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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 SEC ISSUES

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WEDNESDAY
MAY 27, 2015

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The Work Group convened via telephone at 10:00 a.m. Eastern Time, JAMES M. MELIUS, Chairman, presiding.

PRESENT:

JAMES M. MELIUS, Chairman
JOSIE BEACH, Member
GENEVIEVE S. ROESSLER, Member
PAUL L. ZIEMER, Member

ALSO PRESENT:

TED KATZ, Designated Federal Official
BOB BARTON, SC&A
MILTON GORDEN, SC&A
JENNY LIN, HHS
JOHN MAURO, SC&A
DAN MCKEEL
JIM NETON, DCAS
JOHN RAMSPOTT
JOHN STIVER, SC&A

A-G-E-N-D-A

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

10:00 a.m.

MR. KATZ: Welcome, everyone. This is the Advisory Board on Radiation Worker Health SEC Issues Work Group.

The Work Group is dealing with two matters, or mostly one, Dow Madison Appendix C of TBD-6000 review by SC&A.

And then we're just going to catch up on status of matters with respect to coworker models at the end of this meeting.

Since we're talking about a work site let's get conflict of interest from agency staff. Let me respond to Board Members. None of the Board Members have any conflicts with Dow so we can dispatch with that.

And for the record, we have our Chair and all our Work Group Members online, present.

So, let's go -- oh, and I should mention on the website is the agenda for the meeting today. So it's on the NIOSH website under the EEOICPA part

of the website, Board section, meetings, today's date.

And both the agenda and the SC&A review of the Dow Madison TBD are posted there on the website.

So, let's go on to attendance for staff members starting with the NIOSH ORAU team.

(Roll call)

MR. KATZ: Okay, then. We have attendance and I think we've covered everything.

Please mute your phones, everyone, except for whoever might be addressing the group. And press *6 if you don't have a mute button to mute your phone. Press *6 again to take your phone off of mute.

And Jim, it's your meeting.

CHAIRMAN MELIUS: Okay, thanks Ted. And Jim Neton, it looks like we have you outnumbered today. But we know you'll do well.

DR. NETON: I hope so.

CHAIRMAN MELIUS: And my understanding

from my correspondence with you is that there's no written response from NIOSH or ORAU to the SC&A review, but you are prepared to address the issues raised by SC&A.

It's really up to you and SC&A how you want to -- what's the easiest way to do this.

Jim, if you want to go through, I think there's a total of two findings and five observations in the SC&A review. If you want to lead through them that might be the easiest way and most efficient way of doing it.

DR. NETON: Yes, I think that makes sense. I think there's only -- yes, there are five observations. You're right.

It might make some sense if SC&A would just sort of put their position for each one on the table and I can respond in kind.

CHAIRMAN MELIUS: That would be fine also. So I don't know who's speaking for SC&A?

DR. MAURO: This is John Mauro. I worked very closely with Milton on this review so

I guess I'll kick it off.

CHAIRMAN MELIUS: Okay.

DR. MAURO: And Milton, please help me out. I know that you did a lot of the heavy lifting also.

And Bill Thurber was involved also in a consultative capacity. Unfortunately I guess he's not joining us today, but we'll move forward.

The first finding has to do with the classic resuspension factor issue. And it's an interesting issue. Let me explain.

During operations, 1957 through 1960 where was the uranium machining going on, the way in which the internal doses were derived was the classic TBD-6000 approach which are based on the Adley data which gives you information on dust loadings for different types of machining operations.

And it's empirical data. In other words, it's what they measured.

So in one strange respect we said, geez,

I wonder why they put in resuspension factors. You do that when you're modeling it. But when you actually have real data, in this case the Adley data, the TBD-6000 data, that in effect reflects anything that's in the air, whether it's from direct airborne from machining or from resuspension.

So, our first reaction was you really don't need to do that, that is add in the resuspension portion because it's effectively already there from the empirical data.

But then on closer inspection maybe it was okay to do that, and stay with me for a minute on this.

