as T1, and I believe they have selected -- NIOSH has selected 15 minutes as the correct value, which I believe the way you could look at it is a certain fraction of the time -- I think it's about -- the max hours is about 400 hours per year, is when these kinds of activities took place. And that is based on records that we have starting in around 1958, I believe. And that, based on those records, 400 hours per year, I think, is the contract.

DR. ANIGSTEIN: John?

DR. MAURO: Yes, please, Bob. Help me out, sure.

DR. ANIGSTEIN: It varies year by year.

DR. MAURO: No, I understand.

DR. ANIGSTEIN: Four hundred thirty-seven was the highest peak year, and then later on it goes down to a much smaller

number.

DR. MAURO: Okay. No, thanks for clarifying that. So we do have -- but that's the -- now, some fraction of that time in a given year is when the material is actually being handled. And as I understand -- and, Bob, please help me out if I misrepresent some of this information -- that 15 minutes -- effectively 15 minutes out of every hour is --

DR. ANIGSTEIN: Out of every 75 minutes.

DR. MAURO: Thank you. Out of every 75 minutes, the ingots and slices are being handled. So this term in the equation called T1 is 15 minutes.

Now, that is -- in principle, what's being said is that when you have your -- let's say we are dealing with an ingot, and it's brought into the radiography room. There is a certain amount of handling that is necessary to set it up for a shot, and then

the shot is taken, and then you finish up and you move it out.

And the idea being that I guess 15 minutes -- the whole -- out of the 75 minutes, 15 minutes is the time of the handling. One of the things that we are concerned about is the very same thing that was brought up by Dr. McKeel. Does that 15 minutes out of the 75 minutes, that fraction of the time, the T1 in the equation, capture any other handling?

See, the way I look at it is the time period while the ingot is being handled, for the purpose of radiography, is part of the time it's being handled. But it's also being handled when it arrives by truck or train or however it arrives and is offloaded, and then it is transported within the facility. I'm not sure if it's transported indoor or outdoors.

And then it might actually be placed in some staging area prior to it being

radiographed. Then, of course, it goes through the radiography, and then after the radiography, which might be an iterative process, it then, you know, leaves the radiography room, perhaps going to some holding area before it is returned to Mallinckrodt.

So in my mind, there is this uncertainty in the amount of time that the ingot or the slice is being handled, and whether the 15-minute number, as selected here, does capture the full -- appropriately, in a claimant-favorable way, the time period over which the dust is being generated from handling.

So that's a question we have, and we have one other issue, and then -- I just want to talk about that one first, because we have one more issue related to this approach, and it has to do with the time period when it's not being handled and there is

resuspension going on.

So what we are really looking at with this curve, this is the dust loading, the time-integrated dust loading in the air as a result of the handling. But superimposed on this, in addition to this, is that there is a buildup and some level on surfaces as a result of this handling that settles on surfaces, which becomes a chronic source of airborne activity that is there virtually the rest of the time, you know, during this time period.

I'm going to talk a little bit about that. And we feel that the problem with that part, which is not discussed in our review here, but what you are really doing is you are superimposing this square function, as I understand it, on top of some baseline dust loading that one would call the baseline dust loading due to resuspension from the accumulation of the dust.

And it seems to me that that

approach -- what we have here is an attempt to be mechanistic, which is good. In other words, this square function is a way to be mechanistically faithful to the handling. And we believe if you could pick the right T1, we have nailed it, and we've got the right way to predict the airborne exposures from the handling operations.

But now in addition to that, you have to add to that the additional exposures between the handling operations when any accumulated uranium on surfaces might become airborne.

Now, the approach that is used there is a simplistic approach that is bounding, in that you are assuming you achieve some equilibrium level based on the upper 95th percentile surrogate data, and that that level just stays constant as I understand it, and you use a resuspension factor of 10 to the minus five.

So you've got these two sources of exposure, the resuspension contribution and the handling contribution. I would argue that if we were confident that the T1 number representing the time that it is being handled is in fact claimant-favorable and does capture the full range of handling operations while the ingot or slice is onsite, you've got yourself the optimum model.

But given -- right now we are not quite sure whether you can nail down what that value is, that T1 value is, because of the kinds of questions that Dr. McKeel raised, so we are -- in our view, we are almost home in terms of solving this problem.

And all I can offer is that if for some reason the T1 number becomes a difficult number to track, and it might be much more than 15 minutes, we would argue -- and go back to Bob Anigstein's original strategy is that, well, once that T1 value becomes longer and

longer, in effect you end up with Bob's model, which is -- just goes straight to the surrogate data. You pick the average concentrations out of the surrogate data and assume it's always at that level for everyone all the time.

And what that does is -- and we are arguing that if you do have trouble picking the T1, and if you do have concerns regarding what the exposures might have been pre-1958 when we don't have data on the number of hours that was in the contract, if you have trouble trying to come to grips with that, Bob's approach solves those problems. But it does end up with probably something that is fairly conservative, and the doses would be about 10 times higher than this approach.

So what we're saying is that I think that your model is great, if you could pick the right T1 that we could defend.

DR. ANIGSTEIN: And if we -- John,

and we have to fill in the dark years.

DR. MAURO: And fill in the dark years, with the dark years being '52 to '58.

DR. ANIGSTEIN: Right.

CHAIRMAN ZIEMER: Okay. Thanks, John. Actually, I had a similar question on the T1 value, particularly stimulated by the issue of unloading of the rail cars, which were mentioned in the Adley report. I don't know that it would require the same number of people, because they may have had a much heavier load of material in the Hanford case.

But in any event, are we accounting for the other handling that -- and, John, you have raised that question, and it raised a question in my mind after revisiting the Adley material.

So I have -- Dave or Jim, could you at least initially speak to this issue?

DR. NETON: Yes. This is Jim. I've thought about this quite a bit as well,

and, you know, in listening to the various arguments against the 15 minutes. And I agree that we don't know that number with sufficient accuracy, I think, to nail it down at the 15-minute level.

And it seems to me -- I was willing to actually propose -- and I'm not sure this would fly, but that we would use just the total number of work hours in a year as the total exposure, to cover the scenario such as the unloading and the movement throughout the plant.

But I'm hearing now, though, that that -- you know, that the so-called "dark years" now is not really agreed upon, when in fact we have been going on that assumption from the very beginning, that we could estimate the number of work hours in a year.

So I would be happy to compromise between, you know, Bob Anigstein's 3,250 hours per year, whatever it was, and say it would be

the 95th percentile for the number of contractual hours in that year.

DR. ANIGSTEIN: Yes. Let's see, just doing it in my head, the approach that we proposed -- I hate to sound like I'm the lone wolf with the SC&A approach, and that was the -- something like 22, 24 was the average, and 69 was -- 68 was the 95th percentile. So we're talking, roughly speaking, a factor of three.

So my approach goes down a factor of three on the concentration, and then it goes up on the hours, and so that's -- yes, you know, we could probably live with -- speaking for myself, and I think John will agree, we could probably live with that. What do you think, John?

DR. MAURO: Yes. I like the idea of conversion, because T1 is going to be a struggle. And if there is a way around --

DR. NETON: Yes. There is no good

way to nail it. I mean --

DR. MAURO: Right.

DR. ANIGSTEIN: And then, if we go with the maximum year, which I think was '61, from June '60 to June '61, if we go with the maximum year, and assign that to the years -- the plant years, you can say that, look, we've got data from '58 through '66, so we've got something like eight years' worth of data, and then we use the worst of those -- but this is sort of like a co-worker approach, a cohort approach, where you say if you don't have data for a given worker, but if you assign him the worst of the badged workers, chances are he's not going to be any higher.

And, particularly, if the years are a smaller -- in other words, less than half, so if you assigned the highest year to those dark years, chances are it's pretty good. Maybe it's -- there is no reason to believe that they would have had a higher

level, because, actually, if you look at the purchase orders, the very first one in '58 is slightly lower, and then it comes to a peak.

If we had a constant decrease, I could say they were higher before. But since you have a hump there, then it goes down, I would be comfortable with assigning that, you know, I think a reasonable -- is that -- would you agree, John?

DR. MAURO: Yes.

DR. NETON: Well, I think that actually ends up solving the residual, the resuspension --

DR. ANIGSTEIN: No. The resuspension now -- oh, yes. And then we will leave the resuspension.

DR. MAURO: Yes.

DR. ANIGSTEIN: Yes. We'll leave that.

DR. NETON: You can just assume the work occurred in the first 400 hours of

the year. This is -- you know, you drop it down --

DR. ANIGSTEIN: Sure.

DR. NETON: -- and then you resuspend it the rest of the year.

DR. MAURO: Okay. Okay. We're okay with that.

CHAIRMAN ZIEMER: What I'm going to suggest here is that we get something formalized by NIOSH as -- sort of along the lines of what we've heard, and then SC&A can respond to that formally.

But before we commit to that fully, we do want to hear the input from Dr. McKeel and others representing the site as well in terms of the concerns they have about both the models and the input of values and that sort of thing.

So now I'm wondering if we need a break first. We're in different time zones, so for some it's maybe lunch hour, for others

not. But do you want a brief break at this point, or should we just continue? How is everybody doing? Any need for breaks, or are you in locations where you can take breaks as you need them?

DR. NETON: This is Jim. I'm fine.

CHAIRMAN ZIEMER: Okay. Maybe we'll just keep going, then.

I'm going to ask Dr. McKeel if you want to go ahead now and speak. You can, Dan, speak to both the White Papers and the responses and the related issues as we have discussed here.

DR. McKEEL: Okay. That would be good. Thank you very much. Maybe I'll talk about the administrative dose paper first. Is that all right?

CHAIRMAN ZIEMER: Yes.

DR. McKEEL: Okay. So I really have two items to mention about that. The

first is that I had written to the Work Group and Dr. Ziemer earlier in June and asked some questions, including some statistics that might be provided by NIOSH on trying to establish whether Dave Allen's comments to the Board before the final vote on December 11, 2012, in Augusta were actually accurate, that almost everybody at GSI under Appendix BB, Rev 0, had been assigned the higher dose scenario, which would have been for that document the radiographer dose.

Stuart Hinnefeld did write me back yesterday, which I appreciated, and he gave me the following statistics, which I have put into the record. I find them quite odd, to be honest with you, but at least it's a start.

So my question -- my original questions were, what percentage -- what was the number and percentage of the total dose reconstruction assignments that had been given to radiographers that got the highest dose,

and what was the number and percentage of non-radiographers that got the same highest dose?

Actually, so a pretty straightforward question. So the answer I got back was that he analyzed 252 total claims from GSI, and these were from the operational period only, not the residual period, because radiographer, Stuart said, didn't apply to that period.

So there were 166 radiographers was the way he listed it, 82 other, and four with no external estimate, and, in parentheses, partial dose reconstructions.

So I assume those four people, since GSI doesn't have an SEC, must have been people who were employed both at GSI and a site that does have an SEC and they were pulled for that reason and underwent partial dose reconstruction.

So if you add the 186 -- I mean, the 166 radiographers, the 82 others, that

comes to 252 total claims, of which 65.9 percent, or about two-thirds exactly, were assigned the highest radiographer dose.

