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

convenes the

WORKGROUP TELECONFERENCE

ADVISORY BOARD ON

RADIATION AND WORKER HEALTH

The verbatim transcript of the Meeting of the Advisory Board on Radiation and Worker Health Workgroup held telephonically, on Jul. 26, 2005.

C O N T E N T S

Jul. 26, 2005

TRANSCRIPT LEGEND

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

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P A R T I C I P A N T S
(In Alphabetical Order)

BOARD MEMBERS
CHAIR
ZIEMER, Paul L., Ph.D.
Professor Emeritus
School of Health Sciences
Purdue University
Lafayette, Indiana

EXECUTIVE SECRETARY
WADE, Lewis, Ph.D.
Senior Science Advisor
National Institute for Occupational Safety and Health
Centers for Disease Control and Prevention
Washington, DC

MEMBERSHIP
GIBSON, Michael H.
President
Paper, Allied-Industrial, Chemical, and Energy Union
Local 5-4200
Miamisburg, Ohio
GRIFFON, Mark A.
President
Creative Pollution Solutions, Inc.
Salem, New Hampshire
MELIUS, James Malcom, M.D., Ph.D.
Director
New York State Laborers' Health and Safety Trust Fund
Albany, New York
MUNN, Wanda I.
Senior Nuclear Engineer (Retired)
Richland, Washington
ROESSLER, Genevieve S., Ph.D.
Professor Emeritus
University of Florida
Elysian, Minnesota

OTHER PARTICIPANTS:

ALLEN, DAVID, NIOSH
ANIGSTEIN, ROBERT
BERRY, MARY
BLOOM, CINDY, MJW
BROCK, DENISE, UNWW
CHANG, CHA CHA, NIOSH
DEVANNY, JOHN
ELLIOTT, LARRY, NIOSH/OCAS
ERLICH, DAVE, GAO
GUIDO, JOSEPH, MJW
HOMOKI-TITUS, LIZ, HHS/OGC
HOWELL, EMILY, HHS/OGC
KENOYER, JUDSON
KOTSCH, JEFF, DOL
MACIEVIC, GREG, NIOSH
MAKHIJANI, ARJUN, SC&A
MAURO, JOHN, SC&A
MCKEEL, DAN
NETON, JIM, NIOSH
NUGENT, MARY, GAO
SAMSON, BOB, GAO
SHEFFITS, SANDRA, GAO
SKALSKI, TED
SUNDIN, DAVE, NIOSH
TAULBEE, TIM, NIOSH
THORNE, MIKE
WESTBROOK, JANET

STAFF/VENDORS

LASHAWN SHIELDS, Committee Management Specialist, NIOSH
STEVEN RAY GREEN, Certified Merit Court Reporter
JONICA MUELLER, Certified Court Reporter

P R O C E E D I N G S

(11:00 a.m.)

(NOTE: Intermittently throughout the progress of the teleconference the telephone connection became less clear and quite fractured, making portions of some comments unintelligible. Those areas are noted as such.)

DR. WADE: I was going to make some introductory comments, Mark, and then really turn it over to you as the Chair of the working group, if that's okay.

MR. GRIFFON: That's fine.

DR. WADE: We're waiting just maybe another 15 or 20 seconds. Is Denise Brock on the call?

MS. BROCK: Yes, I'm here.

DR. WADE: Oh, okay. Welcome, Denise. Thank you for -- thank you for joining us.

MS. BROCK: And thank you for having me.

DR. WADE: It's our pleasure.

MS. MUNN: Hi, Denise.

MS. BROCK: Hi, Wanda.

DR. WADE: Okay. Well, let me begin again. My name is Lew Wade and I have the privilege of serving as the Designated Federal Official for the Advisory Board on Radiation and Worker Health. By way of an overview, what we're

engaging here is a telephone meeting of a working group that has been established by that Advisory Board.

I'd like to provide you with a little bit of context for the working group, just to keep roles and terminologies straight. The Advisory Board is currently working on two things -- on a number of things, but two as it relates to this call. The Advisory Board has before it an SEC petition on workers at Mallinckrodt and is deliberating on that.

Simultaneously, the Advisory Board is looking at the review of a site profile for Mallinckrodt. This Advis-- this working group is really looking at issues surrounding the site profile and its review and a give-and-take that's going on between the Board, the Board's contractor SC&A, and NIOSH. There is no question that in the Board's mind these deliberations as they relate to the site profile will relate directly to issues related to the SEC petition. But I think it is important that we understand that the discussion, at least as it's framed going in, is looking at the issue and the technical

questions related to the site profile.
The working group was -- was designated by the Board and it includes Mark and Wanda, Mike and Jim, with Richard acting as an alternate. Mark was asked and graciously agreed to chair that working group, and it's the first call of that working group that we're here conducting today. I will take the roll in a minute of Board members present. Again, it is important that we not have a quorum of the Board itself. If we do have a quorum then we're conducting Board business, and this has not been advertised as a Board call. So I will be taking a roll of Board members in a moment. If we have a quorum, which is six or more, then I would have to respectfully ask some of the Board members on the call who are not members of the working group to leave us, and I do that with respect and apologies.
We have decided -- the Board has advised and we all have decided that we would conduct this working group in a public forum. That is that the calls and meetings that the working group would conduct will be public meetings. We have allowed for no public comment period on this

call, although I would say respectfully if -- if a member of the public has a burning comment to be made, please feel free, although there is no public comment period scheduled and we're not -- we've allowed a couple of hours. We don't have time for long public comments, but certainly we don't want to stifle anyone. But I would ask that you be respectful of that situation.

We did announce this working group call in the *Federal Register* notice. We put it out on the NIOSH web site. We sent announcement to friends and those involved in this process. The Board in its deliberations also said that the SEC petitioners would be invited to this call and invited to fully participate, so it's important that those petitioners feel completely unconstrained in their participation, their questioning as it relates to this process as it unfolds.