During the operations period, '57 through '60, you really could break it up into two time periods.

There was the 1957-58 where they were doing one type of operation. And then '59 and '60 where they were doing another type of operation. So two different types of operations, so two

different sets of empirical data from TBD-6000 were used to reflect the two different types of machining operations.

When you get to the second one you ask yourself the question, okay, you're in the second half. That might have been the extrusion part, I forget. It was a different operation than in '59 and '60.

You say, okay. I go into TBD-6000. I pull out the airborne dust loading, and I get a concentration, and I do my inhalation dose calculations.

Then you say well, wait a minute, hold it. In '57 and '58, preceding that time period, there was already residual radioactivity on the ground from those first two years of operations.

So, in a way that would add, in other words it would add to the contribution to airborne dust loading that occurs a little bit later in '59 and '60.

So, in sort of a circuitous way we went

through a process saying I wonder why they put that in.

And then it dawned on us well, maybe that was a good idea, and certainly it's claimant-favorable.

That being the case -- I'm sorry for the long story, but I want you to understand conceptually.

That being the case our first finding is well, if you're going to do that, wouldn't you want to use a resuspension factor of ten to the minus five? Because it's sort of like an active environment. So that was our first finding. Wouldn't it have been better to use ten to the minus five and not ten to the minus six per meter. So that's finding number one.

And I guess it's good at this point to sort of hand it over to Jim and see what his thoughts are.

DR. NETON: Okay, thanks John. I think the situation here is actually a little

simpler than you think.

The nature of this operation was that it only occurred for 21 days out of 250 work days.

So, the resuspension that we're using is actually resuspension for the additional work days that were there after the 21 days out of 250.

DR. MAURO: Ah okay, okay.

DR. NETON: So you don't have a continuous operation here. You've got the 21 days' worth of project work and then regular work going on. And clearly there could have been some resuspension from the 21 days of operation.

DR. MAURO: So there are these windows at each campaign so to speak.

DR. NETON: Exactly.

DR. MAURO: I've got you. Okay, good, thank you. Got that clarified.

DR. NETON: And we treated those separately.

And in fact, what we did was we assumed that the deposition occurred on the first day

instantaneously of each two-year period. So it's fairly claimant-favorable in that respect. We didn't bother to integrate it over time.

And on top of that I think the thinking behind using ten to the minus six versus ten to the minus five.

And actually, there's a -- this is in TIB-70. TIB-70 is talking about the residual period. This is actually during the operational period.

DR. MAURO: Yes.

DR. NETON: But the ten to the minus six has been the default. And then we would need to justify why that wouldn't be appropriate.

And in this situation, as I said, there was 21 days' worth of work. What they did, and if you look there's a contract out there on the Site Research Database, number 10273 which is the contract between Mallinckrodt and Dow.

This work was done on behalf of Mallinckrodt under contract. It was written in

1957.

And they defined in that contract a 28-hour work cycle. And the work cycle was such that at each work cycle there would be 6 hours of setup time, 16 hours of extrusion, and then 6 hours of cleanup time.

So, after every single operation there was 6 hours of cleanup. So we felt that after they cleaned up the operations sure there could have been some residual much as it probably fixed, and the resuspension factor of course only applies to loose contamination. Therefore, I think the ten to the minus six is appropriate here.

DR. MAURO: Jim, I have to agree with you given that you have this record of cleanup after each campaign.

DR. NETON: So then after that the place is essentially -- I wouldn't say it's clean clean, but it's definitely been cleaned to the point where they removed all the loose material.

DR. MAURO: It's not an unreasonable

assumption.

DR. NETON: And in fact, I think as you pointed out, even so, the resuspension is a fairly minor, minor component of the intakes that are being assigned from the extrusion operation which in -- well, the extrusion operation in 1957 and '58 I think the air concentration was 553 dpm per cubic meter, but it has a GSD of 5 on it like we do with all these TBD-6000.

So the upper end of that distribution is almost 8,000 dpm per cubic meter versus some trivial amount of resuspension.