Now, the thing that is interesting about those numbers is that in the Landauer GSI 2084 program there were badges in the NIOSH and the SC&A data sets, the weekly ones. There were only 89 known badged radiographers that even were at GSI at all during the operational period.

And the seniority list that I have from Terry Dutko, who is a deceased betatron operator, that he and another supervisor there, [identifying information redacted], had filled out, they came up with approximately 61 people that were badged in 1964 and '65.

And Terry separately had generated for me, and shared with the Work Group, that he was aware from the polling he had done among the living workers that they could only come up with 11 certified betatron isotope

radiographers that had filed claims with Department of Labor.

So that's -- so, you know, depending on which of the -- so if we said, let's say, 11 -- and I think Dave Allen in his earlier paper where he estimated the number of people who might be called radiographers, he turned up 23, and of those he was pretty sure that 12 of them were radiographers.

So let's use that conservative 12 number. So that means 154 people who are not radiographers were assigned the highest radiographer dose, and 82 others were assigned the lower dose level specified in Appendix BB, Rev 0.

My question of course is: how was it decided in all of those claims, among the non-radiographers, who was to get that highest dose and who was to get the lowest dose?

And so if I were a non-radiographer that got the highest dose, I

might say, "Well, I got a favorable reading and that's good." And the 82 others might say, "Gee, I work side by side."

Now, what we don't know is: among those non-radiographers who got the highest dose, what jobs did they hold, and what jobs did the 82 others hold. And Stuart Hinnefeld mentioned in his reply to me yesterday that NIOSH had gotten the list of 163 union jobs at GSI that John Ramspott had sent to them many years ago.

So I guess I would say that it sounds like -- number one, I would comment we need more breakdown on those particular people. The 166 radiographers included radiographers and a whole bunch of other job categories, and it would be important to find out what exactly they were. And that would also go for the 82 others that got the lower dose assignments.

The other comment I wanted to make

was about Dave Allen's paper on the administrative dose itself. And just to be clear for the record, that was a three-page paper in May 2013 called "Dose Estimates from Radium Radiographers to Employees Not Routinely Working in Production Areas."

I was happy to hear this morning that NIOSH agrees that it will be very, very difficult -- to me probably impossible -- to determine the people who stayed in the administration building, in the office, weren't located in the plant, and basically rarely, if ever, made trips through the production areas of the GSI plant.

I just don't think there are data to be able to do that. I noticed Dave Allen said that they would operate from the CATI interviews, and then he goes on to describe how he actually -- to ferret out the radiographers, and so forth, he actually used the claims database. And that triggered to me

something that came up in 2006 at a NIOSH-sponsored workshop on dose reconstruction that I was invited to.

Now, I asked the question back then, which was, is there a systematic database that extracts key data from CATI interview fields and puts them into the database, so that that total database can be queried for CATI-related information?

And I think that is very important because on the CATI documents that are now posted on the DCAS website you can see that one of the CATI interviews, the longer one for the workers, has a question in there about whether in fact the person was a radiographer or worked in radiography. So that would be a much more targeted question.

And, you know, presumably, if people had not worked at that, they would answer no to that question. And if they had worked as a radiographer, they would answer

yes.

So I didn't understand why Dave didn't just go on and use the CATI interview, unless it is very difficult to pull out that data for some reason that I'm not aware of.

So, then, if I may, I would like to turn to the next paper. I would make a comment about the final paper, about the assumptions in the Allen administrative dose paper. And that is, it's clear that the goal is to assign a lower dose to the administrative people than to the production area people. And everybody seems to think that that 25 percent occupancy rate is fine or good or something.

My opinion is it's totally arbitrary. It doesn't -- it is not supported by any facts. It is not something that can be determined for individuals. It is a guesstimate, and so I don't think guesstimates are really fine anywhere. So I don't think

that's a good -- a particularly good number.

And I think Dr. Neton's comment was quite true, that of the people we know that had an office, a small office, sometimes in the administrative building some of them also had offices out in the plant.

And those people, for instance the clerks who would go to follow a job, they would -- some of the clerks would make many forays into the plants to follow up on which castings were being worked on and they would go back to check on how the work was progressing, two or three or more times per day. So making realistic assumptions about those sort of things is fraught with problems.

Anyway, so I'd like to turn then to the McKeel critique of the Allen square function approximation paper. And the first comment is in John Mauro's comments he mentioned an SC&A paper dated 6/11/13. And maybe one of the reasons for my confusion is

that there is no SC&A paper with such a date that is marked on the DCAS website under the discussion papers and I just took off the list today. So that paper is simply not on there.

There is a paper by myself on June 13th, and there is an earlier paper by Dave Allen that is just marked June 2013 on the square function approximation to estimating inhalation intakes. But somehow, the SC&A paper on the same subject wasn't posted on the DCAS website under this meeting, nor was it sent to me by anybody, nor was it mentioned to me by anybody as having been written or turned out.

And I find that very distressing. You know, I'm sure the content of my paper would be quite different, had I had that paper, which I think I should have had. So that's one comment.

The other comment is when we say -- when Dr. Ziemer says that this was not a

new function at all, that that had been discussed before, I wonder if somebody, maybe offline after the meeting, could send me the pages in the April 26th transcript of this Work Group that highlighted what exactly you are talking about.

I don't think it was referred to as a square function approximation, and my question is, what was it called back at those other meetings?

And then, the other issue is, as I wrote in my paper about this paper of Dave Allen's, is as far as I can see this is purely theoretical qualitative modeling. There are no actual numbers attached to the results. And so let's say that we have this theoretical model, which shows that if you integrate the values out to infinity, the two curves intersect.

You know, if you don't do that, the curves do not intersect, and they really

don't approximate each other very well at all. So that's another thing you can see out of this modeling. So I guess I don't quite understand what the point of this paper is.

It seems to me at this very late stage of the Work Group that what we need is an exposure matrix for the different classes of people who are going to be assigned a dose -- the radiographers, non-radiographers, administrative personnel, for all the different kinds of radiation, and integrated for all of the different kinds of sources for internal and external doses.

And I am having a very difficult time integrating all of that information. And I just wanted to mention that it seems to me a qualitative paper doesn't really advance the cause very much. What we need are those exposure matrices with the numbers that everybody agrees to filled in. And if there are numbers that we don't agree with, then

they need to be flagged as well.

And I will just point out that in this Work Group, when John Ramspott and I came and addressed the Work Group in person March 15th of 2012, one of my last slides that I showed that day was an attempt to show the different doses that NIOSH and SC&A had come up with for radiographers and other workers in 2008 when they were first modeled, and in 2012 when they were remodeled after the film badges had been obtained.

And I found that very difficult to do. There was no such summary slide available March a year ago. And it seems to me right now that's exactly what we need in some paper right now, and it seems like that just absolutely needs to get done very quickly, so we all know and have in one place a nice table which says here are numbers that we all agree to, here are numbers that haven't been finalized, and then we can work on getting

those numbers.

So I guess that is my comment, and I assume that Dr. Ziemer wants me to save comments about Adley and so forth, and TIB-70 for later on, which I am happy to do.

CHAIRMAN ZIEMER: Yes. We'll come to that in a little bit. Thanks, Dan, for those comments.

Let me just follow up here a moment on the discussion of the -- what we are now calling the square function. In the transcript, that discussion -- this is the transcript of 4/26, the discussion is between pages 138 and 158. And that -- the word "square function" is not used there. The terminology I think arose during the technical call, but the function, as we're looking at it now, was described in that section of the transcript.

DR. McKEEL: All right. Thank you.

CHAIRMAN ZIEMER: Yes. And then the other thing I did, I pulled up the website, and you're quite correct. I don't see that SC&A three-pager listed there on the documents discussion papers for this meeting.

I wasn't aware that it -- I guess I didn't notice that it wasn't there, and had assumed everything was there, so I apologize for missing that myself.

DR. MAURO: Hello? This is John. When I pulled up that file, I noticed that it's labeled "Not PA-Cleared." So I suspect it's possible that this particular report, which is dated June 11th, in my file right now, which was delivered but it was --

CHAIRMAN ZIEMER: Oh, I have the report. I just didn't notice that --

DR. MAURO: Yes. It's possible that it hasn't been PA-cleared yet to make it to the public, you know, website.

CHAIRMAN ZIEMER: Yes. Which is a

little surprising because there is no use of names in that document. It is all mathematical stuff. It's --

DR. ANIGSTEIN: This is Bob. I think what happens here is just a little administrative glitch where, you know, the report that is sent out by our secretary, production manager I think it, or document manager, whatever her title is, Nancy Johnson. And it is not automatic that everything is PA-cleared. I think it's on request, because we don't want to burden OGC with everything that doesn't need to be PA-cleared.

And I think this was probably a -- it just slipped through the cracks that she probably was not informed, because she is very diligent about doing that. She usually -- and Jenny is very diligent about responding, so usually we get that within a day. If it's late in the day, we get it the next day. If it's early in the day, we get it the same day.

So --

CHAIRMAN ZIEMER: Well, we need to get that distributed.

DR. ANIGSTEIN: I mean, I'm sure it's going to be something that can be done, you know, today or tomorrow.

CHAIRMAN ZIEMER: Right.

DR. McKEEL: That would be very good. Thank you.

MR. KATZ: Yes. This is Ted. I'm not sure what they're -- I mean, Nancy doesn't -- our standing policy is to PA-clear everything except for documents that can't be PA-cleared because they -- by PA-clearing them you sort of remove all of the substantive meaning of the document. So I'm not sure this is up to Nancy.

The other thing I know that is going on is that, you know, I was just informed of this, you know, yesterday or the day before is that they have been having

issues. This is just bureaucratic, but it has to do with which parties are responsible for actually posting things on the NIOSH website, and that process has become a little bit messy currently.

So some things haven't gotten posted. Either they have been sent to be posted in a timely fashion, so I don't know whether that's an issue, too. But all of these things, once they are PA-cleared they are also -- they are forwarded to the SEC Petitioner -- Dr. Kinman. I don't remember his title, I'm sorry, but he is the one who provides stuff to interested parties and that would been done automatically. I can't find it in my records right now quickly.

DR. ANIGSTEIN: This is Bob. In addition to having it PA-cleared, it also has to be made -- before it can be posted, it has to be made 508-compliant. So, again, these are --

MR. KATZ: Right.

DR. ANIGSTEIN: -- two processes, and we always assume the -- I believe the policy at this end -- and I think our instructions are no matter how obvious it is, everything is suspect until it has been proven innocent.

So everything goes through -- everything that is -- if we call it PA-cleared, everything goes through OGC. And then, once it is okayed by OGC, which, you know, usually in a case like that it just comes back saying, you know, no problem, then it gets -- becomes 508-compliant. And even something as simple as a memo, it has the SC&A logo on it, that has to have alternate text because the Acrobat reader can't read it. So there is an extra step involved in making something that is postable.

DR. McKEEL: Right. So, anyway --

CHAIRMAN ZIEMER: Well, we can get

it taken care of.

DR. ANIGSTEIN: I mean, it's easy to be done, but I'm just explaining, you know, what the glitch was.

DR. McKEEL: I can read almost any kind of file if it has been PA-cleared. So anything would be fine, if you could just send it to me directly, please.

