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

THIRTY-FIRST MEETING

ADVISORY BOARD ON

RADIATION AND WORKER HEALTH

DAY TWO

The verbatim transcript of the Meeting of the Advisory Board on Radiation and Worker Health held at the Chase Park Plaza Hotel, St. Louis, Missouri, on July 6, 2005.

C O N T E N T S

July 6, 2005

TRANSCRIPT LEGEND

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(in order of appearance)

DR. ARJUN MAKHIJANI, SC&A
DR. JIM NETON, NIOSH
MR. LARRY ELLIOTT, NIOSH
DR. PAUL ZIEMER, CHAIR

STAFF/VENDORS

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LEACH, BOB, MALLINCKRODT
LICAVOLI, JOSEPHINE, MALLINCKRODT SURVIVOR
LOVETT, BRICE, UNWW
MAKARA, MEL, SELF
MAKHIJANI, ARJUN, SC&A
MALDENHAVER, RUBY, MALLINCKRODT
MAURO, JOHN, SC&A
MCBRIDE, MOLLY
MCGRUEN, JAMES
MCKEEL, DAN, VILLAGE IMAGE NEWS
MILLER, RICHARD, GAP
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MUECKE, EDWARD
MULEHOUR, BOB, SON OF (RICHARD)
NAGLE, KATHLEEN, DAUGHTER
NITCHMAN, JOHN
NOVAK, JUSTINE, MALLINCKRODT
PEDERSEN, ELAINE
POTTER, HERMAN, USW INT UNION
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P R O C E E D I N G S

(9:10 a.m.)

WELCOME AND OPENING COMMENTS

DR. ZIEMER: I'd like to call the meeting to order. A couple of announcements before we return to our agenda. First a reminder to you to register your attendance. Even if you were here yesterday and signed in, we ask you to do that each day. This is everyone -- Board members, staff, members of the public.

Also if you need copies of the agenda or other related materials, those are on the tables in the room to my right, sort of toward the rear. So avail yourselves of those materials.

Dr. Wade has a couple of comments for us, as well, as we get underway this morning.

DR. WADE: Yeah, thank you, Paul. I just wanted to spend a minute sort of putting today in context. As you'll notice from the agenda, today is spent almost exclusively on issues related to Mallinckrodt, and I thought I'd provide you just a very brief background as to why we framed today the way we did.

You'll remember over the last several Board meetings there've been a number of actions related to Mallinckrodt. Two meetings ago this

Board approved an SEC -- the addition of a class to the SEC cohort for Mallinckrodt, the years '42 to '48. It did that for a number of reasons. One of those reasons was an issue of data reliability.

Two meetings ago as well NIOSH brought a petition evaluation to this Board to deny adding a class to the SEC for the years '49 to '57 for Mallinckrodt. At the last meeting the Board considered and debated that, and asked that two things happened as it postponed its decision. It asked that NIOSH go back and -- and come to this Board with reasons that the Board should not be swayed by issues of data reliability as it was when it voted on the '42 to '48 petition. Jim Neton had presented some hypothetical examples to the Board as to why there was sufficient information and NIOSH felt it had a sufficiently robust dataset that it need not be concerned about issues of data reliability, and the Board asked for Jim to come back with real examples of that.

In parallel, SC&A was going through a detailed review of the Mallinckrodt site profile. The Board asked that SC&A continue its work into

the evaluation of that site profile and bring its findings back to this meeting.

So this morning we're going to start with some discussions about the site profile. SC&A's going to present its findings. Jim Neton is going to present some of the information that the Board asked him to bring back concerning why we had a sufficient data array not to be concerned overly about issues of data reliability.

Once we've finished those discussions of the site profile, then we'll spend our time addressing the open question of the SEC petition for Mallinckrodt for the years '49 to '57. So I think that's the context of the day as we face it.

DR. ZIEMER: Thank you, Lew. And one of the reasons that Wanda Munn perhaps felt it was deja vu all over again was -- was the fact that at our last meeting we had a review -- a Mallinckrodt-related review which raised a number of questions, and I think that NIOSH had not had an opportunity to interact on those. Indeed there was an initial review of Rev. 1. There was a supplemental review, and the Board

received just Friday what is referred to as the second supplemental review of the NIOSH site profile Rev. 1. And it's that document, second supplemental review Rev. 1, which Board members have received -- I believe there are copies available here for the public -- and this will be reviewed for us at this time by Dr. Makhijani. And then --

So on your agenda where it says Mallinckrodt site profile, it's really the review -- the supplemental review of that by our contractor, SC&A, as presented by Dr. Makhijani.

So Arjun, if you'll take the podium now, we'll be pleased to hear from you.

SUPPLEMENTAL REVIEW

DR. MAKHIJANI: Thank you, Dr. Ziemer. Yeah, I -- but we called the first one supplemental because the first review was really of Rev. 0 and then was supplemented by what we did on Rev. 1, and so this is the second round of that.

Last time our review was partial and preliminary, as we said, due to the very short time. And we've tried to complete it, so we addressed --

First of all, before I launch into this, I really want to give some thanks to some people. I came out here at the end of May -- near the end of May -- to talk to site experts and workers and -- and I really thank them all. Many showed up and I really want to thank Denise Brock for organizing that meeting. She put a lot of time to do that. And I also want to thank Kay Drey, who lives here in St. Louis and has a -- quite a large archive of documents and -- and she allowed me into her basement and -- and -- to look at the documents and that was very useful.

And I -- I really want to thank NIOSH. I know they have a lot on their plate and they're very pressured, and we have lots of questions. We had a meeting in Cincinnati and -- and it -- it really -- I'm grateful that they were as responsive -- a lot of the correspondence is -- is in the attachments.

The Board basically asked us to look at the questions of data and the usability of the site profile for the '49 to '57 period for the downtown site, and there were some incomplete items from the last time we looked at this. We

hadn't looked at the airport site, both for the '49-'57 period, and we hadn't looked at the decommissioning section that -- that NIOSH had added, so we did that.

As you all know, there was uranium processed there, ores of various kinds, and then some residue processing also occurred, and we tried to address all those issues. So this review really covers the -- both the downtown site and -- and the SLAPS -- the airport site -- St. Louis Airport Site, as it relates to processing at Mallinckrodt. And so that's the -- I think I've already covered this.

The other thing that we did here is we -- we did try to look more completely or -- or get a better sample of those five, six boxes and see what was in them that might not be reflected in the site profile. The -- the transcript of the Cincinnati meeting is -- is not yet available, but I presume it will be posted on -- on the OCAS web site when it is.

So the -- the main focus of my presentation is going to be on this '49-'57 period, and so let me just get on to that so there's some time for questions.

Our overall conclusion was -- as more fleshed out now -- is the same as it was before, that to do anything other than minimum doses for compensation, major modifications to the site profile will be necessary. Also the -- the revised site profile will then have to be converted into a set of recipes and procedures to enable the dose reconstructors to have sufficient guidance about a -- a quite complex operation to be able to actually reconstruct doses in a way that's scientifically defensible, and we tried to flesh out what that might mean.

The data and analysis in the TBD really -- so -- so -- they -- it -- the TBD is just a first starting point, and so there'll be more work that'll be necessary after the TBD's complete.

Our major con-- so there are three categories of doses that we've always talked about. There's the minimum dose, which we've dealt with already. There's the reasonable dose with claimant-favorable assumptions, and there's the maximum dose with scientifically reasonable worst-case assumptions.