DR. MAURO: Yes, it varied the resuspension contribution. I understand.

DR. NETON: Right. Okay.

DR. MAURO: This is John. And from my perspective Jim has thoroughly answered the question to my satisfaction.

CHAIRMAN MELIUS: Any Board Members have questions on that issue?

MEMBER ZIEMER: This is Ziemer. I

think that's very helpful. Jim's explanation clarified that to me. That was very helpful.

CHAIRMAN MELIUS: Great. Josie or Gen, anything to add?

MEMBER ROESSLER: No, that explains it for me.

MEMBER BEACH: For me too. I don't have any questions.

CHAIRMAN MELIUS: Okay, thank you.

DR. MCKEEL: Dr. Melius, this is Dan McKeel.

CHAIRMAN MELIUS: I'm sorry, it's not public comment period. We'll give you time at the end. So I'd ask you not to interrupt, please.

DR. MCKEEL: Thank you.

CHAIRMAN MELIUS: Okay, Jim, I don't know what -- how you want to do this, in what order, but Jim Neton, do you want to go on?

DR. NETON: Yes. I think SC&A maybe could discuss the nature of finding 2 and then I'm prepared to discuss that as well.

CHAIRMAN MELIUS: Okay.

DR. MAURO: I'm going to pass this one onto Milton. It has to do with some tabulated material.

Milton, are you in a position where you could address this particular issue? Because I don't recall my bringing this particular one up.

MR. GORDEN: Okay. This has to do with a calculation performed in TBD-6000 in Section 7.1.5 of TBD-6000.

There's a calculation in regards to the surface contamination concentration.

In TBD-6000 they calculate using 7,000 dpm per cubic meter. They calculate a surface contamination of -- I'm sorry -- yes, surface contamination of 1.47 times ten to the eight picocuries per square meter.

And in order to duplicate it what I did was I converted the 7,000 dpm per cubic meter multiplying it by the deposition factor of 7.5 times ten to the minus four meters per second. And

then converted from 30 days down to the second.

And in my report on page 13 is kind of where I summarize that. And I come up with a value of 6.1 times ten to the 6 dpm per square meter.

Now, I realize the units are different. I calculated dpm per square meter and in TBD-6000 it's picocuries per square meter.

I just thought it was very interesting that the difference was almost a factor of -- or exactly a factor of 24.

And so I didn't know whether there were some conversion issues going on there.

But, be as it may, if I keep apples to apples and compare picocurie per square meter to picocurie per square meter I still come up with a difference.

I come up with a 1.36 times ten to the seven picocuries per square meter as compared to the 1.47 times ten to the eight picocuries per square meter, which is a factor of between 10 and 11.

And so I didn't know if there was -- I could be miscalculating, but I didn't know if there's an error in TBD-6000 that would then affect Appendix C numbers.

And that's -- I guess are there any questions?

CHAIRMAN MELIUS: Jim Neton?

DR. NETON: Yes, I can comment on that.

SC&A is absolutely correct. There is an error in that calculation in TBD-6000. And in fact, I think 24 hours per day was entered into the calculation twice inadvertently.

But that calculation in Section 7.1.5 of TBD-6000 was an example that assumed that one had 100 MAC or 7,000 dpm per cubic meter air. Sort of indicating if you didn't know anything else, 100 MAC air, use it and that's what you would get.

I'm not even aware that that number has been used in any calculation. But it's certainly not used in Dow Appendix C. So even though the air is -- we acknowledge there is an error in that

number it wasn't used in the Appendix that's been reviewed.

I'm not sure how to handle that. We do need to fix that, but it was not an Appendix C issue.

CHAIRMAN MELIUS: I guess we refer it back to Dr. Ziemer.

MEMBER BEACH: That's what I was going to say too.

MEMBER ZIEMER: Well, if you're not using it in the Appendix. So it's just an error.

This is basically, Jim, that you were using as 100 MAC, was it not?

DR. NETON: That's correct.