CHAIRMAN ZIEMER: Right.

MR. RAMSPOTT: Dr. Ziemer, this is John Ramspott. May I make a comment?

CHAIRMAN ZIEMER: Yes. You certainly may, John.

MR. RAMSPOTT: It's regarding Dr. McKeel's comments and I think John Mauro's, and Dr. Anigstein's, and I believe Josie's. We've got a real problem with the time, the T1. And I'm looking at the exact purchase order that Dr. Anigstein mentioned from 1965, and it clearly states on there, Item C -- and everybody has been using these purchase orders

to figure out ours -- that money that was paid to GSI was for betatron labor charges, including operation and maintenance and all overhead, and it is to be billed at such-and-such an hour.

And having worked in plants when I was going to school and what have you and being in business, we start to talk about overhead, and I, just to doublecheck myself looked up the definition of it. Overhead is heating, lighting, cooling, nothing to do with labor, and it's clear here because it says "betatron labor charges," quote/unquote.

So all of the handling of the uranium before it got into the betatron has not been accounted for, or it would state on there: plant handling, plant labor charges, transportation, whatever, but it's not. So we are missing a very big piece of the handling of that uranium.

And knowing how the uranium got

into the plant, having talked with workers that actually did the handling coming in, they came over in a Mallinckrodt railroad car or a -- it wouldn't be a Mallinckrodt car, it would be Terminal Railroad Association. Those cars never came in the plant.

The uranium would have been unloaded, handled, onto a GSI car, truck, forklift, something with a wheel, as [identifying information redacted], a supervisor of the Yard Department, explained to me. So we are missing a lot of handling by trying to use these purchase orders to determine anything. So I think we've got a real problem there.

Now, there is another time issue that is maybe even bigger than this. The fact -- the three people I think, and I've double checked the transcripts, but if I'm missing something or somebody interviewed somebody else, the three people that are being used, I

guess, to kind of factor the handling of a uranium ingot or a slice at GSI, those three people all started after the radium era.

I looked up their start dates. I have some records that show those. One man who -- well, [identifying information redacted] talked about the ingots and dingots and rotating and shooting corner. [Identifying information redacted] started in 1965.

[Identifying information redacted], who talked about slices, started in '63, September, so almost '64. Mr. Dutko started November '63, almost '64. So none of these people that are being referenced for what went over -- what went on with the ingots or slices or dingots, at GSI had anything to do with the radium era, the early era. We've got a bigger -- we've got a missing timeframe there.

DR. ANIGSTEIN: If I can ask a

question, this is Bob.

MR. RAMSPOTT: Yes.

DR. ANIGSTEIN: John, I agree with you completely about the timeframe of these people. I have noted that myself. But when we are talking about the uranium handling --

MR. RAMSPOTT: Yes.

DR. ANIGSTEIN: -- it makes no difference which era it's in. The only difference there is for the radiography of -- you know, for the incidental exposure, for the exposure of the radiographers to isotope sources. That makes a difference. Whether it's radium or cobalt, these are done very differently.

But the betatron was the betatron, and the only difference was, are we talking about the old betatron building, which didn't -- which was from '52 or on to the end, or the new betatron building, which was completed sometime around the end of '63?

But whether it's the radium era or not, it doesn't matter for the uranium handling.

MR. RAMSPOTT: Well, Bob, you know, I'm not questioning that part of it. The part I was getting ready to question is no one knows what uranium was actually being examined in any quantities. And it does take different times and handling to do different types of uranium.

The slices, they take longer if you are shooting through, you know, the four inches. The ingots and dingots, we all referenced [identifying information redacted] shooting the corners and getting oblique shots in order to get on the film. That's the only way you can do it. Everybody agreed they weren't trying to go through the ingot because they couldn't.

DR. ANIGSTEIN: Right. But that only -- John, that only affects the fraction

of time that the radiography -- you know, they will be setting up as opposed to the time they are in the control room. And now that Jim Neton has agreed that we are not going to divide the time, like 15 minutes in the shooting room and 60 minutes in the control room, so we are not doing that anymore, then the type of uranium shape really doesn't matter.

We are assuming that people are going to be -- you know, the dust is going to be generated during the entire -- all of the hours. That's the compromise we just achieved. So that really falls out of the picture.

MR. RAMSPOTT: But doesn't it affect how much time the radiographer actually spends in the shooting area?

DR. ANIGSTEIN: But we have already -- we have just agreed that we will assume, to be on the conservative side, that

if they are given -- let's say, if the Mallinckrodt purchase order says 400 hours, that means that 400 hours was spent handling the uranium and generating dust.

But this is only a question of the dust inhalation. The radiographer dose is determined, you know, by the film badges, we are just assuming, and that going back the same procedures were followed in radiography. So this -- it doesn't matter. We are not calculating the radiographer dose based on which uranium shape was being radiographed.

MR. RAMSPOTT: You're assuming -- I guess what I'm trying to do is --

DR. ANIGSTEIN: Excuse me. I had -- because the vast majority of the radiographer's time is not spent on uranium; it's spent on steel.

MR. RAMSPOTT: Yes. But the conversation that everybody is having today is about uranium.

DR. ANIGSTEIN: Yes. Uranium dust.

MR. RAMSPOTT: And the uranium --

DR. ANIGSTEIN: Not about uranium -- not about the external exposures to the betatron beam during uranium radiography. That's not what we're talking about today.

MR. RAMSPOTT: If you're in with the dust four times as much --

DR. ANIGSTEIN: But when you are already giving the credit of maximum --

MR. RAMSPOTT: Are you giving --

DR. ANIGSTEIN: -- it can't be more than 100 percent.

MR. RAMSPOTT: -- because I thought I heard 15 minutes.

DR. ANIGSTEIN: No, no. We just got rid of -- perhaps you weren't following, and, you know, it's not a criticism because it's --

MR. RAMSPOTT: I appreciate it

being pointed out, because it --

CHAIRMAN ZIEMER: Let me interrupt here. We are going to see from NIOSH in writing what the revised proposal will be in terms of handling that, what we are calling T1 factor and the time beyond just the setup. So there is going to be a revision to that model that will hopefully take care of that.

And I think probably what will be helpful -- and I believe Dr. McKeel mentioned this, it will help people sort things out, is to maybe chart it out so people can see exactly what the different pieces are for this -- well, for what we're calling the radium era, the cobalt era, and the residual era, and then those different pieces of the doses for radiographers and the different pieces of that.

We have, you know, the direct radiation, the inhalation, the skin doses, and so on. I think an overall sort of summary

chart showing all of those will be helpful to everybody. So that if we're talking about one piece or another, everybody is on the same page, so we are not arguing external exposure versus internal and that kind of thing. So --

MR. RAMSPOTT: Well, that's very helpful. I didn't hear that agreed to, so is it agreed to now I guess, that that is going to happen?

CHAIRMAN ZIEMER: NIOSH has agreed that they are going to modify that model.

MR. RAMSPOTT: The real numbers.

CHAIRMAN ZIEMER: Well, it will be the time numbers, and Jim Neton explained what his thoughts were on that. SC&A thought it made sense, but we want to see it in writing and make sure we all understand exactly what the implications of that are. And that will also determine what the assigned doses would be for the inhalation model. So we need all of that information to put this thing to bed.

MR. RAMSPOTT: Well, actually seeing this chart, then, that's very helpful. I didn't understand that to be the conclusion yet, that --

CHAIRMAN ZIEMER: Well, the chart -- this wasn't the conclusion, but I think I heard Dr. McKeel request that, and it seemed to me that it would make sense for all of us to sort of have that in a concise place, so we could all see what all of the pieces were, kind of in conglomerate.

And, Jim and Dave, I think as we come to closure on this, that would be helpful, to sort of chart that all out, if you can envision what I'm talking about here.

MR. RAMSPOTT: Oh, that would be very helpful because right now, the way I was looking at it, it was all very mathematical formula with no conclusion on it. So that's very helpful. I appreciate that.

May I make one more comment? And

I'll be brief.

CHAIRMAN ZIEMER: Sure.

MR. RAMSPOTT: The other item with the settling, that really concerns me. And I've had some workers reconfirm this. And looking back at my photographs of the plant, when I actually visited and actually received some great photographs from Department of Energy on the cleanup, inside that betatron building there were two external fan sources that blew inside the building. They did not exhaust anything out.

There was no HEPA filters or hanging gas furnaces that during the winter and summer -- during the summer they ran them for ventilation only, no discharge outside or anywhere else, but simply to move air in the building. And I guess I'm concerned about how that would change all of the settling.

And I actually saw one of these hanging furnaces. It's at a car dealership

that I do business with. They blow air like a jet engine. These things -- nothing has changed. In the summer, these guys have those fans going, and that's stirring up all of that dust. I guess I'm trying to figure out how dust settles when it's being blown all the time.

And I confirmed with the workers that is exactly what they did at GSI, essentially seven days a week, 24 hours, and by people that we all know – [identifying information redacted], all guys that the Work Group knows.

Are those fans a consideration?

CHAIRMAN ZIEMER: I don't know the answer to that. I don't know if NIOSH has any comment on that. Can you answer that?

MR. ALLEN: Yes. This is Dave Allen. I know the kind of fans he is talking about. I've seen them at Fernald. I have seen it in my dad's service station, actually,

and in a number of other places.

It's a fairly standard industrial type of event to have some sort of ventilation, whether it's circulated outside or just recirculated inside.

MR. RAMSPOTT: This is circulating inside only.

MR. ALLEN: Right. And that's not unusual. I know, from what I've seen at Fernald, a lot of them at Fernald had hot water line -- or steam actually, from the boiler plant, and you'd turn that on in the winter and it heats the building. And you turn the steam off in the summery and you get the fan to at least blow air around.

MR. RAMSPOTT: How is that being taken care of with this settling?

MR. ALLEN: Well, for most of the surrogate data, places we had, I mean, they are -- and not to mention all over, there is -- a lot of that stuff is in the northern

climates and you're going to have some kind of heat in the wintertime in these production buildings.

And normally you are going to have some sort of ventilation. It's pretty standard to have some kind of ventilation in the building.

MR. RAMSPOTT: How do you ever get settling when wind is blowing? That's my question.

MR. ALLEN: Well, if it actually is churning it up --

MR. RAMSPOTT: Yes.

MR. ALLEN: -- it tends to -- you do get ventilation with the outside air, too, usually through fugitive emissions if nothing else. And the more it's churned up in the air, the more you tend to get --

MR. RAMSPOTT: Not with a 10-foot wall you wouldn't, a 10-foot thick wall. That place is like a tomb. I've been in it.

MR. ALLEN: Yes. I realize it looks like a tomb, or whatever. But you'd still get enough ventilation for people to have oxygen. I mean, you do actually get a decent amount of ventilation.

MR. RAMSPOTT: It's not going out, Dave, it's -- if anything, it's coming in.

MR. ALLEN: It's got vents in the roof, and it's got --

MR. RAMSPOTT: They didn't run the vents in the room during the winter. That was confirmed. They actually covered them.

MR. ALLEN: You still have some circulation or people would be suffocating, John.

MR. RAMSPOTT: I'm just --

CHAIRMAN ZIEMER: Well, I think John's question was, is there any settling if you have that --

MR. RAMSPOTT: Yes. That's the question.