Now by way of materials that I know the working group has as background, at the last Board meeting the Board did put together a document that's pertinent to this call. That document is entitled "Priority Issues for Demonstrating

Feasibility of Dose Reconstruction for MCW Destrehan Street Workers for the Time Period of 1949 to '57, List of Tasks Developed by the ABRWH", and that is dated July 6th, 2005. I'm under the assumption that all members of the working group have access to those materials. Let me read briefly from the beginning of that memo, and I -- I read now, quote (reading) The following is a list of tasks to be completed by NIOSH and delivered to the ABRWH workgroup and SC&A, Inc. for resolution. To allow for an adequate amount of time for SC&A/NIOSH/Board to complete comment resolution by August 23rd, the following schedule is set forth:

Item: Working group conference call for status report and clarification of task by July 26th. I add parenthetically that that's this call.

Next item: NIOSH will provide a draft report on the following tasks in consultation with SC&A by July 31.

Item: Workgroup meeting between July 31 and August 8. Again I add parenthetically, it's terribly important we schedule that specifically on this call so that we can announce that meeting in the *Federal Register*

and the other mechanisms we've talked about.
Item: SC&A to review the NIOSH response to the tasks and issue a report to Board by August 16 (one week before Board meeting).
And item: Workgroup conference call for comment resolution between August 16 and August 22.
I'll stop reading at this point because I think it's important to set the context for what the Board was asking this working group to do and the time frames, and much of this call is, again, for clarifying of issues and procedures and steps that we'll take specifically.
So again, those conclude my introductory comments. Before I turn it over to the Chair, I would ask, though, at this point that members of the Board on this call identify themselves and just in any order you wish, please.
MR. GRIFFON: I'm Mark Griffon.
DR. WADE: Okay, Mark. Next?
DR. ROESSLER: Gen Roessler.
DR. WADE: Gen. Next?
MR. GIBSON: Mike Gibson.
DR. WADE: Next?
DR. MELIUS: Jim Melius.

DR. WADE: Next?

MS. MUNN: Wanda Munn.

DR. WADE: Next?

(No responses)

DR. WADE: Thank you. That's five, that is not a quorum. Again, if I hear another Board member join, I will take that role again and -- and will make the appropriate adjustments. Might I ask the NIOSH or CDC or Department of Labor representatives on this call to identify themselves? Again, this is Lew Wade. I work for NIOSH.

DR. NETON: This is Jim Neton from OCAS.

MR. ELLIOTT: Larry Elliott.

MR. MACIEVIC: Greg Macievic.

MR. SUNDIN: Dave Sundin.

MR. KOTSCH: Jeff Kotsch with --

MR. TAULBEE: Tim Taulbee.

MR. ALLEN: And Dave Allen.

MR. KOTSCH: I'm sorry, Jeff Kotsch with the Department of Labor in Washington.

DR. WADE: Thank you.

MS. HOMOKI-TITUS: Liz Homoki-Titus with the Department of Health and Human Services.

MS. CHANG: Cha Cha Chang with NIOSH.

MS. HOWELL: Emily Howell with Department of Health and Human Services.

DR. WADE: Okay. What about members of the Board's contractor, SC&A?

DR. MAURO: John Mauro.

DR. MAKHIJANI: Arjun Makhijani.

DR. ANIGSTEIN: Bob -- Robert Anigstein.

UNIDENTIFIED: (Unintelligible)

DR. THORNE: And Mike Thorne.

DR. WADE: Okay. Petitioners involved in the -- the Mallinckrodt petition that's before the Board, if they would identify themselves, please.

MS. BROCK: Denise Brock, petitioner.

DR. WADE: Okay. Now if any other member of the public would like to identify themselves -- it is not required, but if you would like to identify yourself, please do.

DR. MCKEEL: This is Dan McKeel in St. Louis.

DR. WADE: Welcome, Doctor.

MS. BERRY: Mary Berry of (unintelligible).

MR. SAMSON: This is Bob Samson from GAO, and I'm joined with Mary Nugent and Sandra Sheffits.

DR. WADE: Welcome.

MR. ERLICH: This is Dave Erlich from GAO in Chicago.
DR. WADE: Welcome. Okay, Mark, that's the business that I felt compelled to do. It's all yours.
MR. GRIFFON: Okay.
MR. KENOYER: This is Judson Kenoyer. There are other contractors to NIOSH that are on this call.
DR. WADE: I'm sorry, please identify yourself.
MR. KENOYER: Judson Kenoyer.
MR. SKALSKI: Ted Skalski.
MR. DEVANNY: John Devanny.
MS. BLOOM: Cindy Bloom.
MR. GUIDO: Joseph Guido.
DR. WADE: I apologize to you.
MS. WESTBROOK: Janet Westbrook.
DR. WADE: Okay, Mark. Please.
MR. GRIFFON: Okay. Lew, you set this up nicely. This is a large workgroup. Anyway, I think mainly the reason we wanted this conference call was to touch base early on in the process to see whether the list of tasks laid out in this memo that Lew mention need any clarification or -- or there's -- there's

technical issues surrounding those tasks before -- we don't want to find out too late in the game, right before the advisory meeting, so that was the main reason for this -- this call, and also to look at a time line. And I think as Lew said, to select a specific date and time for that end-phase workgroup meeting, which will be next week some time.

So I guess to start on the scope -- I mean I really think that it -- it -- I'll -- I'll turn the question over to -- to NIOSH, I guess Jim Neton, and ask if there's any questions on -- on the scope that -- that need to be addressed on this call.

DR. NETON: Yeah, this is -- this is Jim Neton. I don't have any specific questions. I think that we -- we delineated the scope fairly well at the Board meeting. So really I don't have any significant questions to ask. I am prepared to do a report --

MR. GRIFFON: Oh, okay.

DR. NETON: -- a brief report on -- on some of the progress we've made, which I think is significant, although -- you know, I recognize we're under a tight time line so this -- what

I'm reporting is -- is fairly new, even to me as of this morning, but if you'd like me to do that, I can -- I can --

MR. GRIFFON: Yeah, definitely.

DR. NETON: -- at least (unintelligible) where we're at.

MS. MUNN: Yeah, I'd certainly like that.

MR. GRIFFON: That would be good, yeah.