MEMBER ZIEMER: So, we have this information in the record here. I guess I would defer to Ted in terms of administratively how you handle that.

MR. KATZ: I think we can just, since we have this finding it's sort of independent of this review in a sense.

But we can get this put in the BRS and

then just follow up to make sure there's closure at the end.

But I guess the folks at NIOSH need to figure out if this calculation isn't used for any site then I'm not sure why it's even -- whether it matters at all, and whether we need to close it.

DR. NETON: Right. I mean, we may have to close it by just removing that example calculation.

MR. KATZ: I think the TBD-6000 Work Group anyway can just -- that is the right place to just drop this.

And at whatever point NIOSH figures out whether they're going to remove it or whatever they can report back and then they can close that finding.

DR. NETON: Well, I think I'm going to pass this over to Lori Marion-Moss on our side. And she's the keeper of that database for us. And see how she wants to enter it in there and notify Wanda that it's been entered.

MR. KATZ: Okay.

DR. NETON: I think that's the best way. That seems to me the easiest way to go.

MR. KATZ: Sure.

DR. NETON: Okay.

CHAIRMAN MELIUS: How do you want to handle the observations, Jim?

DR. NETON: Oh, I'm sorry, I was on mute. I can probably just go over them. Then if SC&A has any questions on my response. Because they tend to be a little easier than the others do.

CHAIRMAN MELIUS: Okay.

DR. NETON: Observation 1 is actually related to finding 1 which says separate resuspension values in the operational period are not necessarily what the air sampling data would account for.

I think we discussed that and the rationale behind why we thought we needed them.

DR. MAURO: This is John and I agree.

DR. NETON: Yes. So I think that one

was simply dealt with.

This observation 2 is a little trickier, but it has to do with the assumptions that were made to assign resuspension during the residual period which begins in 1961.

And the gist of the finding was that the table group seemed to follow the laborer category. It's supposed to be 50 percent of the worker category and it's not.

And the reason for that is because the resuspension factor was actually sort of a combined average of the two periods, 1957 and '8, period 1, and 1959 and '60 as period 2.

And so in 1959 they pulled the data out of Table C.2. I think it's Table C.2. Bear with me here. I have six documents open on my table here.

It wasn't Table C.2. It was Table 7.2 out of TBD-6000.

So, Table 7.2 of TBD-6000 talked about the air sampling data for facilities that extrude

uranium rod which is what occurred in 1957 and '58.

And the general labor category is what we would use for labor. And if you look on Table 7.2 the value assigned there is 147 dpm per cubic meter. That's what we used for the first two years.

In the second two years we used the data from Table 7.7. And the data there indicates -- the general labor daily weighted average was 845 dpm per cubic meter.

So, if you calculate the total value that's resuspended based on most air concentrations you end up with the value that we have for the general laborer in the column.

But it's a hybrid of those two data points, not one table or the other that SC&A seems to be assuming.

I don't know if there's any questions on that. I've done the math, it works out. I think the number is correct.

DR. MAURO: This is John. I think that

explains it to our satisfaction.

DR. NETON: It's a hybrid of the two tables. And you have to pull the laborer data out of each table separately and calculate the total amount that would be on the ground and then inhaled in 1961.

DR. MAURO: Yes, we didn't do that, and that explains it. Thank you.

DR. NETON: All right. And then observation 3 is the header for Table C.5 which does have an error. We acknowledge that and we'll fix it.

The table refers to inhalation and it should be listed as ingestion.

The main table itself, the header is correct. If you look at the table, the C.5 says ingestion intake for uranium. But then if you look on the table itself where it gives dpm per day it refers to inhalation and that's clearly a cut and paste error. That should say ingestion.

And we will certainly fix that. That's

on us to fix.

And then observation 4 has to do with the thoron concentration. And that's really more of an explanatory issue.

The values in the table are actually correct, but what we say in the document, in the Appendix C is that the values were based on those in Addendum 2 to the Evaluation Report.

And in fact, if you look at the Evaluation Report Addendum 2, the 95th percentile value, the geometric mean is correct and the geometric standard deviation is correct, but the calculation of the 95th percentile is incorrect.