CHAIRMAN ZIEMER: And actually you still have some settling. It's still based on particle weight, but the air concentration might be higher. I believe, Dave, what you're saying is in most of those industrial ones from which we get the data, including the settling data, they all have some kind of ventilation or fans or circulation that is along the same line.

Everybody has got air moving in these plants. You still get some settling and you still get some resuspension, just from the air movements. But that's -- I'm just saying that in a general sense. I think you'd have to look at specific data to confirm that.

MR. RAMSPOTT: Paul, that's what I was going to say, too, because this really is like a tomb. Doors were closed. It's not like a big general plant, you know.

CHAIRMAN ZIEMER: Got you. Got you.

MR. RAMSPOTT: So it's just -- I wanted to raise that. I thought it was a valid point, and the workers brought it up and are concerned about it.

CHAIRMAN ZIEMER: Got you.

MR. RAMSPOTT: I guess, more importantly, will it be looked at or addressed? Are there any thoughts from SC&A on it?

DR. MAURO: This is John. The only thing I would like to point out is that, since we are dealing with surrogate data, and, you know, there is some material already regarding how that data was selected, however, there is the four or five criteria that surrogate data is always put to, one of which of course is, is there anything about the design of the ventilation systems and the -- you know, that's one of the criteria.

So I guess I would offer that in supporting the surrogate data that this is

certainly part of a process, and it needs to be part of the record, that, yes, we put the surrogate data to the test of the four or five criteria -- I forget how many there are -- but I do remember one of them is -- you know, is now -- is it comparable with respect to things like building design and ventilation.

So I would be helpful, you know, it sounds like that -- and correct me if I'm wrong -- you are close to the process of almost putting a preview out of what the Appendix BB revision will look like. I don't know if that's your next step or is it -- you know, or some type of material that would allow us to take a look at, okay, everything is now converged, it sounds like we've resolved all of our differences, and now this is what the matrix is going to look like.

And it would almost be a preview to Appendix BB, and it would be helpful if part and parcel of this includes, you know,

surrogate data. Part of it -- it probably would be helpful to go through the surrogate data criteria and demonstrate that it meets those criteria.

DR. ANIGSTEIN: This is Bob. There was one issue that has not been talked about and that has not been resolved, and that is: there is a major difference in the modeling of the dose to the layout man during the new betatron period, meaning from late '63 on to the end. We are off by a factor of two. We have different assumptions, and we do not agree with the NIOSH approach.

And then there is also skin dose, which we -- is based on the technical issue based on which MCNP model you use -- which MCNP version was used, and that, again, we have some significant differences. So those are two things that have not been talked about recently, but they were talked about in the past.

So these are not new issues, but they have -- you know, they have just -- we went on to other issues since then. So just -- I am not saying we should -- probably not profitable to discuss it now, but that needs to -- you know, before a new Appendix BB comes out and we are asked to review it, it would be helpful to resolve this, so we don't have to keep going back to the drawing board, or sending NIOSH back to the drawing board.

CHAIRMAN ZIEMER: Thanks. Any other comments or discussion on those?

DR. McKEEL: Dr. Ziemer?

CHAIRMAN ZIEMER: Yes.

DR. McKEEL: This is Dan.

CHAIRMAN ZIEMER: Yes, Dan.

DR. McKEEL: Just one very quick comment is, you know, I think the idea -- actually, John Mauro asked Dave Allen, "Are you close to putting out a preview Appendix BB?" And Dave Allen didn't get a chance to

answer, the way I heard the discussion.

But a key point that I want to make about today's agenda is that the one thing that is glaringly missing from the agenda, and I put it in the one-page summary that I referred to as goals that I would like to see this Work Group accomplish soon, was to finish resolving all of the issues, all of the SC&A findings, in the Appendix BB issues matrix.

And I think the last one was November 26th of 2012. And I wrote you and Dr. Ziemer wrote me and said that definitely was still a matter to be discussed. And here we are talking about perhaps getting ready to have a preview of Appendix BB.

Well, you know, Stuart Hinnefeld has written me several times, and the latest being yesterday, that Appendix BB was not going to be revised until all of those outstanding issues in the issues matrix are

resolved. And I'm going to really expect that that be the case.

So I really am not clear is -- when are we going to get around to addressing Appendix BB, Rev 1, and the findings from -- of SC&A and have them all resolved? There certainly are open issues, as anybody can read in that 11/26/12 version of the issues matrix.

CHAIRMAN ZIEMER: Well, the simple answer is that the resolution of the issues matrix is very dependent upon what we are doing now, and that is, how do we model the various components of the exposures? But that's really what the issues matrix is all about. So --

DR. McKEEL: I'm just saying that it's a little premature to talk about a preview of Appendix BB until we've gotten through all of these models and --

CHAIRMAN ZIEMER: Right.

DR. McKEEL: -- the Appendix BB

issues have been resolved.

CHAIRMAN ZIEMER: I think my phone had probably cut out when somebody mentioned the preview of BB, because I just had to sign in again, but I hadn't heard that myself. I think what -- I guess what is being asked for -- who asked for the preview?

DR. McKEEL: John Mauro just simply suggested that --

CHAIRMAN ZIEMER: Oh.

DR. McKEEL: He was --

DR. MAURO: This is John. I was just asking, because I think that there has been some conversation that it's time to put some matrices together of what, you know, this is starting to look like. And which sounded to me like a preview of Appendix BB, and that's of course -- and we took off from there, whether or not that is a good way to think about what the next product is, or is it premature.

CHAIRMAN ZIEMER: Well, in a sense, the preview would be the summary of all of the components that are going to be revised as I think, for example, with the length of the work week, which was long ago settled and that would be in the appendix.

Also, you could have all of these issues we are talking about, how you handle the internal uranium uptakes in various eras and for the various workers, what the beta doses are going to be and all of those different components.

So, in essence, I think coming to closure on each of these individual pieces will lead us to coming to closure on the various parts, the various issues that were raised in the original findings.

Some of them, in a sense, have already been taken care of, but we haven't formally closed them. I mean, we have come to closure on how things are going to be

approached, but we haven't actually closed the matrix. But we need to get all of these pieces in place, is how I view it.

And I did think that the suggestion that Dr. McKeel had of having a chart so we could see the individual pieces, would be very helpful.

Now, I am looking here at my own clock. I think we do need to have a lunch break for people who are here, and it doesn't necessarily have to be a long one. I wanted to come back, and I have some questions myself on the issues raised by Dr. McKeel on the Adley report, and I would just like to get a little feedback perhaps both from NIOSH and from SC&A, if they have any feedback, on some of the questions there. And then I'd like to move on to Baker Brothers and Joslyn and Simonds, which I think we can handle fairly readily.

So I assume most folks are home or

-- well, the NIOSH people, you may be at the office. But would a 30-minute break be sufficient for people to grab lunch?

DR. NETON: That's fine by me.

DR. McKEEL: Dr. Ziemer, may I make -- this is Dan McKeel. Can I make one more comment?

CHAIRMAN ZIEMER: Oh, yes.

DR. McKEEL: There was a -- there is an agenda item, which I would say D, public comments and submissions, under three --

CHAIRMAN ZIEMER: Yes.

DR. McKEEL: -- and I do have a few more comments on the other papers and --

(Telephone ringing.)

DR. McKEEL: My comment was, I have about a half-page more of comments.

CHAIRMAN ZIEMER: Oh, that will be fine. You can --

DR. McKEEL: Can I make that after lunch, please?

CHAIRMAN ZIEMER: Yes, sure.

DR. McKEEL: Because I -- yes.

CHAIRMAN ZIEMER: Yes, we can do that, Dan.

DR. McKEEL: Okay.

CHAIRMAN ZIEMER: Not a problem. Not a problem.

DR. McKEEL: Thank you very much. Yes.

CHAIRMAN ZIEMER: So we'll take a 30-minute break and then resume.

(Whereupon, at 12:55 p.m., the above-entitled matter went off the record and resumed at 1:28 p.m.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

(1:28 p.m.)

CHAIRMAN ZIEMER: Okay.

MR. RAMSPOTT: This is John Ramspott. I'm on the line.

CHAIRMAN ZIEMER: Okay. Thanks, John.

Dan, you're on the line, right?

DR. McKEEL: Yes, sir. I am.

CHAIRMAN ZIEMER: Okay. There were some items -- Dr. McKeel did a review of the Adley report and raised some issues, and also had some other comments. I don't know that we necessarily need to go through your full report page by page, but I had some questions I wanted to ask. And I don't know if we will be able to answer them.

But one of the -- I think one of the main issues was the fact that there was the reports of high uranium dust loadings from rod handling, and also from a couple of other

operations that seemed to be at variance with what we saw from the rod handling and other handling data that was being used as surrogates.

And I wanted to get some clarification, if I could, if somebody has the answer to it, on comparing this facility, which is Hanford Works facility, with others. It wasn't clear to me whether the dust loadings resulting from handling the rods were associated with the fact that the overall facility may have been at a higher sort of ambient contamination level to start with so that the handling of anything stirred up existing uranium.

Does anybody have an idea on how to understand this information in the Adley report? Either NIOSH, SC&A?

MR. ALLEN: Yes, Dr. Ziemer, this is Dave Allen. I think I can shed some light on this maybe, if I understand the question

right.

CHAIRMAN ZIEMER: Well, it appeared to me that -- it appeared that some of this information is at variance with what we had seen in the other surrogate data that we're using.

MR. ALLEN: Okay. To start with, I mean, we went through the surrogate data quite a bit, and I think I gave a couple of different presentations to the full Board. And all through that I kept discussing criteria on, you know, what would be considered good surrogate data for what we were looking for there. And one of the issues was the possibility of interference from nearby higher airborne-causing operations, which I think you alluded to a second ago.

In the Adley report, on Table 10, which is page 43 of the report, it's the third page of a three-page table, one of the jobs being mentioned there is rod receiving, and

it's got car unloaders and the airborne concentration is 142 times 10 to the minus fifth micrograms per cc, or about 1,420 micrograms per cubic meter.

I think that might be one of them you're talking about. That particular job has an asterisk next to it with a note at the bottom of that table that says, "This procedure has recently been changed. Rods are unloaded with a hydrocrane by bundles and are weighed within the melt plant building." And the melt plant building is essentially the bulk of the building where, you know, lots of different evolutions occurred.

There is a map or a drawing of the building early on in the report, which I can point to here in a minute. On page 42 of the report, it mentions rod handlers. And, again, I think this might be -- if I'm not mistaken, this is what you're talking about with higher airborne levels, and the rod handlers, the

jobs that they looked at, were straightening and loading table and storage bay stacking, sweeping, and then other duties.

Loading the table was the highest with 140, and that's the units in the report times 10 to the minus fifth micrograms per cc. The other jobs, the straightening was 35, the storage bay stacking was 81, and the sweeping was 39.

If you go near the beginning of the report, there is a map of the building. And I'm trying to get to the page here. Page 6 of the report, and you can see in the middle of the main bay of the building the rod straightener.

It's near the south side of the building, relatively centered in the building, a little more towards the south side, next to the oxidizing furnace. It's got a feed table and an off-take. The rods were loaded into a straightener, straightened, and then offloaded

in the straightener.