Now I distinguish between the last two -- when

I think of reasonable dose with claimant-favorable assumptions, I think of a situation where, for instance, you have bioassay data for all the relevant radionuclides for which the worker was exposed, so if they were exposed to radium and thorium and neptunium and uranium, then you have radionuclide-specific data. You may have some gaps about solubility and particle size and so on which you fill in with claimant-favorable assumptions. But what -- what you have is really a measurement-based dose with some claimant-favorable assumptions. If you take that idea of reasonable dose with claimant-favorable assumptions, something that's quite accurate and leans toward the claimant, then we concluded that reasonable doses with claimant-favorable assumptions were not possible, that the dat-- the data along the lines that we were talking about is not there to sustain such a type of dose reconstruction. We listed a -- we list a number of items that will be necessary to fix, both in terms of data and analysis, and I'll go into them in some detail. That will be necessary if maximum dose constructions with scientifically defensible

worst-case assumptions are to be made. And I really want to stress the latter part of this because it's always possible to make worst-case assumptions that are subjective, that you can say well, it can't possibly be bigger than this. But I -- as -- as we look at the situation, the worst-case assumptions do have to have some scientific basis, and that's also how we read the regulations. And I'll come back to that at the end of my presentation because I think there are some quite difficult regulatory issues to be addressed in regard to maximum doses.

But first let me go to the technical issues. Why do we think that reasonable dose estimates are unlikely to be possible. Well, Mont Mason himself said that radon dose data are not sufficient except for minimum and maximum estimates. And it's not simply a question of the number of radon measurements that were taken. We all agree that there were thousands of radon measurements that were taken. It is that the radon exposures were primarily puff exposures. For instance, when the drums of ore were being opened, or when the drums of

residues were being opened and so on. And because they were puff exposures and we don't have -- we don't have the data from those puff exposures for the individual workers, you -- you can't make reasonable estimates and the type that I was talking about, but you could make bounding estimates by using distributions and 95 percentiles and so on, but you do have to collect all the data. We discuss that we feel that radon in many areas might be high enough to affect non-respiratory tract organs. The other part that -- that's unclear is what was the history of residue processing in Plant 6, and that's not very clear so it's not -- it'll not be possible, we think, with the existing data to make an accurate assumption about radionuclide ratios in the composition of the air. So some kind of -- if you can't find that history exactly and we -- we didn't see an indication that you could, then you'd have to make some kind of maximizing assumption about that. So a reasonable estimate is not possible -- no distribution, no -- no time period for processing.

Similarly we didn't find Mallinckrodt-based

measurement data for these other radionuclides. There's some data on radium 226. I believe it's actually one measurement that was taken in 1947, one set of measurements, and that measurement was not related to the period in which the re-extraction of uranium was done. But I did find, and I -- we agree with NIOSH that that was a good starting point and that 100 to one ratio for radium would be -- would be applicable for the later period for -- for ore proc-- ore processing and first -- first cycle K-65 residues.

We have no radionuclide-specific bioassay data for the most important radionuclides for a lot of workers -- thorium 230, radium 226, actinium 227 and protactinium 231. There may be a possible small exception -- I think there might be some thorium 230 bioassay data for -- for the thorium extraction in the '55-'57 period, but -- but I'm not sure about that.

There's insufficient information to develop accurate correction factors for Barnes Hospital urinalyses, 1949 and early 1950. We -- we do think that -- from the information available that Barnes Hospital analyses might have been

systematically underestimated. But the degree of underestimation would have been variable because of precipitation of uranium from the standard, and -- and it may be possible to develop a maximum correction factor. But accurate correction factors, it at least -- there didn't appear to be the base and data to -- to be able to do that. That applies just to a limited period of '49 and maybe early 1950. There are incomplete environmental release data. Now this was -- this is a new item. There are no environmental release data in the site profile. We found in the five, six boxes of consid-- that there was -- there's evidence of -- of large releases of uranium on a partial basis that's compiled. That -- that information is on -- on page 38 of -- of the report where I compile -- I simply compiled a table that was in the document cited there. And as you know, Plant 4 is not mentioned here. And in my experience, every single es-- estimate that has been done of environmental releases from nuclear weapons plants in modern times, including those sponsored by the CDC, has found the old estimates to be significant

underestimates. So I -- these values are not to be taken as accurate. It's just -- these values are to be taken as what was thought to be released at the time, and it would take a significant amount of work to actually develop environmental doses, and probably some maximizing assumption would have to be made. There's not enough data on incidents to be able to do accurate doses, we think, for -- for -- for rare incidents. For instance, there was spills from the digester tanks when there was a lot of foaming, and there was cleanup operations involved with those spills. They were very episodic, of course. For frequent -- for frequent events like blowouts that workers experienced, that would be a different matter and that can be done.

There's a lack of air monitoring data at the airport site. Mallinckrodt workers went there. There's a question of radionuclide ratios over there. And a lot of the wet residues dried out at the airport, so how -- some -- some kind of worst-case assumptions will need to be made there.

And we think that unmonitored workers were at

risk of significant exposure and they were quite -- the clerical workers were unmonitored, so some kind of maximizing assumptions will have to be made for that.

So to update the TBD for maximum dose -- possibly; we don't know whether it'll all hang together when it's done, but this is what we believe needs to be done to make that judgment -- incorporate all the available radon data, the residue composition, processing history and development of worst-case assumptions. And it may be that if -- if it can be tracked to Fernald, it might be simpler than -- than what I found, but I was not able to track it to Fernald. So the suitable radionuclide ratios need to be developed.

In this context I would like to say that -- that I might not have made it clear enough during the subcommittee meeting, but I don't think that the air concentrations can be used for -- for doing dose reconstructions, even if you had these radionuclide ratios. I think you do have to go back from the bioassay data and -- and use those because there's no -- there's no evidence that we've come across that the air

concentrations were actually measured when the residues were being processed. And I think because of the high concen-- high specific activity of these radionuclides and -- and in the residue, I -- I don't think there's any -- I -- at least I have not seen any analysis that would allow me to be comfortable that the air concentration data, in the absence -- that -- the air concentration data can be used for lots of things, but I don't believe they can be used for dose calculations for these radionuclides. I think you do have to develop ratios and go backwards from bioassay data, and you have to be comfortable that those ratios are -- are defensible.

You have to develop a correction factor for the Barnes Hospital data.

I think the thorium 230 urinalysis data do need to be located. I don't see how -- how these doses for the AM-7 residues processing can be done otherwise.

The air concentration measurements in -- in Table 22 of the site profile are not useful. They were not made during the production time. The multiplicative factor of three is -- is not

founded in any -- any data or any surrogate analog, and I don't think the air concentration data are going to be useful unless some -- some very close process someplace else can be found, and we haven't seen any evidence of that. So without bioassay data I think it'd be -- currently I don't know how -- how the thorium 230 doses could be reconstructed.

And I think a better -- better assumptions about airport site workers need to be developed for air concentrations. I'm not comfortable that -- that what's there in the site profile is -- is a good set of worst-case assumptions. For incidents that were frequent we had this -- we had a discussion as part of our June 1st and 2nd meetings. This did come up at the last Board meeting, how are blowouts and incidents going to be happened -- going to be taken into account. And when I came here to St. Louis it was again confirmed that -- that blowouts were very frequent, sometimes once a week, twice a week, once every two weeks. They varied according to plant and period because the metal production was shifted to a newer plant in -- around 1950. And -- but they were pretty

frequent relative to the bioassay frequency. And so long as they were once a week or once every two weeks, they -- the intakes would look more like routine intakes and -- and would be covered if a maximizing approach to analyzing bioassay data is used. That is, NIOSH has suggested -- I believe at the last meeting, or -- or on June 1st or 2nd, I don't remember when -- that if -- if the inferred air concentration envelopes all bioassay data, then for frequent incidents we would agree that this would be a reasonable approach.