And that was identified earlier on by SC&A in the review of the addendum. So we've used the correct value here -- calculated the correct 95th percentile value. So it doesn't match the 95th percentile in Addendum 2, but that value is actually incorrect.

So, I don't think there's anything to fix here other than maybe -- it didn't seem

appropriate to go into a discussion in the Appendix as to why the 95th percentile in Addendum 2 was actually incorrect. I guess that's a judgment call.

And that's an observation anyway. We can add some language if need be to support that. Or maybe just put the calculation in there to show how it was done.

MR. GORDEN: This is Milton from SC&A. Yes, I think it would just -- I was looking at it more as just a referencing issue.

DR. NETON: Right.

MR. GORDEN: I don't know if you need your report so you can reference to the SC&A review report or not. So that I guess would be one option to fix it.

DR. NETON: It might be cleaner I think if we just said that the geometric mean and geometric standard deviation is this which is what's correct in that table.

And then if you calculate the 95th

percentile which is the GSD to the 1.645 power times the geometric mean, show that calculation, you come up with the right number.

That's what doesn't track in the Addendum. They're sort of separate.

But that to me is something that we can fix. It doesn't have to be fixed right away because the number itself is correct. It doesn't change any of the calculations.

DR. MAURO: This is just a housekeeping issue. I don't think how it's resolved, whatever is most expedient.

DR. NETON: I think when we go in to change the header. We're probably not going to reopen the whole document right now, but the next time we change it we'll change that one header and maybe put in that equation to make it clearer how that 95th percentile value was generated.

I don't think we're going to issue a revision just for that reason at this point.

And if that's okay then observation 5

talks about Section 250 to be updated correctly for Table C.7, 8 and 9.

We agree. It's a typographical error so we can correct it in the next revision.

The observations I think were pretty straightforward. So that's all I have to comment on. If there's any discussion I'd be happy to answer any questions.

CHAIRMAN MELIUS: Any Board Members have any comments or questions for Jim?

MEMBER ROESSLER: This is Gen. Am I off of mute?

CHAIRMAN MELIUS: Yes, you are. We can hear you.

MEMBER ROESSLER: Good. I forget whether I'm on or off often.

I would like to -- on finding 2, all the others SC&A said okay, we agree.

And on finding 2 I guess I'd just like to have a verbal statement from John or someone that there was an error. However, it's not important

because it's not used in Appendix C so everything is okay on that one.

DR. MAURO: I'm going to have to defer to Milton because I didn't personally check this number.

And the explanation certainly sounded reasonable. Milton, are you comfortable with that explanation?

MR. GORDEN: Yes, yes, I'm comfortable with that.

MEMBER ROESSLER: Okay, good.

MR. GORDEN: I did have a question on -- going back to Table C.4. I'm just thinking off the top of my head here.

Being the approach that you take in Table C.4 in determining the labor inhalation rate, would that change the approach taken in Table C.5 for the ingestion?

Because in ingestion the labor is 50 percent of the operator. So I don't know if it should really mirror the ratio that's used for the

inhalation too.

DR. NETON: Good question. I haven't looked at that table.

MR. GORDEN: C.5 does explicitly rely, I believe, on I think it's C.1.

DR. NETON: 1961. The ingestion is based on this 20 percent of the observed air concentration.

MR. GORDEN: Right.

DR. NETON: So, no, that number would be correct because ingestion is not based on the daily weighted average of the -- it's 20 percent of the actual air concentration in the plant. Right? The 0.2.

I'd have to go back and look at that. I don't know. I didn't look at that in any detail.

MR. GORDEN: Okay. Well, you're probably right, I just, just off the top of my head when you were giving the explanation for the inhalation in C.4 I didn't know whether you're ingesting -- I guess I have to think about it too

because it's been awhile since I looked at a couple of these tables.

DR. NETON: I didn't look at the ingestion path because it didn't come up.

But certainly, I think C.4 for inhalation is fine.