I think it's -- between what those say, what the footnote says, and what this map points to, I think you can say there's -- there's no way you can say there was not interference from other operations. Very likely there was, certainly from the straightener, not to mention the oxidizing furnace.

So with all of that in mind, I don't think that is something we could have used for surrogate data to say that it's representative of handling cold uranium metal. There is just too much possibility of other operations in the area that are causing interference.

CHAIRMAN ZIEMER: Okay. I sort of wondered if that wasn't the case, or at least that's your understanding of it. SC&A, do you have any comments on this issue?

DR. ANIGSTEIN: Yes, this is Bob.

We pointed out that that data was actually in a report that we prepared on August 31st of last year, and we excerpted the section with scenarios and we listed three operations: unloading rods from truck with forklift, receiving rods, unloading truck and stacking rods, sample readings of man operating forklift, and then loading straightened rods directly from table onto truck.

And the dpm -- it's in -- the data is listed in terms of micrograms, but to be consistent with our units in this report I converted it to dpm per cubic meter. And we had an extremely -- unloading rods from truck with forklift, extremely high, 3900 dpm per cubic meter.

We have to remember that the MAC, maximum allowable air concentration -- correct me if I'm wrong, John -- was 70 dpm per cubic meter. So we are going based on old health protection standards -- well, current at the

time. So here we are going some, you know, a multiple of that, about -- what would it be -- 10, 40, something like 50 times, a 50-time multiple of that. So that would really be clear.

So I think in the end we agreed when we came up -- this was the first SC&A's first objection to the surrogate data previously used by NIOSH. However, at the end when there was a survey of all of the sites, SC&A and NIOSH and the Work Group concurred on this value that gave us something like 68-point-something, 95th percentile.

And for the reasons that Dave just stated, we agreed that this was unlikely. It was like an outlier and very different from other operations and unlikely that this was simply from the handling, rather than from the furnaces that were right nearby I think in the same building.

CHAIRMAN ZIEMER: Okay. I just

wanted to get some input on that. But let's go ahead and let -- Dr. McKeel had some points to make, and perhaps other ones as well, on the Adley report.

So, Dr. McKeel, why don't you go ahead and raise your issues on that, and then your other comments as well.

DR. McKEEL: Okay. Thank you very much, Dr. Ziemer. Well, I'm glad we talked about the forklifts and the handling. I guess the preface I've got to make is that my reading of what was important related to GSI in the Adley '52 report was really quite different than what either NIOSH or SC&A have been saying, except that, for example, the forklift number that was decided a year ago -- well, this last year by SC&A -- I don't see how you can just dismiss that.

The Adley report says quite clearly that they thought that there was cross-contamination from other areas of the

plant, including areas where production was quiescent. And so, you know, the cross-contamination was important.

On the other hand, you know, we have just heard a rationale for why the gas furnaces blowing continuously shouldn't make a difference in the re-suspended uranium in the betatron building, and the rationale given was because every site had some of those furnaces.

Well, no, every site wasn't like GSI, and that certainly was not compared in the surrogate data criteria analysis by NIOSH. It just -- it wasn't in there. So I think that's a legitimate point that differentiates GSI. Now, you know -- so that's one point.

The second point is the rod handling, you know, was -- there were many different kinds of rod handling, but certainly the uranium metal forms received from Mallinckrodt at GSI underwent different kinds of handling. They were taken from the freight

cars and the truck beds. They were hooked up to chains. They were moved with forklifts. People have talked about that.

The other thing that Adley points out, very interesting little bit of data, was that there is extra dust kicked up by the forklift exhaust, and, you know, that is a powerful exhaust that further stirs things up. So that's another reason.

They use a lot of forklifts at GSI. And, remember, we do have testimony that the chainmen had to lift the uranium ingots, for example, to get them onto the railroad transfer cars. But there were other operations in getting them from the terminal railroad cars into the loading dock and so forth, where they were handled with forklifts. So they weren't handled full-time only by chains and cranes. So that's one point about that.

But, again, the Adley activities

that I think recapitulate what happened at GSI, that do qualify Cook for cold uranium handling, are some of those handling operations, the sweeping operations, and, as I mentioned this morning, cleaning uranium from the transport truck beds.

At Hanford they said they used filing, scraping, and grinding. [Identifying information redacted], who observed that activity taking place on the railcars and the rail transfer cars at GSI, said that those cars that transported the uranium, Mallinckrodt uranium, into both betatron facilities, that they were cleaned very infrequently, maybe twice a year.

And they were taken outside to do that, they were scraped with the bucket of a backhoe turned upside down, so it could be used as a scraper. And that was done outside and they took the debris, including the uranium-containing dust, and dumped that

outside.

Mr. Dutko, when he was alive, had told us that other cleaning of those railcars was done with an air hose, which, again, you know, would stir up the dust and certainly exposed those operators to high levels of airborne uranium.

So I completely agree that the Hanford melt plant in many ways was not exactly similar to GSI. But on the other hand, the surrogate data that everybody has chosen to use from Mallinckrodt and Fernald, they weren't like GSI either. You know, they were uranium feed materials plants, Department of Energy facilities, great, big, handling thousands of tons of uranium.

So they weren't strictly similar in many ways to GSI, and yet the passed muster the second time around as excellent surrogate data sources.

We are calling to everybody that

SC&A, the first time around, found that four of the five surrogate data criteria designed by the Board were not met by the surrogate data that Dave Allen picked, and then there was some culling and rearranging and so forth, while yet leaving in the big DOE sites. And this time around, the second time, now, I thought, rather amazingly, all five Board criteria for surrogate data were met.

So, and then I also mentioned, you know, that in the report by Dr. Thurber, which he went over in detail today on TBD-6000 Rev 1, that both he and Dr. Anigstein and Dr. Mauro have enthused about Adley 1952 data as being really excellent data.

And, in one sense, it really is excellent data, in the sense that they numbered the samples, they actually performed the measurements, they often confirmed their measurements two different ways. Nothing like that was done at most of those surrogate

sites. You know, we don't have any data like that from Weldon Spring. We don't have any data like that from Fernald. We certainly don't have it from the AWE sites, and we surely don't have it from General Steel Industries.

So, you know, I'm just claiming that my view is that the rod handling, the sweeping, the freight car unloading, the cleaning of the transport vehicles, all that does have parallels to what happened at GSI.

And I strongly believe that the uranium airborne dust levels measured in Adley '52 at the Hanford facility are way higher in some instances. I reproduced the relevant graphs to GSI, I thought, in my paper. And I strongly urge everybody to read it. We don't have facilities this morning to go through it, or the time, but I will ask you to do that. So I think that's the main thing that I have to say about that one.

And then the final comment I want to make for the day is, I apologize in advance, but I wanted to put on the record my views of why ORAU OTIB-0070 is not an appropriate model to use at GSI. And I've said this before, but I really haven't spelled it out. In that paper that I sent this morning, I did try to spell it out, and there are really two main points that I'd like to make about that.

That is that what OTIB-70-01 actually uses are two computer codes, RESRAD-BUILD and DNB. RESRAD-BUILD, you know, is the more -- does the more complex modeling of the two, but you can see from the graphs that basically it's, you know, a resuspension and resolution curve, or a settling curve, that's modeled in that. And I don't think that those models can simulate the complex conditions that existed for airborne uranium at GSI during the residual period.

The residual period was 26 years long. We have put on the record ample evidence that the two betatron facilities were power washed repeatedly. The new betatron facility was renovated for offices. And in Buildings 8, 9, 10, and 5 and 6, multiple companies moved in, leased the space, used it for other steel-making operations, and all of those operations involved disturbing the uranium along the transport path through those other buildings, as well as in the betatron facilities which were repurposed and reused for other purposes.

So, anyway, the basic models that are in OTIB-70 I don't think are appropriate to GSI.

Now, yesterday, in his reply to me, DCAS Director Hinnefeld wrote and said he thought, in general, he realized that those models couldn't exactly reproduce this cyclical uranium dispersion in the air, but he

said. on the average, over a long period of time. NIOSH felt that this was a good approximation of what happened at GSI.

So I would just say that that's two markedly different opinions. I would say this; I would say the model that I am talking about of uneven, intermittent, varying amounts of resuspension settling rates, and so forth, more faithfully recapitulates what happened throughout the Hanford melt plant, where the magnitude of the bars representing uranium air intake are often high, often above the acceptable limits for the time, but they vary greatly between different kinds of operations, whether the metal was heated and so forth, but they're high for a lot of operations where the metal was basically cold. So that's my point about that.

The second point about OTIB-70 that nobody has mentioned is that the Procedures Review Subcommittee, chaired by

Wanda Munn, examined OTIB-70 as part of their procedures review at least three times in Subcommittee meetings in 2010 and in 2012.

And at the March 12, 2013, Augusta Board Meeting, Wanda Munn presented the PRS findings on OTIB-70. And the paper that I did on that includes some of the slides that she presented that caused me a lot of concern. But the main one in just picking that out was that those slides were arranged so that there was a finding from Rev 00, and that was compared to what was done in Rev 1 of OTIB-70.

And so you can sort of compare what was the initial situation and then what was done as the remedy. And what struck me was the slide that showed the resuspension factor.

And as we've heard this morning, everybody seems to be quite comfortable -- by "everybody," I'm talking about the Board, SC&A, and NIOSH -- with a resuspension factor

of 10 to the minus fifth to use at GSI.

Well, the slides that I'm talking about that Wanda showed were that the resuspension factor at many other sites could be as high as 10 to the minus three, or 10 to the minus four. And I found other references to resuspension factors that were as high as 10 to the minus two.

So, you know, I think that everybody seems to be sanguine that 10 to the minus five is a nice number, a comfortable number, but I don't think it's a realistic number. I think that the resuspension factors were higher at GSI for the reasons that I have just mentioned and more like the ones you would see at the Hanford melt plant.

So what I think is unfortunate is that in the SC&A papers, and in the NIOSH papers, there is not the recognition that I think there should be that the literature supports higher resuspension fractions and

functions than do the final reports and the number that everybody has finally settled upon.

I think, for practicing good science, I think the range of resuspension factor values that's in the literature should be presented first, and then a selection for 10 to the minus five should be stringently supported. And I think except everybody saying basically, gee, we like that, or we think that's good, or something like that, I don't think that's sufficient support for that idea.

So, anyway, that's the main thing I wanted to bring up about that, and I think the other thing that I would just like to remind everybody about one more time is that it has been seven months since the Board voted on SEC-105, and we still don't have good, solid numbers that are going to be assigned for internal and external doses for the

various classes of workers.

And I'd also remind everybody that it is June 20th, and that's six full years since Appendix BB Rev 0 was released. And I was extremely happy to hear about the summary chart of values, but I must say it is going to be at least two more months before we get around to considering the Appendix BB matrix.

And I just urge everybody -- I know that there are budget constraints, but, if necessary, we ought to have two meetings a month until we resolve those Appendix BB issues, like happened in March of 2012 when there were two Work Group meetings two weeks apart to resolve issues.

And, anyway, I thank you very much, Dr. Ziemer, for letting me comment. That's really all I have to say for today.

Thank you.