I'm not sure -- we're not sure that this would cover infrequent incidents. For instance, there were dust bag ruptures and -- they were not as frequent, so far as I know. I -- I've not been able to establish any idea of the frequency; perhaps more interviews might be able to settle that. But we're not -- we're not comfortable, from what we've seen, that a defensible or worst-case approach has been demonstrated as yet for infrequent incidents. It can possibly be done, but it hasn't been demonstrated during our discussions.

Site expert and worker interview data will be

essential for infrequent incidents 'cause you first of all have to establish the types of incidents we're talking about, what the radionuclide -- this radionuclide ratio is going to appear in a variety of incarnations and situations because it will appear in the environmental data -- we've got environmental data for uranium. We don't know how much radium or thorium and so on is there with it. And it's going to have to be estimated because, from worker interviews, we know that the alleys had a lot of dust and, as you heard yesterday, tables in cafeterias and so on and -- and there's evidence that -- that this -- this problem will -- will occur in a number of guises, and a suitable set of assumptions needs to be developed.

In regard to incidents, I've said this last time, also, that survivor claimant dose reconstructions are going to pose more challenges if, as appears to be the case from the files at Mallinckrodt, that the incidents are not in -- in the file generally. Some incidents are in the file, but I think the incidents of the type that we're talking about

-- at least I -- I didn't see fully documented, so there -- there are serious data gaps in this regard.

We had -- and here I'm especially thankful to NIOSH and to -- for -- for actually doing these calculations. We -- we raised the question -- and -- and in the annex four of the report you can actually see the geometries that were studied on page 66 through 68 of the report. NIOSH studied three different geometries of -- of external dose exposure, location of the film badge, and -- and there's a little table of correction factors on page 64 of the report. And it seemed reasonably clear that correction factors will have to be developed by job type and by organ. Where the job type is specified to be a particular location for a given period of time -- and by the way, we agree with NIOSH that job type data are very good at Mallinckrodt generally, and they are available and they are in the worker files. And so this -- this data is available to be used. There are very few cases in which job type data are not available. And -- but correction factors will have to be specific to the source, the job

and the organ.
How the roving workers are going to be handled in this regard is going to be a special challenge. And in view of this, we've suggested that one -- or a short set of claimant-favorable or worst -- defensible worst-case correction factors might be developed. But it'll still be necessary to do quite a lot of work. These are very preliminary numbers, as we understand from NIOSH. They don't incorporate beta doses and they don't incorporate other complicating factors. They're not done with a -- with the assumption of a real-life dummy that has the characteristics of a human body.
The other TBD changes that are needed is worker monitoring history for Plant 1 and 2 decommissioning need to be established. Plant and 1 and 2 decommissioning was done in '49 and '50. There are no records for this decommissioning. It's not clear that the workers who did the decommissioning were monitored. If they were not -- if they were monitored there would not be a -- a difficulty here. But if they were not monitored, we don't

see that the kind of air concentration data that are available for production can be applied to decommissioning. So you know, we don't have an approach to suggest other than researching documents. A closeout survey was certainly done.

The -- for those workers for whom surrogate worker cohorts are needed, we don't know how many there are. Presumably there are few. The Tables 28 for internal dose deri-- for air intake are derived from bioassay and Table 33 for external dose need to be revised.

And then there are the usual set of revisions -- 95 percentile values for air concentrations if they're going to be used; oro-nasal breathing, which is an outstanding issue upon which we -- we don't have agreement yet, if I was to understand Dr. Neton's presentation from yesterday.

It's clear that the working hours per year in the site profile don't reflect the normal experience of workers. Workers normally worked six days a week. They were working overtime. There's very clear evidence that in peak periods workers even slept at the site in the

dispensary. Independently more than one worker said this. It is documented in attachment 6. I -- I think that the presence, the time of presence on site is a very critical factor. We cannot ignore the fact that workers were even sleeping there at the site in terms of -- now if you have bioassay data and so on, this is okay. But if -- if you don't have bioassay data, I think it -- it raises major questions about how -- how the -- the working hours default at least should take six days a week into account, and overtime was very, very common. And if it's not built into the site profile and the claimant is not -- and the employee is not alive, it -- it makes it -- it makes it very difficult 'cause you would normally go back to the default assumption, and I think the default assumption is not good enough.

We do think that breathing rates for heavy work periods should be incorporated; that the 1.2 cubic meters that's currently in the site profile doesn't reflect the variety of conditions and it should be adjusted for those periods.

One issue that did come up that I don't have in my slides, but it is in the report, is when I showed -- when we discussed the AEC time data for how long it took to do the bomb charging with workers -- I must say they all laughed when I -- when -- when they -- when they looked at -- they told me 30 minutes, of their own accord before I showed them the data. And then I showed them the data so I -- I didn't want them to be biased in any way by what was in the AEC records. When I showed them the AEC -- laughter was really the first and uniform response. I don't know how we're going -- I think the use of air concentration data is -- spent -- the time-weighted data is going to be very difficult.

Review of the boxes, boxes contained quite a bit of data. The external dose data, there's quite a bit of it that remains to be captured. It would be useful for worker cohort development as necessary for maximum dose type of things. It won't be useful for typical worker cohort development because in most cases the job locations are not identified. They are identified only for the most exposed workers,

and dose ranges are not uniform.
I've already mentioned the environmental releases. I think this is -- the importance of the environmental release point should not be underestimated in -- because people were moving back and forth between buildings, we don't know whether these were puff releases, we don't know the patterns of exposure, they -- this is -- this is a big new item that I just developed as I -- you know, discovered, rather, I should say -- as I was making a final check to see whether I'd covered my review of these boxes properly, and -- and I came upon this table which -- which I've reproduced for you. So -- so I think -- I think it's very important to understand that this is -- this is a new item that needs to be properly considered. And its implications for -- for unmonitored workers, including clerical workers, are at this time unknown. But the releases are large enough that they could be significant.
(Unintelligible) survey of the decommissioning, the type of file indicates that dose reconstruction currently stopping at '62, but I don't know how the workers are tagged in terms

of who were Mallinckrodt workers and when they are followed and how long they're followed, and I did not attempt to research this issue further. But -- but how long the dose reconstructions are carried out for Mallinckrodt workers and how long the residues in the airport site and the movement of the residues is taken into account is -- is kind of a -- somewhat unclear to me, but could be important for individual workers 'cause workers may have gone from Mallinckrodt to the contractors and then to the new contractors, and I'm not clear that -- that we can track them.

The good news on the decommissioning is that the -- the bioassay data seem to have been done well and in triplicate and there seems to have been some quality control for -- for the bioassay data, and it should be available for most workers.

A lot of the assumptions in the site profile regarding suspension and the indoor work year and so on seem to be claimant favorable.

There are some outstanding factors. There's the pesky issue of radionuclide ratios again;

the external exposure geometry issues may not be as complex, but we didn't see a discussion of that.