Ingestion is calculated somewhat differently, but I'd have to go back and refresh my memory as to how those categories are apportioned. So I can't answer that question right now.

DR. MAURO: Jim, this is John. In a related matter when I was rereading this document this morning one of the thoughts that came to me was the ingestion during the residual period.

As you may recall, we ran into the circumstance before where you really can't use the 0.2 approach, the OTIB-009 I believe it is approach for the residual period.

You have to go to what I call the Charlie Yu approach, the hand to mouth approach for

ingestion.

Just a question, really. This is not a finding or a comment or anything.

But when you did the residual period ingestion did you use the 0.2 approach? Because I thought we've already discussed that and that would have been problematic. I don't know if you're following.

DR. NETON: No, the 0.2 approach is okay here, John, because you've got a source generator that's depositing material, you know, we have an airborne concentration that's based on a source generation -- generating a source, source term.

DR. MAURO: Okay.

DR. NETON: Where that falls apart in the 0.2 is if you're getting an airborne based on resuspension.

The resuspension here is based on the airborne that deposited the material in the first place. I think it's okay.

DR. MAURO: Okay. I have to admit I'm having a little trouble making the distinction, but I'll take another look at that.

Like I said, this was something that came to mind while I was reading it. And I thought we may have had the same circumstance.

So you're saying there's a nuanced difference between the other case where we encountered this problem in this case.

DR. NETON: Yes.

DR. MAURO: Okay.

CHAIRMAN MELIUS: Any other questions or comments?

MEMBER ZIEMER: Just a question. This is Ziemer. What is the resolution going to be on this question that was raised, that Gordon raised? Is Jim going to go back and look at something?

DR. NETON: Yes, I think I need to go back and look at Table C.5 and verify that the laborer intake calculation was done properly.

MEMBER ZIEMER: Well, I'm wondering

since this isn't a finding maybe at some point Jim can just let the Work Group know what the finding is, and maybe get a confirmation from Gordon that SC&A is comfortable with that.

CHAIRMAN MELIUS: Yes, I was about to suggest the same thing, Paul. I think that makes sense to do that.

Okay with that? So when you have the opportunity, Jim, if you could do that.

DR. NETON: That shouldn't take too long.

CHAIRMAN MELIUS: Yes, fine. If no one else has comments I believe, Dan McKeel, you wanted to say something?

DR. MCKEEL: Dr. Melius, yes, thank you. I just have a couple of comments.

The one is about finding number 1. And the discussion this morning concerns the fact of the lower ten to the minus six resuspension factor being appropriate because there's a cleanup the various extrusion and rod-straightening

campaigns.

Well, the rod straightening probably leads to very little dust accumulation and resuspension.

But I think there is abundant evidence on the record for Dow Madison that it's a completely different story for the extrusions.

To do the extrusions for both uranium and thorium of course they had to be heated to very high temperatures.

Then it went through the extrusion presses which there were numerous -- nine I think at the plant.

The very key factor here is that, unlike lots of other plants, there were no vacuum hoods installed in the extrusion building at Dow Madison to collect the fumes, the gases, and so forth.

And so if one postulates that all of the dust from the extrusions was cleaned up there is an unchallengeable fact that shows that that's simply not true.

And that is that there was a FUSRAP cleanup of that site, particularly confined, really, to the extrusion building.

And a finding -- that was in the year 2000, now. So decades later they're cleaning up this building and they find mixed -- admixed thorium and uranium residues in the rafters up above the extrusions, way up above the extrusion presses.

And many operators of those extrusion presses gave testimony that there was a tremendous amount of dust and fumes being kicked up during those operations.

So, the idea that some cleanup operation, I think the cleanup operation that they're talking about was picking up the extrusion fragments and scraps off the floor, probably scraping them into a wastebasket or something.

But I don't think there was any cleanup of the dust hosed down and things like that, and there certainly weren't any vacuum hoods.