DR. NETON: Okay. I'll just start from the top down, item one -- number one, which is the handling of the raffinate -- and by the way, anyone from -- from NIOSH and -- and/or ORAU team that's on here that, you know, can -- hears me say something incorrect or can flesh out a little more detail what I'm saying, please feel free. I -- I'm aware of what's going on, but some of the finer details are handled by -- by others who are on this call. Regarding the raffinate exposures, we have researched to some extent trying to come up with ratios for -- for the -- the raffinate in greater detail than what we had in the profile. And it was suggested, and we agreed, at the Board meeting that the use of the Fernald ratios for the raffinate may be a good -- good

-- good point to look at -- a starting point, and we did that. It turns out that much of the raffinate that was in the Silo One at Fernald, if not all of it -- we're not exactly certain on this yet, but I'll -- most, if not all, originated from Mallinckrodt. And we have Remedial Investigation and Feasibility Study Analyses that were core samples taken throughout the silos, and we have those ratios.

MS. BLOOM: Jim, can I jump in there for a minute? We --

DR. NETON: Cindy Bloom.

MS. BLOOM: -- do have information that indicates that 75 percent of the waste came directly from Mallinckrodt from Fernald, and the other 25 percent we believe went to Lake Ontario Ordnance Works, and then went back to Fernald. And indications are that it is, if not all K-65 -- or all from Mallinckrodt, it -- certainly most of it is.

DR. NETON: Thanks, Cindy. We also did -- that reminded me. We looked at the Lake Ontario Ordnance core data and we did not find any detailed isotopic information, but we did find ratio of radium to uranium -- or, you know, the

weight content of uranium. I think it was .05 percent or something of that nature.

The Fernald data, being fairly recent, are -- are, we believe, quite good. There are isotopic analyses for the majority of the dosimetric contributors in the decay chain, and so we -- we propose -- or we will be proposing that we use those ratios for what's known as the K-65 or the gang cake or the lead sulfate cake -- whatever that precipitate was when they -- the first precipitate when they -- they pulled out the radium (unintelligible) barium (unintelligible) in the process.

We have been looking high and wide for any information to support the Sperry cake --

DR. MAKHIJANI: Before you -- Jim, could I ask a question?

DR. NETON: Sure.

DR. MAKHIJANI: This is Arjun. You will propose that Fernald ratios from Silo One be used?

DR. NETON: Yes.

DR. MAKHIJANI: Okay. Thank you.

DR. NETON: And -- and we're still -- we're still in discussion about which value -- there

are -- there are median values, there are 95th percentile values, and of course we're not using the absolute activity content of those -- of those wastes, we're just using the -- the (unintelligible) of the isotopic contents themselves, the isotopes themselves.

Sperry cake issue from that waste stream, we've been looking far and wide and we -- we have not yet been able to come up with any definitive data that would tie a uranium measurement in urine to a Sperry cake intake. It turns out that Sperry cake -- as we all know, 20 tons of it or so went to Mound. We've researched -- I've personally gone back and looked through all the Mound -- as many Mound records as I could and found very detailed radiochemical procedures that they published in peer review journals on the protactinium analytical techniques for that Sperry cake, but nothing that would flesh out the uranium amount.

We do find a lot of evidence that the Sperry cake itself was a very wet -- pasty, to use their terms -- material, about 50 percent (unintelligible) and the rest is wet type waste, so it still indicates to us that this

material was not particularly prone to become airborne during the processing of it. But we still have some work to do there. I'd like -- I (unintelligible) locate some papers on isotopic analysis of protactinium (unintelligible) published (unintelligible) *of Chemistry*, so there's a few other sources to uncover there.

The -- the (unintelligible) intake when we have these combinations of data -- and -- and Cindy Bloom could probably speak to this a little better, but I think -- like I said, I know at the Board meeting we indicated we would -- we would calculate -- if we had urine data, use the urine data to estimate intake, and then look at the air -- the corresponding air concentration data and pick whichever is the higher value for the intakes. In discussion among ourselves, we now believe that a more appropriate approach is -- when we have good urine data is to rely on the urine data itself for the intake, and then apply the ratios that were observed in the K-65 silos to come up with intakes, at least for what we would call K-65 -- people who were exposed potentially to K-65

materials.

MS. BLOOM: I would take a small step back there for a minute, Jim. I think what we talked about was using the uranium urinalysis data and the radon breath analysis results if we have both of those. If we don't, we're -- we're looking at using the Fernald ratios, but we're also looking at the available coworker data and we've done some preliminary results -- analyses that indicate that the Fernald ratios are really at the very, very high end of what might be an exposure, somebody who only worked with K-65. Based on the data we've seen so far, it looks like there is no such thing as a pure K-65 source term, that it's really a mixed source -- you know, people were exposed to uranium, that that was forever in the background, or that job rotation resulted in -- in changing those ratios significantly by the time you get to the worker.

DR. NETON: Right. Thanks for that clarification, Cindy. I was going to -- going to mention that, but interesting analyses are -- and honestly, for -- if Joe Guido's on the phone, I know he's been trying to pull out

raffinate workers. He's having difficulty finding what we consider raffinate workers without ra-- corresponding radon breath data. There's a fair amount of that available. It turns out, as Cindy said, that the radon breath data do -- do bound the radium intakes for these workers considerably, much -- much -- not much low-- well, a fair amount lower than what you would infer from using the K-65 ratios, so that --

MS. BLOOM: By a factor of 20.

DR. NETON: Yeah, it's -- it's lower, and I think we feel pretty good that at a minimum the K-65 ratios will bound the intakes, and at best we may be able to use these radon intakes -- or the radon breath analyses to -- to actually define the intake for radon -- radium. But we need -- we need to demonstrate that and prove that a little more conclusively if we're going to go down that path.

Did I hear someone want to make a comment on that or...