I'm not sure the SLAPS workers were -- were monitored. I didn't -- didn't see clear tracking of that.

I -- I do think that -- that we can't assume that the airport site's chemical composition and solubilities and so on were the same, because they dry out over there, they get oxidized, they -- they change chemically.

And ingestion -- when air concentration data are used for production times and no bioassay data, then of course ingestion has to be taken into account. We're still not comfortable with the way NIOSH is handling the ingestion question. It's not just a question of particles being deposited on surfaces from the air. There's -- there's large particle ingestion issues that are apart from the deposition out of the air onto surfaces that -- that need to be taken into account.

But overall, the -- the work remaining to be done on the decommissioning period seems to be possibly less than -- than in other cases,

especially if these radionuclide ratios are established.

The -- the big regulatory question that we came across is if in the absence -- our judgment is that -- that reasonable dose reconstructions will not -- are unlikely to be possible at Mallinckrodt, so only maximum doses will be possible, if they are possible. We can't make a judgment. If all -- quite a lot of work remains to be done, and at the end of it there will have to be a scientifically defensible set of assumptions for maximum dose calculation or maximum plausible dose calculation. And in that case, if an SEC petition is denied it will go back to 42 CFR 82. Currently 42 CFR 82 defines this efficiency method for dose calculation. I did -- we did review all the six cases that have been denied at Mallinckrodt. In a number of cases the internal doses that are being used are -- are not a scientifically defensible set of internal doses. They've used Technical Information Bulletin 2, which has radionuclides like plutonium and strontium and cesium, which were probably not present at all and, if present, in

extremely trace quantities. And it's not -- it's not defensible to use those kind of assumptions -- or not fair and not equitable. And if you use those assumptions for Mallinckrodt, then you can use any assumption -- then you can justify any -- any set of assumptions for any worker. And -- and that level of -- of -- that -- that departure from the basic history of the site as to what happened there seems -- seems not justified to us. And so the question is how are these maximum criteria going to be developed and are they going to be used for compensation as well as denial. And in that case is there one set of worst-case assumptions or are there two sets of worst-case assumptions. And then in that case, how do you define -- as we read 42 CFR 82, all -- in order to be fair, the worst-case assumptions do have to be scientifically reasonable. And if they're -- if they're -- if they are used for denial and compensation, then the question is what happens to all the cases in which worst-case assumptions have been used only for denial and POCs greater than 50 percent and then they are recalculated.

We don't have an answer to this, but this clearly seemed a very confusing and unclear thing to us that -- that we felt that we should point out to the Board, and this -- this elaborates what I have just told you and that gives you the team of -- of people who worked on it.

I'd be happy to take questions.

DR. ZIEMER: Thank you very much, Arjun. Let's begin with Dr. Roessler.

DR. ROESSLER: I have two questions. The first question is on this slide you mention the internal team reviewers. I don't see Joyce Lipsztein on there.

DR. MAKHIJANI: Yes, I think Joyce was very busy with other things. I did send things to Joyce and I don't think she fully -- she got a chance to get to them 'cause she was working on Y-12 and various other things. Mike Thorne is also a very good expert on internal dose issues, and I also used Bernd Franke, who also has experience in bioassay and internal dose. I did send all the materials to Joyce, but she --

DR. ROESSLER: Okay, but Joyce is still --

DR. MAKHIJANI: Oh, yes.

DR. ROESSLER: -- with -- with the team in some --

DR. MAKHIJANI: She's working on Y-12 -- if I'm right, Joe. Is Joe here? John, is that right? Yeah, I saw all the e-mail traffic so I'm -- I know that she was working on Y-12.

DR. ROESSLER: I think it's unfortunate she wasn't involved in this particular review.

DR. MAKHIJANI: Yes. Well, I did send her the materials for -- for review, but...

DR. ROESSLER: The other question I have is on slide 13, and in here you talked about the decommissioning, 1958 onward. I'm wondering what the pertinence of that is with regard to this petition, which ends with the 1957 period.

DR. MAKHIJANI: Well, the -- Dr. Roessler, the decommissioning does not have to do with the '49-'57 period. Since we were asked to do a site profile review, the last time we had said it was incomplete. We thought it proper not to have to go back again and say oh, it's still incomplete and we're going to do it next time. So we did put some effort, although not the major part of the effort, in doing this. It

doesn't have a direct relevance to --

DR. WADE: And for the record --

DR. MAKHIJANI: -- the main question before --

DR. WADE: -- SC&A's review is of the site profile.

DR. MAKHIJANI: So we didn't -- we didn't want to have to tell you that we haven't finished yet and we'd like more time, so we tried to finish everything.

DR. ZIEMER: Arjun, just for clarity, your sixth slide --

DR. MAKHIJANI: This goes backwards one at a time.

DR. ZIEMER: Well, it -- it's entitled "Bases for finding that reasonable dose estimates are --

DR. MAKHIJANI: Yes.

DR. ZIEMER: -- unlikely," which I -- I think one might take that to be kind of the bottom line. But then the following slides suggest a number of changes in the Technical Basis Document --

DR. MAKHIJANI: Yes.

DR. ZIEMER: -- that -- the implication is that if these changes were made, then reasonable

dose estimates perhaps could be made. Is that the position that SC&A is taking or --

DR. MAKHIJANI: No, I don't believe we took a contradictory position like that. I think -- I think there are some items there that -- that could be like in the -- fall in the category for that item of reasonable doses, but overall I think most of those items relate to the development of scientifically defensible worst-case assumptions for maximum doses. So when -- when you add up all the changes, we don't think -- we think there are a number of items that -- listed in that slide for which you cannot make reasonable dose estimates. So when you make all the changes and add it all up, you are going to -- you're going to have -- you're going to be in the territory, in our judgment, of -- of maximum dose estimates.

DR. ZIEMER: As opposed to reasonable.

DR. MAKHIJANI: Yes.

DR. ZIEMER: You're not ruling out the maximizing process.

DR. MAKHIJANI: Well, what we've said in regard to maximizing is, because the changes are so major and outstanding data questions are

significant, we -- and then it all has to be translated into do-- that we couldn't make a judgment whether at the end of the road you'd actually be able to --

DR. ZIEMER: Yes, understood.

DR. MAKHIJANI: -- do it.

DR. ZIEMER: Yes.

DR. MAKHIJANI: But this is the -- necessary, but whether it's sufficient or not, I don't know.

DR. ZIEMER: Yes, understood. Wanda?

MS. MUNN: Dr. Makhijani, could you characterize a little more clearly for us what is the issue with the Barnes data?

DR. MAKHIJANI: Yes. The -- we didn't find any evidence that the urine samples were contaminated and so on. The issue with the Barnes data was that the standard itself was deteriorating with time, and so the standard of -- comparison amount of uranium in the standard was decreasing because the uranium was getting precipitated out of the solution at the time of the comparison. And so there was a discussion and a number of tests and comparisons were done, which is in the February 2, 1950

document. That document was analyzed and a full analysis is presented in Attachment 7, Mike Thorne did that for us. And so far as we are able to tell, it appears that one of the systematic error -- one systematic error arose from the standard deteriorating, and that would have tended for samples to be overestimated, if there hadn't been another error. However, it appears when they did the independent tests, and this was the set number six -- I'll point you to the place in the discussion. If you go to the end of the report, on page 85 you'll see over there a test that was done on -- on this, and the Barnes data were actually systematic underestimates when tested by the New York Operations Office, not against the Barnes standard but against the New York Operations Office standard, which we presume was okay. It appears then that there were two competing errors, one arising out of -- we do not know what, maybe a calibration issue of the equipment or something that seemed to give approximately a 30 percent underestimate. And that was being offset over time by deterioration of the Barnes standard. At the

time a comparison was made, it -- you know, New York Operations and -- and Mallinckrodt were reading the same thing and it seemed like Mallinckrodt was making an overestimate compared to the standard, but the standard itself had deteriorated.