So, I just think that's an incorrect -- all the assumptions that you all mentioned this morning are belied by the fact that there was significant dust in the rafters that led to the FUSRAP cleanup. That's the whole point of the cleanup.

Now, what's interesting in the cleanup is, of course, they cleaned up the uranium, but they felt like the thorium was all from commercial operations and therefore the FUSRAP team did not touch the contaminating thorium which was still in the rafters in 2006 when Pangea Group came and finally cleaned up some of that other contaminating material.

So, I think for finding 1 I believe that 10 to the minus fifth should be used.

And since extrusion of various metals went on after 1960, you know, there was still a lot of dust going on. And I understand that that would not be uranium, presumably.

The other point I wanted to point out

is my problem with Appendix C Rev 1 and the NIOSH comments about it today, and the SC&A review of it back in April of 2014 is that there were a lot of -- if you look on page 1 of Appendix C Rev 1 in that record of issue revisions you'll see there, and I'm going to read this. It's very short, but it's very important.

And it says that the characteristics of Rev 1 were it was revised to incorporate changes made during the revision to the base document TBD-6000.

And one of those -- there really weren't mentioned this morning exactly what was included.

But the revisions include changes to inhalation values during uranium operations, increased photon dose from contamination based on 30-day deposition, and added beta dose values based on contamination.

Residual period uranium inhalation values increased. The OTIB-70 technique was used during the residual period.

And finally, it says the basis for residual period ingestion values changed to use operational period airborne value and TIB-009 for the first year.

Now, my opinion is that it was SC&A's job to review all of those touted changes that characterized Appendix C Rev 1 and I don't think that was really done.

I don't think it was done in the written review. I don't think it was done today in this discussion.

So, I certainly think the record is really incomplete on this Appendix where the overview if you will says that there are a number of changes made that might increase the dose, and yet we all know that when the PER-058 was issued for this Appendix C Rev 1 it reviewed 80 cases from Dow and none of the PoCs changed to be equal to or greater than 50 percent.

So I think to be fair to those workers whose compensation was at stake, that the SC&A

review should include all those factors.

In other words, they ought to go through those changes that I've mentioned and systematically state yes, we agree with NIOSH that these changes were appropriate and that the calculations are done correctly and so forth.

And to me, what they actually came up with was one finding which I think is based on incorrect assumptions as being closed and okay to stand as is at ten to the minus six instead of ten to the minus fifth.

I think ten to the minus fourth could be considered when you realize that there was so much uranium left in the year 2000 on the rafters above those extrusion presses.

Regardless of how many days it was used that physical amount of uranium was still all over the roof beams of that plant.

So I guess that's where I would leave it, and I thank you very much for letting me chime in.

CHAIRMAN MELIUS: Okay. Thank you, Dan. Any further follow-up on the Appendix C review and the SC&A review?

If not, the second item on our agenda is a quick update here on the guidelines for coworker dose models.

Jim and I emailed to each other a few weeks ago just to update. I don't know, Jim, if you want to just sort of repeat what you said?

You were reviewing comments that came in on the guidelines, and then were thinking about -- remember we had decided that we would -- before finalizing the guidelines sort of take an example coworker model to review using the guidelines. Sort of to fine-tune those.

So, Jim, do you want to give us an update on where that stands?

DR. NETON: Yes. I can do that. I presented the most recent revision of course at the last Board meeting and the Board was asked to comment by April 30 on that revision.

I didn't receive any comments from the Board by April 30. But I did on May 7 receive a fairly detailed commentary from Knut Ringen who is the senior science advisor for the Center for Construction Research and Training.

He provides very thoughtful comments, some editorial, and a number of very specific comments, six pages in total, that I believe I will respond to.

It's going to take some time because of the specific nature of the comments.

I'm going to do that. I'm not sure exactly whether to share this broadly. I don't know, Dr. Melius. I was going to ask your opinion on this.

CHAIRMAN MELIUS: Well, I don't think it's any problem sharing it broadly.

DR. NETON: Yes. Because it did come in. Well, I can share that along with my responses.