CHAIRMAN ZIEMER: Okay. Thanks, Dan, for your input on these issues. And let

me ask if any of the Work Group Members or any of the staff have any questions to ask Dan at this point on his comments. Josie or John?

MEMBER MUNN: Paul, this is Wanda. I wanted to let you know I --

CHAIRMAN ZIEMER: Oh, Wanda. You're on. Welcome.

MEMBER MUNN: -- that I had joined the call and heard most of Dr. McKeel's comments. But, no, I don't have any questions for him.

CHAIRMAN ZIEMER: Well, thank you for joining us, Wanda.

MEMBER MUNN: Yes, I'm sorry about that.

CHAIRMAN ZIEMER: Yes. John or Josie?

MEMBER BEACH: Paul, this is Josie. I think he covered it well in his papers, and I don't have any questions of him.

CHAIRMAN ZIEMER: Okay.

MEMBER POSTON: No questions, Paul.

CHAIRMAN ZIEMER: Okay. What I want to do here to sort of wind up the GSI discussion today is quickly review the immediate deliverables and then what the Work Group report to the Board will be. I have NIOSH is going to provide some input on TBD-6001 Rev 0 on that bullet point dealing with the equilibrium time rationale. Is that correct, NIOSH?

MR. ALLEN: Yes, that's correct, Dr. Ziemer.

CHAIRMAN ZIEMER: Right. And, secondly, on the square function, NIOSH is going to detail how they will revise the handling time of the T1 issue, and then SC&A would review that. Is that correct?

MR. ALLEN: Yes. I have that down as basically just updating the intake estimate.

CHAIRMAN ZIEMER: Right. And then, we didn't go into detail, but I think I want to ask NIOSH to develop a chart -- I'm calling it a chart -- on the components of the dose reconstructions for all of the eras, so we can see what the specific sort of numbers are going to look like, for example, for the radiographers in the radium era, for external dose, and for all of the other components. And, likewise, the same kind of a cross-chart of all of the pieces. Can you develop that for us for our next meeting?

MR. ALLEN: Yes. And my thought was the simpler the better. It was going to be --

CHAIRMAN ZIEMER: Yes.

MR. ALLEN: -- a table with a lot of footnotes or something.

CHAIRMAN ZIEMER: Yes. A table, yes. That's what I'm thinking about.

MR. ALLEN: Yes. Nothing like

what John Mauro mentioned about a preview of a --

CHAIRMAN ZIEMER: No, no. No, I think we're talking about a table, so we can -- and, again, Dr. Anigstein reminded us that there is a couple of pieces where we don't have agreement yet, and we need to make sure we identify those, where we have to resolve things yet.

MR. ALLEN: Yes.

CHAIRMAN ZIEMER: Okay. And I think at the upcoming Board meeting I will just report where we are on these issues, and what we are planning to do to come to closure on getting the revision of BB in place.

Ted, do you have some additional thoughts on that?

MR. KATZ: No, Paul. I'm glad you raised this, though, because I wanted to ask before we wrapped up about this issue. I've probably put aside more time than you need,

because I was uncertain -- I was thinking it was possible we would be actually reporting out, and we won't be. So I think you probably only need about 15 minutes for this. Is that not --

CHAIRMAN ZIEMER: That should be fine.

MR. KATZ: Yes. Okay. Very good.

MEMBER BEACH: Paul, this is Josie. And I just wanted to touch base a little bit on the surrogate data. And I know John had mentioned looking at the surrogate data based on the criteria the Board has set forth. I don't know if this is the appropriate time to look at that or to have SC&A look at that, because that hasn't been done yet for --

DR. ANIGSTEIN: This is Bob Anigstein. I was under the impression that we had a meeting -- we had a meeting I believe November 28th, and I was under the impression

that there was unanimous acceptance of the surrogate data for dust load, uranium dust loading during uranium handling.

CHAIRMAN ZIEMER: Yes, there was. I think maybe, Josie, are you raising the question about the air flows and the --

MEMBER BEACH: Yes, the Adley report.

CHAIRMAN ZIEMER: Oh, the Adley report.

MEMBER BEACH: And, yes, the ones we're using.

DR. NETON: This is Jim. We've already been through that, though. I mean --

MEMBER BEACH: Okay.

DR. NETON: -- I don't know whether we want to revisit that all again. I mean, you know, we close these issues, and then we bring them up again for the same reasons.

DR. MAURO: Yes. Let me -- this

is John. First of all, the reason I mentioned that is -- and certainly correct me if my recollection is off -- but the search we were on when we went through this process to find surrogate data was to try to find facilities that appeared to be doing things, or aspects of activities at different facilities like Adley, that, yes, that looks like it has analogy in terms of the kind of things they were doing by way of handling uranium that are a lot like what our understanding is of how things were being handled at GSI.

But I do not recall that -- on many occasions when surrogate data has been used in the past -- oh, I could think of a number of places, where we actually put together -- or SC&A did -- as part of our review, whenever surrogate data was used, we usually had an appendix which identified each of the five criteria, what they are -- I think there are five -- actually restating them, and

then a little paragraph describing the degree to which and why we believe that the surrogate data that has been chosen does in fact meet that criteria.

DR. ANIGSTEIN: John, we did that. We did that last fall. We did it last fall. We reviewed the -- well, first, we had the critiques going back to August. Then, sometime before November, or before the November 28th meeting, NIOSH followed our recommendation which was to look at a large number of AWE sites, or just sites where uranium was being handled.

They did that. They came up with a number of sites. We reviewed that. We critiqued some of the data, and we ended up with a consensus set of data, which was -- the two sides were not far apart to begin with, and then we ended up with a consensus that was an agreement. And so SC&A signed off on that and the Board signed off on that.

DR. MAURO: Okay. So we do have someplace on the record --

DR. ANIGSTEIN: Yes, we do.

DR. MAURO: -- Criteria 1, Criteria 2, Criteria 3.

CHAIRMAN ZIEMER: Yes. Actually, we did that initially on the --

DR. ANIGSTEIN: We did it several times.

DR. MAURO: Okay.

CHAIRMAN ZIEMER: Yes. We did it first on the original data that was being used, and that's what led us to move to looking at other data, because the first set you said did not meet the criteria.

DR. MAURO: Yes. I remember that. And, my apologies, I did not remember that we also did it when the final set of data was selected.

MEMBER BEACH: Okay. And for my part -- this is Josie again -- I just wanted

to make sure that all of the surrogate data we're using has been identified and has been looked at against the criteria. So if that has been done, then that's great.

DR. ANIGSTEIN: Yes. SC&A, myself, we not only examined the NIOSH reports -- that's done as a matter of course -- but we went back and looked at all of the source documents that NIOSH has used.

Not every -- I mean, they looked at something like, I don't know how many sites, but all of the source documents that they cited are -- all the sites that they cited, we looked at the source documents, even other source documents that they did not cite for the same sites, and we came up with our conclusions, which were not all that different from NIOSH's.

MEMBER BEACH: Okay. And then, Paul, one more thing.

CHAIRMAN ZIEMER: Yes.

MEMBER BEACH: Dan McKeel brought up a lot of different information in his paper that came out on the 19th about -- he asked for someone to take a look at and come to some kind of conclusion or give him some feedback on that, and that wasn't mentioned either as something that would be tasked.

CHAIRMAN ZIEMER: Which one are you referring to?

MEMBER BEACH: The one that came out on the 19th. Well, wait a minute. Maybe it was the June 6th. There has been so many. I've got piles of them here.

CHAIRMAN ZIEMER: June 6th, I think, is the Adley review.

MEMBER BEACH: Right.

CHAIRMAN ZIEMER: All right. And June 19th was some comments on the Board minutes or the transcript. Are you talking about the transcript item?

MEMBER BEACH: No. I believe it's

the June 6th one that he brings up a lot of different points.

CHAIRMAN ZIEMER: Okay. That's the Adley review, right?

MEMBER BEACH: Correct. Yes.

DR. McKEEL: Dr. Ziemer, that was my point. The SC&A review that Bob Anigstein is referring to was strictly confined to those surrogate data sites that Dave Allen had first identified and then SC&A had come up with an alternate data set. But Adley was not part of that review.

So I don't -- here's the way I put it. I do not think that -- now, you can say that Adley is not involved with GSI as surrogate data, but it is, because Dave Allen -- and that was the point of that transcript excerpt recitation that I made in the 6/19 paper. Dave Allen clearly says that NIOSH is going to use OTIB-0070 Rev 1, Sharfi 2012, to calculate the uranium intake values for GSI.

So, you know, and that is going to be highly dependent on the data in Adley. So I think that Adley should be justified -- actually, I think the -- the overall --

THE COURT REPORTER: This is the Court Reporter. There is a terrible echo effect. Just started.

CHAIRMAN ZIEMER: I was getting a lot of noise also. Go ahead, Dan. I think the noise is gone again.

DR. McKEEL: I'm sorry. Yes. I was just saying that I think, I wish, that the use of Adley in conjunction with OTIB-0070 as surrogate data for GSI, that residual period in particular, should be used. And then I think, as was said now in many ways, the Adley data is also applicable to GSI operations for handling cold uranium actually all through the operational period as well.

So I think that's two areas that just have not been looked at adequately by

SC&A or by anybody. So that's what I would say needs to be looked at. I don't think all of the surrogate data at GSI has been subjected to the Board criteria.

CHAIRMAN ZIEMER: So I guess that question is -- is Adley -- does TBD's OTIB-0070 use Adley as a way in which you -- that somebody, the Board, needs to justify Adley as a surrogate? That's one way of looking at this. Or the other way is, is -- if one were to include the Adley values for, let's say, rod handling, you would have to go through a justification that Adley is somehow like GSI and use it as a surrogate.

And you're saying in one case we are using it as surrogate, in OTIB-0070, and in another case we're not using it as a surrogate.

DR. McKEEL: That's right. So I think that ought to be clarified. Is it okay to use it or not? And I was trying to draw

the distinction that I understand that there was total agreement, except with me, that using surrogate data from Weldon Spring and surrogate data from Fernald was okay because those sites are similar to GSI. I mean, I think on the face of it that was an incorrect conclusion to draw. I don't think they are at all comparable.

But what I'm saying is, as far as Adley, I think both of the things that Dr. Ziemer just said are true. It is -- Adley '52 is an integral part of OTIB-0070 Rev 1, and it is being used as surrogate data at GSI for the residual period in particular.

But also, the SC&A analysis of surrogate data selected by NIOSH didn't include Adley '52, and I think NIOSH should have included Adley, and I think that should have been looked at, because it gives you a completely different picture of the airborne uranium levels, depending on which of those

surrogate data sites you used. Anyway --

CHAIRMAN ZIEMER: Well, yes. I mean, I'll just comment -- and we won't prolong this -- but I think in the latter case NIOSH eventually tried to eliminate sites where it appeared that there would be interference on the handling by other nearby processes. So there was a rationale for saying we are not going to include it. In other words, not every site that is handled would necessarily be included.

But the other part of it is, what about the OTIB-0070 thing, which is not our document as far as GSI or TBD-6000 is concerned, but we are using it in terms of the Board's --

DR. McKEEL: You are using it to bound the doses at GSI for --

CHAIRMAN ZIEMER: Yes. Yes. Yes. I understand what you're saying, and a related question is whether or not it has been

appropriately vented in terms of its own review.