So there -- there appears to be some kind of an error in Barnes. We're not sure -- this is the best that we could tell from the data available.

DR. ZIEMER: Jim Neton, can you add to this?

DR. NETON: Yeah, I'd just like to add a little bit to that. I -- I've read the Mike Thorne analyses and I'm very familiar with the memos that are cited. I -- I think it was erroneously attributed to me in the review that I stated that the source of the high values was just contaminated samples. There is indication that there were contaminated samples. There's a memo to that effect. But we also discussed this possibility of the standard precipitating out of solution, which was well covered in that February 2nd memo.

And in fact, I think the competing interest or competing effect that is referred to here -- on

three occasions Mallinckrodt was called to Barnes Hospital. This was written up in the Mont Mason letter, and Mont Mason did a very nice evaluation of this. On three occasions they kept saying the instrument's losing sensitivity. In other words, they measure their same standard, and it would read low. Well, on three occasions they actually artificially boosted up the calibration curve so that they now read like they used to, artificially raising the efficiency. And I think on those three occasions that explains a lot of the discrepancies that Mike Thorne was observing. So I think it's not an unknown. I think it was well covered by Mont Mason, and so it does explain a lot of these differences. So I think that's what was going on. Standard's precipitating, artificially jacking the calibration curves back up to expectation rather than calibrating, and -- so I think it's something that we need to take into account, but I think the issue is well documented and well characterized.

DR. MAKHIJANI: Yeah -- yeah, I think the issue is documented. We've -- we've presented some

kind of a rough, sketchy analysis of it, not -- not -- and we haven't recommended a correction factor. But we think that there is some correction to be done and some looking into. They did try to develop a constant correction factor, and we think -- and this is -- this is discussed in the site profile as it currently stands, to some extent. And that -- so -- but it's not -- it's not clear that the Barnes Hospital data are systematic overestimates for all the data that were taken. And so a question of correction factors does arise.

DR. ZIEMER: Other comments or questions? If not, we'll continue with the presentation by Dr. Neton from NIOSH. And again, Board members, you should have a copy. And thank you, Arjun, for --

DR. MAKHIJANI: Yes.

DR. ZIEMER: -- your presentation to us. You should have a copy of Dr. Neton's overheads, as well.

MR. GIBSON: (Via telephone) Excuse me, Dr. Ziemer?

DR. ZIEMER: Yes, Mike, are you on the line?

MR. GIBSON: Yeah, I just wanted to let you

know that I -- I called in about an hour ago. I just didn't want to interrupt Dr. Armanjani (sic), but just to let you know that I am in participation now.

DR. ZIEMER: Very good, Mike, glad to have you aboard. I wonder, were we able to provide Mike with copies of these documents?

DR. WADE: Not to my knowledge. Do you have access to a FAX machine, Mike?

MR. GIBSON: No, I -- I have some of the preliminary stuff, the -- the PDF documents that were sent e-mail, but I don't -- I don't have the -- the rest of the stuff, no.

DR. ZIEMER: We'll try to get copies to you somehow today, Mike, so you have a hard copy of these presentations.

DR. MAKHIJANI: I could e-mail them from my room.

DR. ZIEMER: Would you like -- if you have access to e-mail, Dr. Makhijani can e-mail his overheads to you from his room here yet this morning.

MR. GIBSON: Yeah, yeah, I do have access to e-mail.

DR. ZIEMER: I think we have his e-mail in the

document, do we not, in the -- in the book? We'll get it to you.

UNIDENTIFIED: (Off microphone) I have -- I have his e-mail.

DR. ZIEMER: Okay. That will --

DR. WADE: Mike --

DR. ZIEMER: -- that will come to you shortly, Mike.

DR. WADE: Mike, are you --

MR. GIBSON: That'd be great. Thank you.

DR. WADE: Mike, are you able to hear the proceedings adequately?

MR. GIBSON: Yes. I mean there's a little cutting in and out, but I think I'm -- I'm hearing most all of it.

DR. ZIEMER: Thank you, Mike.

We'll -- we'll proceed with Dr. Neton's presentation, and at the break I think Dr. Makhijani will try to e-mail you this material.

MR. GIBSON: Okay. Thank you.

MALLINCKRODT SITE PROFILE

DR. NETON: Okay. Good morning again. I'm going to talk about Mallinckrodt and dose reconstructions in a couple of specific areas. I'm not here to necessarily rebut, point by

point, the SC&A review. I'm -- I'll certainly be happy to answer any questions that we're talking -- you know, and discuss that in the general context, but here I'm really to talk about two -- two issues, really.

At the last Board meeting there was this outstanding issue of integrity of the data and biasing of the data low and that sort of thing. So I'm here to present our analysis of the data and what we've found as to that issue. I think, to some extent, this has been mitigated. SC&A has also, I believe, agreed that their analysis has shown that there has been no obvious gross alterations of the datasets, but I'll go through these slides nonetheless just to show what we've done.

And secondly, I've added a slide because I sensed that the raffinate issue was going to loom large on the horizon, so I have a few slides just to go over the raffinate, to set the stage for maybe some discussion.

Before I proceed, though, I would like to credit -- SC&A has done a tremendous job in reviewing these profiles. As you can sense, they leave no stone unturned and they've done a

tremendous job in -- in reviewing the dataset, and I think this profile and our dose reconstruction process is much stronger for that. So I will give them a lot of credit.

Okay, moving forward, though, I would like to start and just outline the dose reconstruction process again because I think, in some sense, SC&A and NIOSH are a little bit -- coming at the approach from slightly different avenues.

There are a number of data elements that make up the site profile, or a number of data sources, and that's represented over here on the far left. The first thing we do is we go and collect Department of Energy data, to the extent possible -- what we've got as far as monitoring data, that sort of thing.

We have the claimant file where the claimants often put in information, in -- you know, annotations about incidents and such.

And then unique to Mallinckrodt, we have what's known here as the CER database, the Center for Epidemiologic Research database. That is an electronic database that has a pedigree. It was inherited from the Mancuso study way back in the late '70s, and was validated by ORISE at

that time, and we have the legacy database here, which is very helpful in performing these dose reconstructions. I'm going to talk to some extent about this piece.

But -- so we have -- we have the data. And then what happens to this data. This is where we start. Now we have site profiles, and in addition to site profiles we have procedures, implementation guides, Technical Information Bulletins, that sort of thing that help interpret all these sources of data, as well as the claimant interviews that help identify unique conditions. As Dr. Makhijani pointed out, this is most helpful and useful when we're interviewing claimants who are former workers and less help from survivors, but nonetheless, we have this avenue available to us.

All of this goes together under the -- under the review of an experienced dose reconstructor, we have minimum experience requirements, who assemble this and come up with the dose at the end of the day.

What I'd like to point out is the site profile is one piece of this. In -- in some sense, when you listen to these reviews -- and

justifiably so -- they -- they appear like they're stand-alone documents used in a vacuum. Where, as you'll see in my discussion, we have much, much information here that does not need to be relied on -- does not need to rely on the site profile to do an adequate job reconstructing doses.