I think it will result in some changes

to the document, but nothing I don't think that would substantively change the approach that's been outlined.

Given that, some of the comments provided by Dr. Ringen were more -- asking for more specificity which I really don't, you know, we talked about. Really didn't think it needed to be in there.

And some of them were clarifications of usage of terms which I'm happy to give.

But anyway, given that and nothing substantively changes we are going forward with trying to implement it on a trial basis, or a pilot basis I guess is a better word at two sites, the Idaho National Laboratory and Savannah River Site.

So we are moving forward with that and we've received from the DSHEFS, another division that has done research at Idaho, their entire staff data file which includes a very cleaned up copy of the database for the bioassay and the external dosimetry.

We're going to use that as part of our data quality approach for INL.

And we started to look at Savannah River Site. And in fact, we've already discovered that there's at least one set of building trade workers who probably need to be segregated from the main data set because of their incident-based sampling campaign.

And we're working trying to figure out how to deal with that, whether or not the data collected on them is sufficient for a coworker model or not.

So we're moving forward to that end. It's a major project. It's not going to happen in a couple of weeks, but we are working towards that end.

Hopefully I can share some of the progress we've made at the upcoming Board meeting at the end of July.

CHAIRMAN MELIUS: Good.

DR. NETON: That's all I have.

CHAIRMAN MELIUS: Thank you. Just to let you know, Jim, I concur with your assessment of Dr. Ringen's comments.

I don't think they'll -- there's some things that might help to clarify. I don't think they substantially change the basic guidelines.

And I agree with you on -- getting more specific is very hard given the diversity within the sites that we're looking at and situations. It's very difficult to generalize into specific kind of criteria.

DR. NETON: Right.

CHAIRMAN MELIUS: Any questions on that?

MEMBER ZIEMER: Jim, this is Ziemer. I don't remember seeing Dr. Ringen's comments. Were those distributed?

CHAIRMAN MELIUS: No, they weren't. I'll get a set to Ted to circulate.

MEMBER ZIEMER: Okay, thank you.

CHAIRMAN MELIUS: Yes, they only came

in relatively recently.

DR. NETON: May 7th, I think, or around that timeframe.

I wasn't sure whether to circulate them, but I think it's a good idea. They're public comment on a document.

And I do intend to respond to the comment. I'm not just going to let it sit because he put a lot of thought into it and it deserves a thoughtful response.

MEMBER BEACH: Yes, and I felt -- this is Josie -- at a disadvantage. I mean, I knew the comments had gone in, but not having seen them it's hard to understand what the discussion is.

CHAIRMAN MELIUS: We have time for further discussion, so at a later point. Okay. Any other questions?

MR. BARTON: Yes, this is Bob Barton.

Jim, I think at the last meeting we had sort of a lengthy discussion about how you treat -- in an internal program how you treat those values

that may be less than one-half the MDA.

And I think what we sort of left it at that point was that SC&A and NIOSH sort of had agreed to disagree at that point, but that I think there was maybe one reference that we wanted to point to that maybe might sway or change your mind a little bit.

At this point, I mean where does NIOSH stand on that particular issue?

DR. NETON: Well, we haven't changed our opinion on that issue, but to be honest I have not -- that is an open finding from the review of -- I can't remember the document now -- TIB 73 or whatever the number is.

And that one required response from us. I believe that SC&A, Joyce in particular I think cited an NCRP review that said you shouldn't do that.

And it's on us to respond. And we haven't done that. There's been other competing things going on.

But we do need to take that up and address it.

MR. BARTON: Okay. I just wanted to see if there was any new information. Thank you.

DR. NETON: Nothing new on that front, unfortunately.

CHAIRMAN MELIUS: Okay. If no further comments I believe we can adjourn.

MR. KATZ: Yes, thank you, everybody.

CHAIRMAN MELIUS: Thanks, everybody, and we'll I guess talk to you in, what, a couple of weeks now is our next Board call.

Okay, thank you.

(Whereupon, the above-entitled matter went off the record at 10:51 a.m.)