(No responses)

DR. NETON: Okay. So we -- we've made very good progress in those areas. Related to

sufficient data available for radon dosimetry -- radon exposure estimates, we have looked at the radon -- the 5000 plus radon points that we have in the CER database, and I don't know if I reported on this at the Board meeting or not, but these data, by year, fit a fairly decent lognormal distribution, as well. And more importantly, if one goes into the description of where the samples were taken, we do have pretty good descriptions of where they were. I mean they're -- they're identified by feinc filter press or a digester area or a furnace. So in effect, it seems to me that most of the samples in those 5000 sets were taken in or near Plant 6, which makes some sense. This is where the radium source term was present. So we've done some -- some more detailed analyses by job category or work location in the plant as to what the distributions are at the higher -- higher potential exposure locations, so the -- the story, though, remains to be seen as to how -- how much detail we can assign to these radon exposures. At this point we're at -- at best only be able to propose that we would assign a distribution of radon --

assign a distribution of exposures between people who worked in the plants and people who most likely did not frequent the plants, such as administrative folks. We're still working on trying to make a determination if we can refine the in-plant exposures to radon into what we would call a high and low exposure groupings.

In any case, all these groupings would be by a distribution, not a specific value. For example, we would propose the 95th percentile radon distribution for the higher exposure category if that's indeed where they fell out. So we have plenty of data to do this. One would think that this would result in really large radon exposure, and it turns out that the radon exposures were very significant in the first several years, the '49-'50 time frame, and dropped off quite precipitously after that. So you know, you don't run into the situation of having these huge, massive exposures over the entire duration of the cohort. I guess that's probably neither here nor there, but I do want to point out that we do have very large exposures in the early days, which -- which

makes sense. And as controls got better and some of the pitchblende content was reduced in radium, the exposures went down.

That leads me into the other area of the radon dosimetry issue which had to do with the calculation of internal exposures, non-lung-related exposures from inhalation of radon and progeny. We've taken a look at the SC&A calculations and, while they're correct in what they have done, the approach of using this dose conversion factor -- we believe that at least in ICRP-71 where they provide these factors there's some specific guidance that says that these should not be applied to use of radon daughters, or radon progeny. And in fact we -- we've researched this a little further and have found some -- a publication by, I think I mentioned this at the Board meeting, Marshall and Burchell -- Alan Burchell of course is a well-recognized expert in the radon dosimetry arena -- where they have determined the half-life of lead and bismuth in the lung to be somewhere -- ten and 13 years, respectively -- hours, I'm sorry. Not years, hours. That is a huge difference in the amount of dose delivered

to the systemic organs.
I believe that the type F, the intake calculations that were in the SC&A proposal, would -- would essentially inject ten -- material -- almost all the material went into the bloodstream with a ten-minute half-life or something like that. And we -- we -- we've redone all these calculations and -- and modeled -- we specifically modeled the ICRP calculations, which is using the ICRP lung model using the method proposed by Burchell, and have concluded that the doses to the organs -- the systemic organs are -- are much lower than those proposed at least by SC&A using our approach.
Now that said, there's still a couple of organs that are higher than the -- the radon gas model that we had proposed at the Board meeting. There's a number of publications out there, and it's pretty well recognized that a major source to systemic organs from radon exposure -- the -- the major source would be from the deposi-- or the -- the absorption of radon gas in the soft tissues and the ultimate decay of the gas through the progeny chain in the -- in the

organs themselves. There's some solubility coefficients that can be applied and -- there's a couple of really excellent papers out there. Naomi Harley has one and there's another paper, I forget the person's name right now, but it's a pretty good -- what they call a dynamic model.

In almost all organs that we modeled using the radon gas deposition model, I think the doses for the particulate using the method that I just described are about two percent of the -- two to three percent of the radon gas doses, the notable exceptions being the kidney and the gastrointestinal tract. I think (unintelligible) still proposing to use the radon gas model to estimate doses. In fact, the doses are not super-significant. I think they -- I wouldn't be quoted on this. Of course this is probably recorded, but it's somewhere around a couple millirem to the organ per picocurie per liter from the radon gas. Is that right, Dave? I -- I'm just -- just to give you a sense of what these doses might be.

MR. ALLEN: (Unintelligible) millirem per year for gas.

DR. NETON: All right, I'm sorry. It's less -- it's about .6 of a pic-- of a millirem per year per picocurie per liter of the gas. Of course that's -- in -- that's -- that's irrespective of equilibrium ratios because we're just talking about the gas. And then the -- the progeny doses are around .02 to .03 millirem per year. But the kidney values are -- are larger. You could get about 1.2 millirem per year to the kidney from the -- actually the progeny dissolving in the lung and becoming systemic.

So we -- we're going to -- we'll have a model to -- to address this and -- and how we will -- you know, we'll propose the model and put this forward and it -- we propose to add these doses to -- to the -- to the dose reconstruction as appropriate based on the radon exposure distributions we'll apply in the plants. We don't expect those still to be tremendously high doses, though, compared to the intakes that would result from the raffinate materials.

MR. GRIFFON: Okay.

MS. BLOOM: I don't know if it's appropriate to weigh in here, but I know that one concern that

I -- or one -- one -- not a concern, but I -- I think that this is excellent work, and certainly those numbers are of interest. But I think when we're finding they're so low and we have so much -- we're pretty convinced that our ratios that we're applying to the other radionuclides are pretty large, the question comes up, do we really need to take this extra step in dose reconstruction on every case to add in these essentially trivial doses, for the most part. And so that's -- that's one question that I think needs to be out there, as well.

DR. NETON: That's a good point, Cindy. I don't think we'll (unintelligible) probably address this and then solve this in this call, but --

MR. GRIFFON: Right. Right, and my sense is if this -- you know, we come to some agreement on the model, then -- then we can have that discussion --

DR. NETON: Right.

MS. BLOOM: That it's (unintelligible).

MR. GRIFFON: -- (unintelligible) and whether it's appropriate or not, yeah.

DR. NETON: Right. I mean if you look -- if you have .6 picocuries per liter -- you know, if you have 100 picocuries per liter assigned year -- you know, 24 --

MR. GRIFFON: Yeah.

DR. NETON: -- year round, your 66 picocur-- 66 millirem is not a huge dose when some of these raffinate doses, even to non-systemic organs, are going to end up being probably on the order of -- of below rem ranges, even the non-- even the non-metabolic organs.

MR. GRIFFON: Right.

DR. NETON: So -- but we -- we can deal with that, but we -- we'd like to get our approach in writing and out there for folks to -- to evaluate it.