So let me just talk a little bit about the sources of data. Again, the DOE responses are individual and summary film badge reports. We have gone out and asked the Department of Energy to give us all relevant information you have, including incidents, medical X-rays. We have tabulation of urinalysis results for claimants, these dust study cards that we discussed this morning -- individual cards that document by year an individual's work locations on a weekly basis. And then these McBee cards, which some of you may remember. Before the days of the computer, these cards that have little holes punched in the top and you -- you push in a rod and you can sort by different fields. This is what the original film badge data are on. And in fact we have a large number of workers with the cards with the

handwritten weekly doses entered onto them. The CER database, of course, is a compilation of all the data that was at the site, including much of the information that was -- was available at the Department of Energy. But I just want to give you a sense of the magnitude of the data that we have available that's already computerized.

We have over 9,000 of these air dust cards, representing 1,443 workers through 1955. After '55 these are less useful. They tended not to keep track of them as often because I think, as you'll see later, the air concentrations in the plant were decreasing rapidly, and I think they relied more on the urine monitoring program.

The database also contains 13,600 urine sample results, individual urine sample results, almost exclusively for uranium, although there are thorium measurements in there that we -- we have found.

There's also over 8,000 person-years of film badge results. That's 8,000 yearly values for workers at the site.

Importantly, there is about 4,700 area radon measurement results that we can rely on for

characterizing the radon in the work environment.

And something that hasn't been discussed so far is about 2,400 radon breath measurements. These are breath measurements that were made primarily by the Health and Safety Laboratory to help determine what the intake to radium was in these workers. We believe to some extent these can be used to help put upper bounds on the radium intake of workers at Mallinckrodt. The SC&A review has challenged the value of some of the early samples. The memos that they cite, to my knowledge, really refer to falsely high values because the radon in the room was -- was elevated, therefore leading to elevated radon breath measurements. So if anything, I think that these would tend to bias the results high. But these can be used and there's a large number of workers that were measured. And in fact, these can almost be used to help trace which workers were involved in processing raffinate because there's no reason to measure the radon in breath, which is an indirect measurement of radium intake, unless the worker was potentially exposed to that -- that waste

stream. So I think to a large extent we can use these to help bracket who was exposed to raffinate materials.

Now let's get back to the issue of data integrity. We have -- in going through the database, we have about 1,300 pages of original laboratory result sheets from the Health and Safety Laboratory. You might remember that that was the laboratory that had oversight of these AEC operations as far as health and safety goes, a very credible laboratory with a well-qualified staff. In looking at these sheets, there's about -- there are 14 entries available per form. Now not all forms are completely filled and we didn't go in and count every sheet. But if on average there's about 10 entries per form, which I think is probably not an overestimate, you end up roughly with about 13,000 urine sample results that are the original coded sheets that HASL sent to -- sent to Mallinckrodt.

Now I just want to point out that it's kind of suspicious that we have 13,600 urine sample results that were coded off the original workers' cards, and we have, by my estimation,

pretty close to that number of HASL urine sample data. Now I'm not going to suggest that's 100 percent, but I think what we've found -- and I'll talk about this later -- is virtually all of the uranium measurements after 1949 were done by the Health and Safety Laboratory by our own independent evaluation, which gave us a fairly good comfort level that the urine sample results can be relied on, to a large extent.

We also have these results of periodic dust studies that were conducted. There were campaigns on an annual basis to go characterize the work environment and dust at these various work locations, but also campaigns that would go and measure specific areas where there was concern. So between '49 I think and '57 there are -- I wrote this down -- 42 dust study reports. Those are individual reports that are each made up of hundred of individual -- individual air sample measurements. So you get the sense that at Mallinckrodt we have a large volume of data to start with.

Okay. Now lets get back again to this -- this integrity of the data issue. We approached

this from a multi-faceted viewpoint and so we tested in several different ways. We poked around and looked at the data to see if, you know, it walked right, smelled right, looked right, make sure the data appeared to be okay. So the first thing we did was we got together with ORISE and got their validation studies, what was their protocol that they used to accept the Mancuso data that was -- already had been coded in the '70s, was inherited from the University of Pittsburgh when they took over the studies. And they did a ten percent random sampling of the data against the original jacketed cards that they'd pull out of the medical records and validated that they believed that the data that were already coded were -- were acceptable. With the exception of the urine data, they felt the data could be relied on, to a large extent. They actually went back, though, and recoded all the urine data -- 100 percent recoding -- and so we have very good confidence in the urine data here, and also good documentation of the other data that they -- they accepted were valid.

So we went back and looked at the CER data and

went back and looked at some of the original data sources that -- that were available, such as the HASL data. We looked at the HASL data sheets and compared it with the results that were in there. And then we looked at the consistency of the fit in the CER data with typical occupational exposure data, did this data look about -- look right; from a person who's done a lot of occupational data and looking at literature values, do these have the right characteristics of what you'd expect. Then finally we went back and looked at some of these intakes and, using the values in the profile, estimated what the intakes -- compared the intakes estimated using the air concentration data and the intakes one would expect using the air data.

I will be the first one to admit that this has a lot -- there's a lot of uncertainty in the intakes based on urine data. Those who have worked with any bioassay data recognize that there's large uncertainties. What we were really looking for here is, again, is there any gross deviation from what's expected, and we'll see what happened.

And then finally we went back and said okay, if these data do appear to be okay, what is the extent of the data available for the active cases. Do we actually have real data for people, or do we have to have surrogate data for 90 percent of the workers.

Okay, I'll just -- I have a few of these slides, and they're quite colorful and pretty, but I think the most important thing to note is the nice linearity of these -- these graphs. The red line represents the dust concentration in dpm per cubic meter -- that's on the left axis -- and the urine concentration data is on the right side -- is on the right axis. And you can see that these things -- these fit straight lines on a log probability plot very well. And what's interesting is they tend to be parallel, which is kind of interesting. You'd expect the urine sample to somewhat parallel the air sample data if the concentrations did indeed go up and down concomitantly.

So I have slides here for 1949. We see no perturbation there. That looks very consistent with -- with our evaluation of standard data;

1950, similar. There is some trend here toward divergence here, but nonetheless these R-squared values are really good.

Now this is interesting. I spoke about this earlier at the working group meeting. This is a good example of what happens when you've got some -- when you have some censored data. The dust concentration data here was entered right out of the CER database and plotted on a log probability plot, and you see here that there's this extreme down-turn right around 30 percent. And I mentioned this morning -- for those of you who weren't here, I'll repeat it -- that it turns out that the dust concentration data in 1952 and onward were not computed on the individual sheets. I'm not saying that they don't exist. The sheets are there. I've looked at some of the original sheets. They've entered -- remember I said they kept track of where the workers were by week in individual years? They never bothered to go back and calculate the dust concen-- add in the dust concentration data for those jobs, for whatever reason. When ORAU coded this, they put in zero to hold the place as a missing value, and this

is what happened. And I've confirmed this with Betsy Ellis, who reviewed this dataset, and this is exactly what happened. So this is somewhat of a fortuitous example of what can happen when you do have data that are censored, and we were able to figure out what -- what hap-- what went on.

Okay. Interestingly, we just plotted here the mean -- the median value of the urines over time with its fifth and 95th percentile values, just to show that there is a consistent down-turn in the urine monitoring data over time, and a fairly consistent spread of the data. So this is essentially a replot of all the data that I just showed you on one slide.