DR. MAURO: This is John. I think I see what the dilemma is with OTIB-0070. The aspect of OTIB-0070 that has applicability here is that deposition velocity. In other words, Adley is where we -- the source work was done by David Allen to show that that .00075 meters per second is a good way to predictively model the rate at which material falls, dust falls and builds up. It is not in itself -- as best I recall, that's the only aspect of OTIB-0070 that uses Adley information.

And, of course, in that regard, that deposition velocity was of course used as part of predicting what the exposures might be during the residual period at GSI, but I do not believe there is anything by way of airborne measurement data that has -- at Adley that has any relevance to OTIB-0070, just the

velocity, how they derive that velocity.

So I think that that might be a little bit a source of confusion. I hope this helps.

DR. McKEEL: I still think it has to be looked at, even if that is the --

DR. MAURO: It has been looked at. In other words, OTIB-0070 and the deposition -- in fact, the deposition velocity that was talked about at length by -- which is also part of TBD-6000, that deposition process has been thoroughly reviewed as to whether or not that's a good number to predict the rate at which uranium settles out.

DR. McKEEL: I understand that, but I'm still saying -- Adley 1952 and the Hanford melt plant, we know where the site was. Has that been vetted with the five Board surrogate data criteria at GSI? In other words, have those sites stringently been justified to be shown to be comparable?

MR. ALLEN: This is Dave Allen. I think if you were to vet the Adley -- either the Hanford melt plant against GSI and the surrogate data criteria you would find that the air sample data at the melt plant would not be a comparable process. It would fail the surrogate data. That's why it was not --

DR. McKEEL: You must not have listened to me, because I -- I mean, I -- the operations were similar, but the stringent justification of the two facilities being the same and having the same kind of operations, it clearly would fail on that basis, but I'm also saying that when you all -- I'm talking about SC&A and NIOSH -- looked at surrogate data, and the Work Group looked at surrogate data at GSI for the Dave Allen surrogate data sites, you know, it was finally blessed that big sites like Weldon Spring and Fernald were in fact similar to GSI.

And the paper I wrote about that

shows a very nice comparison. Even the AWE sites were not like GSI. Most of them are small, had very few claims. They didn't have betatrons. They didn't have the same source mix.

And so, you know, I just think it's an example of selectively using something that is convenient to use deposition velocity, and that, you know, you all have said many times surrogate data ought to be investigated, ought to be verified as passing the five surrogate data criteria of the Board. Thus, why were they constructed in the first place?

And I'm just saying that a key critical element in OTIB-0070 depends on Adley '52 and Adley '52 and the Hanford melt plant. Use of surrogate data at GSI has not been subjected to those five surrogate data criteria.

I agree with Dr. Mauro, of course, that the velocity -- the deposition velocity,

once again, everybody thinks that's a good number. I'm sure that's why it was plugged into OTIB-0070, but that still doesn't get you around the surrogate data criteria issue.

DR. NETON: Dr. McKeel, but by that argument we would have to just look at every single set of monitoring data we have in our possession, and selectively then just pick Adley and test that -- we should test everything.

DR. McKEEL: Yes. You should just --

DR. NETON: That's not practical. You'd have to --

DR. McKEEL: That's exactly what --

DR. NETON: -- you think meets the criteria and then test them, which we did. We found multiple representations and we vetted them. You can't possibly look at the universe of all possibilities and selectively deny

them. It's just not practical.

DR. McKEEL: I think you are being very selective in what you do look at.

DR. ANIGSTEIN: This is Bob. I would like to break in. First of all, I would like to correct Dr. McKeel. Adley is not even mentioned in OTIB-0070. It's not in the list of references. It's not mentioned anywhere in the document. It is mentioned in TBD-6000 where the deposition velocity is used, as well as the deposition velocity based on other reports and scientific studies, which is mentioned in OTIB-0070.

And the fact that some information, such as in TBD-6000, is used in Adley, all that's simply saying is here are places where uranium dust was generated, and there were collection plates set out to see how fast it falls.

That does not mean that the concentrations were similar. It just means

the uranium dust is -- was similar because it was generated from aerosol and it generally behaved in a very similar manner. So just because one parameter is applicable doesn't mean that everything in Adley is applicable here.

And we did look -- SC&A did -- we first brought up the Adley data. I was doing the review of surrogate data with my colleague, Bill Thurber -- I don't know if he is still on the line -- pointed that out, those three criteria. I mean, those three measurements of the loading of the rods.

And we looked at that. We brought it up. I mentioned that earlier today. And then NIOSH said, no, this is not consistent with so many other places, and we agreed that uranium handling, plain ordinary uranium handling is unlikely to have produced that high a concentration, and there had to be contributions from the melting -- uranium

melting furnaces nearby.

And so this has been very, very thoroughly vetted. You can always find a reason why it should -- why it is not -- you know, there can always be something where it's higher, but we believe -- and as everybody very well knows, we do not always agree with NIOSH. Perhaps more often than not we do not. But here we did find consistency that this was a well-researched, well-evaluated set of data.

It doesn't meet -- and, again, it doesn't mean that Fernald or Weldon Spring is like GSI. It simply meant that the individual handler, you know, whether you have a 100-acre site or a one-acre site doesn't change the nature of the uranium handling on a local basis, which is measured at the worker's breathing zone. So it's just -- these objections are simply not relevant to the validity of these data.

DR. McKEEL: Well, I take offense at that comment. I think they are highly relevant, and all I'd say is I'll stand on what I wrote in my papers. I think that analysis you just gave is -- you know, I just -- I don't think it's worth taking up any more time. I just disagree with you.

CHAIRMAN ZIEMER: Okay. Well, we have dealt with these issues a lot before as well, so the views are on the record and we know where we are on that.

DR. McKEEL: Right.

CHAIRMAN ZIEMER: I don't see any deliverables on this at the moment. I think we may agree to disagree on how to interpret these at this point.

Josie, did you have further comments or questions on that? I'm not hearing her.

MEMBER BEACH: No, Paul. This is Josie. I just wanted to make sure that it was

clear and that we had covered it. So I'm good.

CHAIRMAN ZIEMER: Okay. Okay. Yes. Ted?

MR. KATZ: Just a quick clarification. I mean, given that we are really just giving a Work Group update on GSI at this next meeting, versus the -- do you want just to do that during the normal Work Group updates? Or do you want separate additional time in effect?

CHAIRMAN ZIEMER: I can do it during the normal updates, whichever works out best for the schedule, Ted.

MR. KATZ: Okay. That's fine. I think that will probably work nicely.

CHAIRMAN ZIEMER: Okay. Very good.

MR. KATZ: Okay. Thank you.

CHAIRMAN ZIEMER: We'll move on now to Baker Brothers. And I'll just remind

you that at our last Work Group meeting on April 26th, the Work Group voted to recommend that an SEC not be approved for the residual period. So, and as we agreed -- there was agreement by NIOSH and SC&A on including the issue of the generation of fires, that the doses could be bounded.

So I think that's -- I think that's where we're at on that, in terms of Baker. Tom, or Bill Thurber, do either of you have any comments on Baker Brothers?

MR. TOMES: This is Tom. What you just summarized is where I understand we're at on that.

CHAIRMAN ZIEMER: So I think on Baker we simply recommend to the Board that they approve the NIOSH position that doses can be bounded for the residual period.

MR. KATZ: Right. Paul, this is Ted.

CHAIRMAN ZIEMER: And that the SEC

Class not be granted. Yes, Ted?

MR. KATZ: This is Ted. And the reason I just put this on the agenda is I just wanted to make sure we address whether you want -- I don't know whether you want help with either -- from SC&A drafting up, or NIOSH drafting up a presentation, so that you can cover what was considered and resolved in getting --

CHAIRMAN ZIEMER: Well, I think maybe what we'll do, I can do a very brief presentation of what the recommendation is. And I guess if the Board wants to have any additional information on the issue of the fires maybe Tom could summarize that very briefly.

MR. KATZ: Okay. That's fine.

CHAIRMAN ZIEMER: Or at least be prepared to.

MR. TOMES: At which meeting?

CHAIRMAN ZIEMER: Or should we

just go ahead and plan to do that?

MR. KATZ: Well, that's what I'm -- I mean, I can certainly circulate the paper. I think, Tom, there has been a memo addressing this. I can certainly circulate that, but I think the Board generally would like to have -- to hear what the substance was that was addressed and put to bed before to support the recommendation.

So either from Tom or SC&A either way, whichever can do it most readily, it would be good I think to just have the substance presented and addressed.

CHAIRMAN ZIEMER: Yes. Maybe Bill Thurber cold be available, then, also to sort of confirm SC&A's position on that.

DR. MAURO: I'm not sure if Bill is on the line. Bill, are you there?

CHAIRMAN ZIEMER: Wasn't Bill Thurber the one involved with this one?

DR. MAURO: Yes, he is. I wasn't

sure whether he was --

MR. THURBER: I'm back on the line, John.

DR. MAURO: Yes. We did -- Bill certainly could go ahead and summarize it or be prepared to answer any questions. We agree that the doses could be reconstructed. The original issues that we raised had to do with fires.

CHAIRMAN ZIEMER: Yes. And that's why I say we could have a brief --

DR. MAURO: And that has been resolved.

CHAIRMAN ZIEMER: Right.

DR. MAURO: The only thing left now, and that is in one of our reports that we sent out, is I guess there is one -- I'm sorry, what I would call a Site Profile issue, and that has to do with whether in fact there was cleanup at the end of the operation or not.

NIOSH has made its arguments that, yes, there was some cleanup by drawing analogy to other sites that were I guess run or owned -- I'm not sure exactly the relationship -- under contract, that did the same kinds of things where there was cleanup after the fires and after the operations.

And the assumption is that would probably happen here also, and we agree there's a good chance that there was this cleanup. And that affects what assumption you would use during the residual period regarding the resuspension factor.

CHAIRMAN ZIEMER: Right. But that's not -- that's not a site --

DR. MAURO: That is not an SEC issue at all. It is only, I think, a readily resolvable Site Profile issue.

CHAIRMAN ZIEMER: Right. Right.

MR. KATZ: This is Ted. So, again, I'm just asking either -- if Bill will

do it, that's fine. I mean, you don't -- certainly no one needs to travel to make a presentation, but it would be good to have -- whether it's two or three slides, but that tells the rest of the Board substantively what issues were considered and then put to bed to allow the Work Group to reach its conclusions.

MR. THURBER: I can do that. This is Bill. I can do that if you want me to, or NIOSH can do it and I can look it over. Whatever you folks want.

MR. KATZ: Yes. So, Bill, that's fine. I don't hear NIOSH volunteering to do it, so that would be great if you would do it.

CHAIRMAN ZIEMER: Yes. I think Bill can do it, since it represents the Board's contractor and --

MR. KATZ: Right.

CHAIRMAN ZIEMER: -- they can give their evaluation. I'll just kick it off, and I'll just give you a heads up that I won't be

at the meeting in person myself, so --

MR. THURBER: What is the date we are going to need this by?

CHAIRMAN ZIEMER: Well, the meeting, Ted, is July --

MR. KATZ: Yes. This is on the agenda for July 17, Bill.