MR. GRIFFON: Okay.

DR. MAKHIJANI: Could I make a request? This is Arjun.

DR. NETON: Sure.

DR. MAKHIJANI: For the references that you're using to develop this approach so we can also get them and be looking at them in parallel as you're doing this and --

DR. NETON: Sure.

MR. GRIFFON: (Unintelligible)
DR. MAKHIJANI: -- (unintelligible)
DR. NETON: Do you want them right now, or...
DR. MAKHIJANI: Well, if you can just send them in an e-mail --
DR. NETON: Okay, I will send them --
DR. MAKHIJANI: -- to the working group and -- and to us, that would be -- that would be useful.
DR. NETON: Absolutely.
DR. MAKHIJANI: Thank you.
DR. NETON: This is actually very cutting edge material. I mean there -- there's a lot of -- not a lot of work has been going -- done in this area, and -- and most of it's been done to refine the dose to the lung using the ICRP-66 (unintelligible) model.
MR. GRIFFON: Right.
DR. NETON: We're using it for the -- for the systemics. It's applicable, and I think that we got a -- a fairly decent handle on it. Okay, item number three, which is the application of correction factors for external doses to organs, Tim Taulbee and Greg Macievic -- Greg is the one -- I presented the

information at the last Board meeting -- who used the Attila code to estimate relative photon fluxes between a lapel badge and the lower torso in specific response to different geometries. Tim has worked closely with Greg and they've put together what we call a Technical Information Bulletin, a TIB. That's in draft form now. And we are proposing, based on their analysis, that doses for -- external doses for specific categories of workers at Mallinckrodt be multiplied by a correction factor of 2.1 for organs that are below the lung. That is organs residing in the lower torso area, and we've very specifically delineated which those might be.

The trickier part then is to determine which workers this correction factor would apply to. Tim has gone through the claims that we have in-house to process and has determined that the individual job categories we have are -- how would you say it, Tim? -- are too -- too narrow in focus or narrow in scope to be able to make a determination on an individual job category (unintelligible) category.

MR. TAULBEE: Right.

DR. NETON: And maybe you could explain what you've done.

MR. TAULBEE: Sure. In going through the worker -- work history information, as well as their dust concentration cards, you get a feel for what individual workers were doing. However, it's pretty clear that some of their jobs were near -- what we would call near-hand exposure fields, and other jobs were not. So you've got a mixture within a particular worker over their time period where sometimes they were close-handling materials, other times they were not. And so it's really not possible to break out in more detail which of those near-hand exposure fields had contributed to their lapel dose more than other exposures did. So what we're proposing is, just based upon general worker categories such as operators or the crafts, that we would assign this correction factor to. And this makes up a population of about 57 percent of the current claims that we have and we wouldn't be applying this type of correction factor to any administrative personnel -- accountants, secretaries, cafeteria workers (unintelligible)

sort of thing. So this would only be applied to those people who worked in the plants, the chemical production operators, material handlers, and then each of the crafts -- the pipe fitters, the carpenters, the sheet metal workers, et cetera.

MS. WESTBROOK: This is Janet Westbrook. Did you look in the AEC and Mallinckrodt dust study reports where they in fact break down what the workers were doing, and even sometimes tell you how far away they were?

MR. TAULBEE: Yes, I did, Janet. I had looked at that. The problem that you end up with is that in some cases, even though it was a short duration type of an exposure, you don't know what the external dose rate coming off of the object was at that time period without going through the survey data -- the individual survey data and trying to marry that up with that particular time (unintelligible) just be very cumbersome.

DR. NETON: It becomes a very practical limiting factor at that point. (Unintelligible) that's our proposal. Again, this is -- this is not a finalized -- it's a

draft proposal, but this is where we are. Again, this is all works in progress here. (Unintelligible) any of this represents our final -- final solution to any of these issues.

MR. GRIFFON: Jim, just a -- a process question here. The -- the TIB that you just mentioned and the proposal --

DR. NETON: Right.

MR. GRIFFON: -- is there any way that could be provided in draft form before the face-to-face meeting next week?

DR. NETON: I think so.

MR. GRIFFON: Okay. I think that would be good, so people can look at it and digest it a little further and --

MS. MUNN: That would be very helpful.

DR. NETON: Right, yeah, I -- I'm struggling, I didn't -- a lot of this stuff is being developed, you know, as we speak, so I don't want to send out too draft material. But I think we're at the point where with this TIB I feel comfortable sharing it. And we could talk about how widely (unintelligible) they need to do that and -- you know, like I said, we can just refine the process after we go through our

-- our process here.

MR. GRIFFON: That's fine.

DR. NETON: In the area of intermittent exposures and incidents, we're still working on that and Dave's gone through some examples. We know what we need to do. We just need to find the right -- the right bracketing examples to -- to make the case, you know, for ourselves. So it -- we -- we're comfortable and confident that we will have this done in fairly short order, but it's just not -- not something right now that we're prepared to -- nor would it actually be conducive to discussion on a telephone call.

MR. GRIFFON: Yeah.

DR. NETON: So I will -- we -- we will have some examples to -- to (unintelligible) show. This number five -- let me just look at four again to make sure I didn't miss something. Yeah, that's -- that's essentially --

MR. GRIFFON: Jim, for four, I think that would be good. When we're in Cincinnati that would be something that you could (unintelligible) there for us.

DR. NETON: Yeah.

MR. GRIFFON: Yeah, okay.
DR. NETON: Yeah, we'll have graphs and pictures.
MR. GRIFFON: Yeah.
DR. NETON: Pictures are the best descriptors. I've got four or five examples, but I'm working with Dave trying to come up with the best -- best possible examples to elucidate this. Number five, specification of dose reconstruction for unmonitored workers, we looked through every single page of the -- actually Tim Taulbee -- I'll give credit where it's due -- looked through every single pages of the six boxes and really could only find I think one or two pages of documents that talked about environmental exposures at Mallinckrodt. I believe that they were just -- not just, but stack emission reports. I -- I was hoping that we would find something a little more of substance like, you know, area monitoring data around the site or something like that. But there's very little that we'll be able to do with stack emission reports, unless we missed something and there's additional data out there.