Now this probably won't be tremendously readable. I got this right out of an AEC report, but my intent here is to show that the down-turn in the urine data -- this is on a log scale -- is very consistent with what the AEC is reporting based on their analyses and different engineering controls that were put in place over time. This line right here represents the average air concentration -- and this is for Plant 6, I believe -- yes. The

average air concentration in Plant 6, starting in 1949 and continuing on through the 1950s, and a tremendous drop here in around 1949 through -- between 1949 and '50, indicating that a lot of these work practices were put in place, work practice and work controls. And that's very consistent with what we see in the urine data. This value here, you might wonder, is the maximum values that were measured, and this is the average values.

Okay. We did the same thing -- I'm not going to present you a litany of the external data, but suffice it to say that the external data fit very nicely the same way, and we saw no evidence of -- of a fudging of the datas, and I'm just going to show 1949 and 1957, and you'll have to trust me on this; I can produce the graphs if you'd like, but they're all very boring and fairly straight, like this.

Okay. Let's get on to the -- so we -- we've got the feel that the data do not look askew, and the last test that we did was we looked and said okay, let's compare the air dust data -- which are the red dots -- against the urine data for a subset of the workers. So in this

particular case we're talking -- we're looking at the ether house, which is -- remember we talked earlier in the day about the ether house being the extraction area where the raffinate was already -- the radium was removed and here they're trying to get more pure uranium.

So here are the points representing the median value of four workers' urine who had fairly complete monitoring over time. I believe actually there -- there was four here and -- and another set here, but nonetheless there were four workers with fairly complete urine monitoring data. And I indicated here the fifth and 95th percentile air bars, assuming a GSD of three, which is very consistent with what we use in our site profile -- in our dose reconstructions. It's well-established that there's a number of reasons why urine data has uncertainty. Partly it has to do with what we talked about yesterday, the breathing rate; part of it has to do with the particle size; a lot of it has to do with the individual metabolism of the workers. So I just wanted to show that there is uncertainty here and that the -- the red squares, which are the air dust

data, I think I can say are not inconsistent with the urine data.

Now again, the uncertainties are large, but there's no gross indication that these data were -- for example, if the urine data were all down in here, I'd start to worry a little bit that maybe they were under-reporting the urine data.

But I've just done this for a few plants. This is Plant 6 where there's no -- no radium source term.

Now if you look at -- this is a cloth operator, and I think SC&A has this same analysis. It's not graphically presented in their report, but the same -- I think they've done the same comparison. I was actually encouraged to see we got the same -- pretty much the same numbers.

What you see here is interesting that in the earlier days you see a higher value for the uranium dust -- the dust data, decreasing down over time, and still not inconsistent with the -- with the bioassay data here. But what seems to be happening here is you have a radium source term. The ether -- the cloth operators

are the people who were working with the radium product that was precipitated out. And one can envision that as the pitchblende ore concentration started decreasing in quantity of -- of raf-- of radium, you started more approaching a value that was closer to the -- to this situation. So I thought that was kind of an interesting indication that where you have -- in fact, if you look at the ratio of this to this, it's almost like around 100 to one, which I think is extremely fortuitous, but nonetheless interesting. Again, all of the values are within the air bars.

Similar analysis here not quite as good agreement. Again, this is real data, warts and all. But again not inconsistent data for a pot room operator. These are people working with the -- the purified form of the uranium in the pots in Plant 6. Higher here, but it's still in the same general vicinity is all I'm trying to point out.

This is an interesting operation here. I'm not exactly -- I can't explain this away, other than -- I thought about this point a long time. It's high. You would -- it's encouraging that

it's high, not low, but at the same time, this -- we modeled these as Class W materials, and it's quite possible -- in the packaging operations sometimes workers were handling UO-2, which is Type S material. One would expect less in the urine than what we're seeing for W, so maybe that explains it. But this is the only slide where I felt there was some issue, but again, I'm encouraged that the value is -- is higher for the -- you know, it's -- it's easier to consider why that value is high rather than extremely low.

So again, I'm not saying that this is -- validates it completely, but if you -- if taken collectively, you know, the -- the lognormal fit of the data, the not inconsistent agreement with the urine and the air data, one has a sense -- and I think SC&A agrees -- that there's -- the integrity of the data is -- is not really an issue.

Let's talk a little bit about the percentage of the workers monitored here. I've got a graph here, and I think Larry Elliott has a slide that shows actual numbers, but this is a graphic representation by year of what we

believe to be the percentage of workers that were actually monitored with these types of -- of measurement techniques. You can see the breath radon was a small subset of the workers, but about 15 to 20 percent over time, terminating in '55. This may actually be the affected population of raffinate workers. There may be more than that, but certainly these would represent the more heavily exposed workers. You would be taking breath radon measurements on the more heavily exposed worker, and -- and we know -- we know who these people are. I mean we actually have their -- their job cards and everything.

Followed by the urinalyses, starting at about -- less than 60 percent in '48 and increasing over time to where you have about 80 percent of the workers monitored through '55, and a slight down-turn here after '56 when production operations started to -- to decline. I think '57/'58 was pretty much agreed that that was the end of the production operation for -- for the Mallinckrodt facilities.

Air dust, we have a similar pattern, for the most part, of 50 percent -- not quite as many

here in '50, but then increasing rapidly to 80-plus percent '51 and '52. Now I have to explain, the red -- the red bar is the air dust cards that we actually have the time-weighted average values filled in. I've indicated here on this graph the air dust card we have for workers after '52, which give us information about job location but have not necessarily been finalized to the -- to the time-weighted average value, but we could go back and reconstruct that ourselves.

And film badge data, we have a very consistent percentage, 75-80, up to almost 100 percent of the workers monitored in the later years. So again, we have a lot of data on these workers. This is projected based on the total population that worked on the uranium project at the -- at the -- at Mallinckrodt.

Okay. So that -- that's our projection, based on what we know to be the work -- you know, the number of workers we have data for versus the number of workers we believe to actually be working at the Mallinckrodt facility.

Now we went back and looked at records available for claims that we have. Right now

we have 109 cases in our possession who have employment start dates between 1949 and '57. Now these are people who are not in -- as part of the SEC. I mean they started after 1948. And we went back and looked at a number of these individually.

First we went back and looked at job title work category information, and we at least have some information on what these people did for 98 percent of these 109 cases. There's something in their file that tells us what they did. I think there's only two people out of these 109 where it says unknown, and one of -- I've looked at both of those and it's -- it's an interesting -- it does not appear to be -- they do not appear to be workers who had a high potential for exposure, let's put it that way. The DOE response and CER files were reviewed. We looked at -- do we have -- what -- do we have any urine data and film badge data for these 109 workers, and we went back and looked at every single one, and we found that we have -- for about -- almost 80 percent of the cases, we have some urine data and film -- some film badge data. I'm not saying we have complete

monitoring records for all 78 percent for every year, but there is some indication of what their magnitude of their exposure was for -- based on urine and film. That's a pretty -- pretty large percentage of the work force. It's interesting -- these are -- these are not necessarily the same workers. For example, in some cases you may have urine and no film and some film and no urine, but it came out about the same. You have -- still about 78 percent of the workers have some data.