MR. THURBER: Okay. All right.

MR. KATZ: And just a few slides, and we will need those slides the week before, so that they can be distributed --

MR. THURBER: Yes.

MR. KATZ: -- and posted, and so on.

MR. THURBER: I got you.

MR. KATZ: But it can be very brief.

MR. THURBER: I got you.

MR. KATZ: Thank you.

MR. THURBER: We'll take care of it.

CHAIRMAN ZIEMER: Okay. On Joslyn, let's go ahead to Joslyn. I think there we just need a status report from DCAS on Joslyn.

DR. NETON: Is Sam on the line?

DR. GLOVER: Yes, I am.

DR. NETON: Okay. Good.

DR. GLOVER: So we have been preparing responses, Paul, for all of those different parts, and we have bundled them to, you know, things that seem to be together. We try to make those, you know, like there were -- we agreed there were some handoff errors as people didn't convert between some units in some of the tables, and we have also realized that some of the figures were impacted by that. And so we are preparing to, obviously, make sure that those are all correct as a kickoff to our discussions.

We have been conducting a number of interviews and inviting SC&A and the Board

to attend as --

DR. NETON: Sam, this is Jim. We might want to just start by mentioning what we are trying to do here, and that is, is the 1948 date a good start -- end date for the SEC, right?

DR. GLOVER: Right. That is true, Jim. Obviously, through 1948 -- through '47 we have an SEC. In 1948, we concluded that we can do dose reconstruction through 1952. There is no residual period at Joslyn. And so we are basically responding to the concerns.

There was 11 findings listed in SC&A's report, and I think Bill Thurber was one of the authors of that.

MR. THURBER: Guilty.

DR. GLOVER: And so we are just making sure, you know, some of those were factual mistakes that were made, so those are fairly straightforward. Others, you know, we certainly are in the process of making sure

that we appropriately look through all of those.

And so the things that are straightforward we are fixing quickly, and others we are researching and including the Board regarding, one, energy use associated with the fires. And I think I may need Bill and SC&A to address whether their concerns -- if they answered their own question on our fires with their TBD-6000 report, if they want another response, because they sort of I think agreed that perhaps they are covered by TBD-6000, the outside burning.

MR. THURBER: That is indeed what we concluded. Obviously, we did that work after we had reviewed and critiqued the Joslyn report. Obviously, if NIOSH has some additional information, and certainly the interview that you conducted with the guy that actually did the burning I think is extremely valuable information that needs to be

documented in support of the position that the fires are not that troublesome.

DR. GLOVER: And these were -- as mentioned earlier, they were an external -- they would collect these things in buckets and take them outside, and they would be picked up and -- if there was enough wind. And so we can -- we certainly will document that, Bill, and we will use your all's discussion, in addition to what we've found, to put that all in an official response so the Board can look at all of that at one shot.

MR. THURBER: Good.

DR. GLOVER: That's finding number eight was mostly this issue of fires. Finding three we still are certainly working on what Jim described as this 1948 start date. Why does HASL -- why do we believe that TBD-6000, based on basically the HASL approaches, HASL measurements, why is all of a sudden -- why do we stop the SEC and believe that Joslyn is

covered?

And so we are making sure that we have covered all of our bases. One of the interviews brought up that -- what I consider perhaps slightly unusual but we are verifying that is that the rolling mills at Joslyn were water-cooled bearings.

And so there are some experience, and I believe in the summary report, I think it's Kingsley, the one that TBD-6000 is based on, they describe that being a major factor in affecting the air concentration data. And certainly they did it one time at Bethlehem Steel, and they said, don't ever do it again. It created a massive amount of steam and oxides and things. It certainly enhances the exposure rate.

We do have measurements of the 1952 -- that were conducted in '52 of that rolling mill, and so those were bounded by TBD-6000. So it may be that we are just -- we

want to make sure that we properly vet that, if there is anything that might affect our use of TBD-6000.

So we are conducting interviews, and we will of course continue to keep the Advisory Board and SC&A apprised of those, and putting together our -- I believe we were thinking -- Monica, are we hoping to be done towards the end of July with our responses? I think is what we have -- she may not be willing to talk. She may not be on right now. But I think we are wanting to have some materials to you guys by the end of July, Paul.

CHAIRMAN ZIEMER: Okay. That sounds good.

DR. GLOVER: Okay.

CHAIRMAN ZIEMER: Any questions, Board Members?

(No response.)

Okay. If not, let's move on to

Simonds Saw and Steel. We have a number of items in the findings matrix that were in abeyance awaiting actual action. But let's get updates from DCAS on that. I think, Tom, you have some words for us here?

MR. TOMES: Yes, I do. On the 12th of this month, I sent an email out to the Working Group, an additional response to two findings that were discussed at the last Work Group meeting. One of those is Finding 1 concerning the external doses that were modeled in TBD, and we had some discussions regarding those doses compared to some limited film badge results.

And basically my -- the message that was sent out was that our model doses are favorable in relation to the extrapolated film badges, and that also provides us a means to estimate uncertainty. And I believe as far as in principle that -- SC&A has not responded to this particular spot, but I believe in

principle at that last meeting they were somewhat in agreement with that approach.

MR. BARTON: Yes. Tom, this is Bob Barton with SC&A. I did see your response. And, yes, you're correct. I think we are in agreement in principle. At the last meeting we kind of had discussed these extrapolated film badges, and it was a very fruitful discussion, and eventually we all came out that, well, even though we have these film badge results, the method that has been adopted is actually more claimant-favorable and, like you said, it gives a method to actually estimate the uncertainty on the external dose.

So, yes, I think we're on the same page with regard to that one.

CHAIRMAN ZIEMER: So you are both in agreement on -- that's on Finding 1?

MR. TOMES: I believe so, yes.

MR. BARTON: Yes. That one had

been in progress I believe because we didn't have any sort of formal response at the last meeting about this whole issue. But I think, you know, this one should be in abeyance because, you know, we are in agreement, and then there will be some language put into the Site Profile revision that kind of discusses this whole -- the whole issue and why the model that has been adopted is in fact claimant-favorable. So --

CHAIRMAN ZIEMER: Okay. Well, I think the latest matrix that we have shows that it is in abeyance.

DR. NETON: That's correct.

CHAIRMAN ZIEMER: And so I guess we can just leave it there, then, which means we have agreed to the change, and it just has to occur.

DR. NETON: Yes. In fact, I think the first three findings, actually four --

CHAIRMAN ZIEMER: Yes. Actually,

Finding 2 is in abeyance, so is three.

DR. NETON: Four and five.

CHAIRMAN ZIEMER: Four and five are all in abeyance, and then number six we have a response to today.

DR. NETON: Yes. And six -- Tom will probably talk about this, but we are still working on these. Tom, do you want to provide some update on that?

MR. TOMES: Yes. The topic we got into detail somewhat last time was -- that needed more work was the TBD for that contract period at Simonds Saw and Steel assumes a 2,500-hour work-year. And then, the residual period drops at 2,000, and the TBD would provide a rationale or a reason for that change broadly.

And so SC&A commented on that, and we agreed to look at it, and we agreed that we should hold ours steady at 2,500 per year throughout the residual period, which would

affect the doses in the TBD revision.

CHAIRMAN ZIEMER: Okay. But you are still reevaluating this, then, is that right?

MR. TOMES: Other parts of this finding -- it's under evaluation concerning the residual period. What is holding up getting some of these resolved is we are looking at -- we got into some discussion last time on the 1954 general area data site including the TBD.

So that's what we are -- one of the things we are looking at right now is to come up with the appropriate value to use for an air concentration at the start of the residual period.

DR. NETON: Yes. There's a couple of different -- there's sort of a unique situation at Simonds where you -- you know, we agree that we should use the monitoring data that is close enough -- as close to the end of

the operational period as possible, which would be '54, and that's fine.

But then you have a residual period that has a couple components. One, it goes through, what, '82, Tom, or something like that, and then the plant basically shut down and nothing was going on. And the question is, how do you really model that properly? And we are still in the process of trying to strategize on that.

CHAIRMAN ZIEMER: Okay. There is no action that we need to take today that --

DR. NETON: No.

CHAIRMAN ZIEMER: -- so this will remain in progress, and hopefully by our next meeting you will have --

DR. NETON: Yes. It shouldn't take too long. It's just a matter of coming to grips with the issue.

CHAIRMAN ZIEMER: Okay. Any questions on any of these on -- that's the

last one on Simonds, isn't it? Let's see.

DR. NETON: Yes.

CHAIRMAN ZIEMER: Finding 7 is still in progress, too, right?

DR. NETON: Yes, that is tied into the same issue in the residual period.

CHAIRMAN ZIEMER: Right. Right. Okay. Any questions, anyone, on Simonds?

MEMBER MUNN: None here.

CHAIRMAN ZIEMER: No action is required.

MEMBER MUNN: No.

CHAIRMAN ZIEMER: Okay. I think that completes our agenda today. Ted, are there any other housekeeping issues that need to come before us?

MR. KATZ: No, I think we are all set, unless you want to just get a sense of when the Work Group could meet again, meaning when the action items that are on the table could be discussed. And I don't want to press

anyone. I know it's -- we can't do that on the fly. But if anyone has a general sense now, it would be good to have that sort of --

CHAIRMAN ZIEMER: Well, I think probably the only things that are pending are the GSI things, really, that we need to push ahead on.

MR. KATZ: Right.

CHAIRMAN ZIEMER: And I'm wondering if -- how people's schedules are. I think we are certainly going to be into the -- toward the end of August as far as I'm concerned. What does --

MR. KATZ: Right. Well, Jim or Dave, just -- are we thinking about that it would be sometime middle-to-late August, or do we need to wait?

DR. NETON: I don't like to speak for Dave much, but it seems like that's a reasonable time frame to get what we've got to get done. Dave?

MR. ALLEN: Yes. Ted, are you talking about to get the three papers I owe to the Work Group? Because SC&A needs some time to look, I would think.

MR. KATZ: Yes. No, no. And I would -- certainly, I think the sense of how long it would take you to get them and then we would need to add time for the -- so that SC&A isn't under a crunch to be able to respond.

MR. ALLEN: I mean, I can guarantee them by the end of August, and I can shoot for much earlier than that. But there's no guarantee, because something else pops up every day, you know?

MR. KATZ: Okay. Well, then, I mean, let's -- maybe let's not schedule right now. And, Dave, I just would like to point out, once you have some feeling of surety about the time frame when you would be delivering these, please just let me know. And then, at that point, I will schedule with

the Work Group for another meeting.

MR. ALLEN: Okay.

MR. KATZ: Okay?

CHAIRMAN ZIEMER: Yes, that will be fine.

MR. KATZ: Right.

CHAIRMAN ZIEMER: We kind of have to play it by ear, then, until we see where -- because I know you have other things going, plus some limitations on things at the moment, too.

Okay. Any other items that need to come before us today?

MR. KATZ: No. I think that takes care of the meeting.

CHAIRMAN ZIEMER: Okay. Thank you, everyone. Appreciate your time. We'll be talking to you at the Board meeting.

(Whereupon, the above-entitled matter went off the record at 2:42 p.m.)

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