Absent any additional information, we're going to propose to use the -- the coworker -- the worker distributions at Mallinckrodt for people who were unmonitored and we have no other way to -- to assess their exposures. If we can determine, for example, that they were more administrative type or had lower exposure job categories than the monitored workers, we would propose to apply the full distribution of the coworker data. As our know, our -- our approach lately has been when the worker is -- is more heavily exposed or -- or was -- should have been monitored, we would apply the 95th percentile distribution. For this particular instance we would apply -- we would apply the -- the distribution of the coworker data and assume that that person falls somewhere in that distribution. That's as fine -- finely tuned as we can make this at this time.

MR. GRIFFON: Can I ask, Jim --

DR. NETON: Yeah.

MR. GRIFFON: This is Mark Griffon. Arjun had raised this -- this -- Arjun had mentioned that you -- he found some additional data. Arjun, I mean if you -- if you have the references or

the specific pages out of those six boxes, I think you said that some of it was in there, maybe you can --

DR. NETON: Right.

MR. GRIFFON: -- share that with NIOSH so that -- we're not -- at least consider it, you know. Maybe it's still that you'll use that same approach that you mentioned, but at least so that everyone's on the same page here.

MR. TAULBEE: I guess -- this is -- this is Tim Taulbee. I have a question I guess for Arjun. Is there -- what you were talking about at the Advisory Board, is it anything other than these stack emission estimates of the pounds of uranium within those boxes?

DR. MAKHIJANI: No, Tim, I did not find anything other than -- I gave the reference to the document --

MR. TAULBEE: Okay.

DR. MAKHIJANI: -- in -- in the report, and -- and I don't -- and I haven't gone through -- I'm sure NIOSH has gone through the boxes a lot more thoroughly than I did. I did not find anything else. And emissions estimate is a partial emissions estimate.

And my other observation that I'd just like to make, which I think I made at the Board meeting, is generally whenever these estimates have been gone over in more recent times, they've always been found to be underestimates. And so it -- it's -- the emissions are indicated to be pretty significant from the stacks and would, you know, affect outside workers. And I don't -- so my question really relates to (unintelligible) you calculate the outside doses on the people who were moving things around and loading and unloading and who may not have been monitored and so on.

MR. TAULBEE: Okay.

MR. GRIFFON: It sounds like we're talking about the same data, anyway.

DR. NETON: Again, I think that there's very little that we're going to be able to do with stack emission data like that. I think proposing -- you know, our proposal to use the 50th -- the full distribution of the coworker data that we have I think is a reasonable approach.

We -- we have gone through, by the way, and developed coworker (unintelligible)

distributions by year (unintelligible) workers and Cindy and Joe and others at ORAU are working through those things now and developing our approaches somewhat. We've elucidated a little bit, to the extent we're doing that using the radon breath data to bound some of these intakes for uranium and -- we actually are also going to propose, I believe, that if we do not have bioassay data for workers -- if you remember, I reported at the Board meeting that we had at least one bioassay sample for I think it was around 80 percent of the claims that we have to process. Those -- those cases where we have no bioassay data, we will -- we propose now that we would use the coworker urine distributions to estimate intakes rather than to default to the air sample data.

A couple of reasons for that. One is this -- the radon breath bounding analysis indicates that the air data are probably largely overestimates of the intakes, and we just believe that sticking closer to bioassay data is a more prudent thing to do. It's -- it gives you a better picture as to what the actual intakes were since you're measuring what

-- what the people actually breathed. And that's -- that's a proposal that we have out there.

Okay. One other thing on number five is there's a issue related to SLAPS workers. We -- we've talked among ourselves about this a fair amount and it's our opinion that the workers who were at the SLAPS facility --

UNIDENTIFIED: I have a question.

DR. NETON: Yes?

(NOTE: The ensuing conversation had no relation to the teleconference but resulted from malfunctioning telephone lines allowing other parties to become included on the subject call.)

MS. MUNN: We can hardly hear you.

DR. WADE: I think -- is this related to the -- to our call on the radiation board?

DR. NETON: It almost sounds like we have two calls going on at the same time.

DR. WADE: Yeah, why don't -- I'm sorry about that. Why don't you continue, Jim.

DR. NETON: The SLAPS workers we -- we believe were not assigned there full time. In fact, they spent a large, if not the majority of

their time working in a plant. So if that's the case, then we believe assigning the plant distributions or the -- the monitoring data to them would be a reasonable approach.

Okay, getting down to number six, the example dose reconstructions, ORAU has pulled a number of cases. I don't -- I've forgotten the number now, but Joe, help me out here --

MR. GUIDO: Yeah.

DR. NETON: -- is it eight?

MR. GUIDO: There's nine raffinate workers and eight thorium workers that I identified that are currently claimants that fit some criteria that -- basically they're definitely either raffinate or thorium workers, either because they had very high external exposure and breath radon monitoring, and had descriptors with their bioassay data which definitely -- folks handling those materials. Or, for the thorium workers, those were a little easier. There's some ionium bioassay chain of custody forms that we've located, and so those clearly indicate people handling the thorium materials, or people who had uranium samples with descriptors that said ME process or Plant 7E,

so --

DR. NETON: Right. I'm sorry, go ahead.

MS. MUNN: This is Wanda. I was just commenting that was good news to have that kind of data.

DR. NETON: Right. So the thorium bioassay data we have at least for seven workers from -- seven or eight, I forgot what Joe said --

MR. GUIDO: It's seven workers with ionium bioassay. There -- there's a couple other workers that were identified as Plant 7E on other -- through other means that did not have bioassay, but -- and these are claimants. I mean I'm not talk-- there's probably more that were on the sheets, but I'm talking about actual claimants, current claimants.

DR. NETON: Okay, so we -- we pulled those and Joe's been working diligently to -- to start the dose reconstructions using the data we have, and I -- I believe I would characterize these as fairly well-monitored workers, if I could use that term. And Joe's going to develop the distribution, the uranium intakes and then the radium intakes based on the activity ratios that we propose using the

Fernald silos, and then come -- came up also with radium intakes based on the radon breath analyses that we have for these folks. And then I think we can go and pull away parts of the data and then demonstrate what we would do if those data points were not there, which I think is one of the, you know, concerns and -- and how that would change the picture and the relative magnitude of the intakes.

I think since we're now going with coworker urine data to a large extent, I don't suspect that things are going to change too much. It keeps us from having to use some of these very large air concentration results which, even when I talked at the Board meeting last time, I demonstrated to a large extent the air concentration data were -- were somewhat higher, that they were general area samples that had not really intended to indicate worker intakes. But --

MR. GUIDO: Jim, this is Joe Guido. I wanted to interject something here --

DR. NETON: Sure.

MR. GUIDO: -- too. It's my intention also in doing the dose reconstructions, the radon

breath monitoring data -- not only does it bound the -- the radium intake that's associated through those ratios, but it -- but it also -- my intention is also to use it to bound the -- the thorium -- you know, the other progeny that in the ratios, like the thorium --

DR. NETON: Right, yeah, I --

MR. GUIDO: -- (unintelligible) even actinium. I just wanted to make sure -- you know, get that out there, make sure that --

DR. NETON: Good point, Joe. I think it's reasonable -- it's a reasonable approximation to say that once we know what the bounding radium intake was and scale the progeny in relation to the radium based on what we see in the silo material. By the way, there -- there's a fair amount of thorium-230 -- I was surprised -- in the airport -- in the K-65 material.

MS. WESTBROOK: Could I interject something? This is Janet Westbrook. With regard to the yard, you know they did take some dust samples (unintelligible) workers (unintelligible) there in the yard, in the guard tower and so forth, so that they could calculate those exposures

for those particular job categories, so we do have some yard air data. And not only that -- oh, I forget, Neton just said something and I wanted to speak to that a little bit, but I -- the moment passed. Sorry about that. But anyway, we -- we do have a little yard data, but we don't -- have no environmental (unintelligible).

DR. NETON: Right, I appreciate that, Janet. We'll have to take a look at that and see if it's -- gives us enough robustness to extrapolate to workers throughout the site and by year and such. It might give us some -- a good feel for bracketing, you know, values. Let's see, where was I with -- I think I've covered pretty much where we are, so I -- I hope you feel we've made -- we've made a lot of progress. I mean we've been -- folks -- and I give credit to all the folks at ORAU and NIOSH that have really been burning the midnight oil to -- to bring this to completion, and we look forward to resolution of these issues.

MR. GRIFFON: That -- that -- that sounds good, Jim. I -- I was going to ask -- 'cause I think I'm going to have to pull off this call in

about ten minutes, but one thing I wanted to do before I left the call was to talk about the next -- the face-to-face meeting when I think we'll see some of your -- your final products here, or -- or near final products, anyway.

DR. NETON: Sure.

MR. GRIFFON: And I wondered if we can finalize a date on that. I was hoping for August 3rd or 4th. I don't know how that times works for the other workgroup members or NIOSH.

DR. WADE: Well, I would ask for the 4th.

MR. GRIFFON: The 4th, yeah.

DR. WADE: Could I poll the workgroup members and -- and get a sense -- Mike a meeting on the 4th in Cincinnati?

MR. GIBSON: Yeah, the (unintelligible) -- yeah, the 4th looks okay.

DR. WADE: Okay. Wanda?

MS. MUNN: The 4th is fine.

DR. WADE: Jim?

DR. MELIUS: Yeah, I can do the 4th.

DR. WADE: Okay. And Mark, obviously you can do the 4th. Okay --

MR. GRIFFON: And I was thinking we could start it, you know, late enough that people can

travel in that morning -- at least myself.
MS. MUNN: With one exception.
MR. GRIFFON: With one exception, right.
DR. WADE: What time were you aiming for, Mark?
MR. GRIFFON: I -- I -- I think 9:00, 9:30, 10:00, you know -- probably -- maybe 9:30.
DR. WADE: Okay, let's say 9:30 a.m. on the 4th. That's next Thursday. Again --
DR. NETON: Mark, do we -- do we feel this will be a full -- full day meeting or...
MS. MUNN: I suspect it'll be close to it -- this is Wanda. That's just my guess.
MR. GRIFFON: Yeah, my sense is I think it may take some ti-- you know, by the time you --
DR. NETON: I don't want to shorten it, I just want to plan for, you know, what my schedule might be.
MR. GRIFFON: Yeah, I believe it will be -- I'm assuming it will be close to a full day, yeah.
DR. WADE: Is LaShawn on this call?
MS. SHIELDS: Yes, sir, I'm here.
DR. WADE: And we're -- we're sure we have coverage in terms of having a reporter there to take the transcript.
MS. SHIELDS: Yes, we'll -- we'll make sure we

have it.

DR. WADE: Okay, thank you.

MS. SHIELDS: Sure.

DR. NETON: I guess I didn't hear anybody from ORAU, the significant people that might participate.

DR. WADE: SC&A?

DR. MAURO: It's John Mauro. I can make it. Arjun, are you available?

DR. MAKHIJANI: Yes, yes, I can be there.

DR. WADE: Okay. We'll have to work out location, but let's assume it will be 9:30 next Wednesday, the 4th of August, in Cincinnati. And we'll get back to you with location.

UNIDENTIFIED: (Unintelligible) that's a Thursday.

DR. WADE: I'm sorry, Thursday the 4th.

UNIDENTIFIED: Yes, correct.

DR. WADE: I'm sorry if I misspoke, Thursday the 4th at 9:30 a.m.

MS. BROCK: And this is Denise Brock. I'm hoping someone can get back with me, as well, so I know where it's located at.

DR. WADE: Okay. We shall, Denise. Does that time work for you, as well?

MS. BROCK: That's fine, certainly.
DR. WADE: Okay, thank you.
MR. GRIFFON: Okay.
DR. WADE: Are there other time frames we need to work out, Mark, while we have you on?
MR. GRIFFON: Yeah, I -- I -- the only other thing I -- I -- looking at your e-mail, Lew, that the discussion of the first time line that you went through sort of, I'm -- I'm assuming that -- that we're still -- that's still going to work with everyone? We sort of have that one deadline, anyway, of the -- of the Board meeting itself --
DR. WADE: Right.
MR. GRIFFON: -- so there's not a lot of flexibility in there. But I think everybody's still on line with those time frames. It sounds like -- Jim, it does sound like you've made a lot of progress on this.
DR. NETON: Yeah, I recognize -- I'd like to get these work products out as soon as possible so that people can have at least some heads-up before the Board -- before the meeting on the 3rd -- or the 4th, I'm sorry. And if it's okay, these are going to maybe come out, you

know, as I can issue them.

MR. GRIFFON: That -- that's fi-- I mean --

DR. NETON: (Unintelligible) I've got a way to do that.

MR. GRIFFON: -- understandable, you know, yeah. Yeah.

DR. NETON: So -- and some of them will be -- be in draft form -- again, subject to change, but at least you'll -- you'll get our -- a sense of our line of thinking on this and be better prepared to discuss the issues.

DR. MAKHIJANI: Generally by July 31st, Jim? This is Arjun?

DR. NETON: Yeah, I'll -- Arjun, that was our -- our deliverable date to you guys and I will get as many, if not all, of them to you by -- out by -- by then. I assume I (unintelligible) those to the Board members.

DR. MAKHIJANI: I had one question on radon breath that was -- will -- will there be included some assessment of the validity of this data since there were questions about at least a part of it?

MS. BLOOM: In terms of questions, could you --

DR. MAKHIJANI: Well --

MS. BLOOM: -- (unintelligible) of what that means?

DR. MAKHIJANI: -- I -- I referred to some of it in the -- we referred to some of it in the -- in the report that we filed. It (unintelligible) reference (unintelligible).

DR. NETON: Yeah, I'm familiar with what you're speaking of, Arjun --

DR. MAKHIJANI: Yeah, great.

DR. NETON: -- and I know of at least -- there's two issues. There's -- one is -- there's the zero issue and then the other issue was that -- the data came into question, but everything that I've read thus far only indicates that it would -- (unintelligible) the inclusion of background radon in the results which would lead to higher estimates than lower estimates.

DR. MAKHIJANI: Okay. But you have something there on it.

UNIDENTIFIED: But it was only in the early years, the years as a SEC class. Right?

DR. NETON: I'm not sure. We'll address it, though. We'll -- we'll take a look at that. And you're right, Arjun, we need to -- we need

to close that loop.

DR. MAKHIJANI: Thank you.

DR. NETON: You're welcome.

DR. MAURO: This is John Mauro. Lew, could you confirm the full Board meeting location and dates? Has that been published?

DR. WADE: Yeah, I mean the location is St. Louis, Missouri and the dates are -- although they haven't been announced, it's our intent of the 25th and 26th of August.

DR. MAURO: Thank you.

DR. WADE: Mark, anything else you think we need to --

MR. GRIFFON: No, I -- I -- you know, I think we've covered most of it. I mean really with -- that's exactly what we wanted was kind of a status report, and I think everybody knows what we need to bring to next week's meeting, so that's -- it sounds like we're on a pretty good schedule here.

DR. ZIEMER: Mark?

MR. GRIFFON: Do any other workgroup members have anything to add?

DR. ZIEMER: Mark?

MR. GRIFFON: Yeah.

DR. ZIEMER: Yeah, Paul Ziemer here. I -- I was only able to get on sort of at the tail end of the discussion, but I just wanted to make sure that the workgroup has everything and you're satisfied with where we are on the schedule. This was more of a status report meeting, really.

MR. GRIFFON: That's right, and I think -- I think Jim -- Jim's just committed to getting these deliverables to us before the --

DR. ZIEMER: Right.

MR. GRIFFON: -- the face-to-face meeting next week.

DR. WADE: I think with -- Paul, on the call, though, we do have a quorum of the Board, so I think we need to --

DR. ROESSLER: Lew, I'm going to hang up.

DR. WADE: Thank you. Okay, sorry about that. I just -- they -- they pay me to watch that.

MR. GRIFFON: I (unintelligible) thinking of that.

DR. WADE: Okay. Paul, did you get your question answered?

DR. ZIEMER: Yeah, I just wanted to make sure that the -- that things were on schedule for

the face-to-face meeting coming up of the workgroup.

DR. WADE: Okay.

MR. GRIFFON: It sounds like we are on schedule.

MS. MUNN: And this is Wanda. I want to thank both the NIOSH and the SC&A people who have put in so much work on this. It's obvious there's been an awful lot of work since the last meeting and thank you. I know how tight that time schedule is on it.

DR. WADE: Thank you, Wanda.

MR. GRIFFON: Yeah, I think that goes for all of us. We appreciate your effort to get -- you know, to meet these tight time frames.

DR. WADE: Does anyone else wish to make a comment?

MS. WESTBROOK: I -- this is Janet Westbrook. I did remember what I -- earlier. Dr. Neton said something about all these samples were GA, but some of them in this -- were particularly high dose levels, they were breathing zone samples.

DR. NETON: You're right, Janet. I stand corrected.

DR. WADE: Okay, thank you. Okay, Mark, with your permission, I think we will conclude our business here. Again, there will be a transcript of this available. I can't promise the time frame, but you will hear from us within the next day or so as to the precise arrangements for the meeting next week in Cincinnati. I think --

MR. GRIFFON: Unless any of the workgroup members have anything to add, that's -- that's fine, Lew. Does anyone else have any comments?

MR. GIBSON: No, I don't. I think we're --

MS. MUNN: Sounds like we're done.

DR. WADE: Thank you all very much.

MR. GRIFFON: All right. Thanks a lot.

(Whereupon, the meeting was concluded.)

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I, Steven Ray Green, Certified Merit Court Reporter, do hereby certify that I transcribed the above and foregoing from the day of Jul. 26, 2005; and it is a true and accurate transcript of the testimony captioned herein.

I further certify that I am neither kin nor counsel to any of the parties herein, nor have any interest in the cause named herein.

WITNESS my hand and official seal this the 29th day of August, 2005.

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