Now of -- I mentioned about 12 percent we don't have bioassay data. I thought it would be of interest to just sort of catalog the workers where we don't have bioassay data, and many of these make sense -- clerk/typist, secretary, foreman possibly. Some of these, though, I -- were surprising. But then I started looking at these, and some of these -- subcontractor at the kiln, maintenance welder -- these are -- research chemists -- these people started later in the Mallinckrodt years at Destrehan Street. And in fact, if you go back and look at their Weldon Spring files, you'll find some urine data. So overall, the percentage is even

higher than 78 percent if you start incorporating urine data that you have from the time they went to Weldon Springs. And of course those can be used, to a limited extent, to go backwards in time and figure out some bounding estimate based on that.

Okay. All right. Another thing we did when we looked at the Center for Epidemiologic Research data versus the Health and Safety Laboratory sheets, we went back -- and remember, there's 1,300 of these sheets and they were somewhat arranged chronologically, but not perfectly, which kind of made the effort a little more labor-intensive. But we went and looked at 20 percent of those 109 cases that we -- we have. And we compared the data that was in the CER database to the actual coded sheet on the Laboratory analysis result. And we found that 98 percent of all the bioassay results were found in the HASL laboratory sheets. In other words, 98 percent of the results for those -- those 20 percent of the workers were HASL laboratory results. I think there was only a couple that weren't -- three I think weren't found. Two of those were in the 1949 time

frame, which were more than likely done by Barnes Hospital, interestingly weren't in the database at all. And another one -- it appears to be a duplicate where the CER database had two samples one day apart with the same value, and it appears to be just a -- a clerical entry error.

So we had very good comfort that the data that we're working with these claimants -- these cases are -- are HASL urine data. 94 percent of the data that we found exact -- exactly matched what was in the CER database against the HASL.

Like any database, we did discover some errors in transcription of dates, the dates were off. Reading numbers that are handwritten oftentimes you'll see a four transcribed as a nine, that sort of thing. Those are the type of errors that we -- we found in here. We do believe that the errors were reflective of data on the Mallinckrodt cards and not the CER data, although we've -- we've looked at this in a couple of cases, it seems to match, but we're not saying that it was always the case. But nonetheless, this gives us a pretty good

picture that the CER database for the urine are pretty usable for dose reconstructions.

Okay. I've gone through this and I don't want to belabor the point, but you know, to summarize what we've done with this characterization work, large percentage of workers monitored. Almost everybody we have some job information about job title or category.

The distributions of the data are very consistent with what we've seen ourselves in NIOSH and other research studies. No evidence of alteration. The decrease is consistent with what we've seen from the AEC reports.

The intakes and -- based on urine and air are not inconsistent with expectations given -- even given their large uncertainty term.

And the urine samples in the CER database agree very well with the original HASL reports.

So -- so that -- given that volume of information, I think we -- we've got a pretty good picture of how to proceed with dose reconstructions. And remember, where we have the original data we have to rely less and less on the site profile to make up these -- you

know, to use these surrogate worker distributions that we talked about.

Now I just want to finish up with a couple of slides on raffinate. Again, raffinate is a term used to define residues created from the refinement of ore. The chemical process creates a disequilibrium, so it's well known that this disequilibrium is most important for the daughter-- radium-226, actinium-227, thorium-230 and protactinium-231.

I think this is a fairly instructive slide. This is an AEC report when -- this is a simplistic view of it, there is more going on here, but just so we know where the waste streams come off -- as we talked about this morning, this lead sulfate cake is really the K-65 cake. This is where radium -- sulfate, lead sulfate were precipitated, so this is where you take out all of your radium. This was a refinement process here where they just wanted to remove the excess sulfate. There is some radium in here, but most of the radium -- as far as I understand the chemistry -- stays up in this lead sulfate cake.

We talked a little about this morning -- in

1949 they started to add a step here where they would take this cake and wash it with sodium carbonate -- both of these processes were washed with sodium carbonate, with the intent of removing additional uranium, to improve the recovery of the uranium. That's a little different than reprocessing all the way from the beginning like we talked about. I mean this is not a full reprocessing with digestion and everything. This is just taking the cake and essentially washing it and taking out more uranium.

Once you get down to the diethyl ether extraction process, there were occasions where there'd be a precipitate. This would include some junk that they needed to filter off. This was filtered off using the Sperry ca-- Sperry press, thereby the name Sperry cake. This Sperry cake was what was used and sent to Mound, 20 tons, to obtain protactinium-231. As we mentioned, two grams of protactinium-231 were extracted from 20 tons of this material, so we have an idea what was in this junk as far as protactinium.

And then, after going through the whole process

and liming it, the aqueous phase is dumped in the river, and then you have the airport cake which ended up being a huge pile of stuff, 25 feet high, covering -- I don't know -- acres over at the St. Louis airport site. This was just essentially dumped on the ground, is the way I understand, reading it. This material was drummed, being essen-- originally it was the property of the Belgian Congo government, I believe. This was -- this was preserved more in drums, but this was just left on the ground. So we do acknowledge that there are disequilibria in each of these things. We do believe that there are techniques that can be used, even including taking this material and running it back through to extract more uranium. We can account for the disequilibrium using either urine and/or air sample data and use default assumptions that -- that bound the exposures for the workers.

I think with that -- I have just one more slide here, but that's essentially what I just said. We can use default ratios for thorium and radium exposures. If we -- if we do it both ways, if we base it on a urine result and we

use a air sample result, we're going to pick the higher of the two and assign the dose to the worker, so that -- that's our approach for dealing with the raffinate issue.

I think with that, that's all I have to say. I guess I'd be happy to discuss this if there's any questions.

DR. ZIEMER: Okay. Thanks, Jim. Dr. Roessler has a question.

DR. ROESSLER: My question has to do with the radon breath analysis, which has nothing to do with radon in the environment. It's an indication of how much radium is in the body and comes out in the breath. I think that should be clarified.

But you -- you indicated that this -- looking at those measurements -- on certain individuals would be an indication of how you could look at the ones who might have been exposed to raffinate. And I'm wondering if you're making that assumption based on the fact that these people might have been expected to be exposed to radium -- but did they know back then about the raffinate?

DR. NETON: Oh, yeah, I think that's why they

took the radon breath analyses, they were --
DR. ROESSLER: Okay, there's indication --
DR. NETON: -- they were concerned about the radium. Oh, sure.
DR. ROESSLER: But -- radium, but what about the protactinium and thorium and the other ones that have been brought up as radionuclides of concern?
DR. NETON: I believe they were -- they were aware of the waste stream. But as has been pointed out, very little bioassay were done for -- particularly the Sperry cake operators. There are thorium-230 samples in the database. Now the thorium-230 process actually took the residue, ran it through -- it was a wet process, by the way, and when it was shipped to Mound it was liquid, and so it -- with the exception of dumping this into the digesters, it's a wet process the entire way. There were bioassay monitoring taken for thorium-230 for those workers, and it was a limited campaign. It was a -- it was a one-shot deal to extract that thorium and send it to Mound, so we have some confidence and there's some indication from interviews with Mont Mason that ORISE did

back in 1980 that it was a limited campaign. It took place in Plant 7E, we know the facility. So we do have some ability to bracket the time and the facility where these occurred.

DR. ROESSLER: So are you also saying that -- that because they took these measurements on a limited number of individuals that that helps define the --

DR. NETON: Well --

DR. ROESSLER: -- raffinate problem or --

DR. NETON: -- I think so. I think it's a safe assumption to bet that if you were monitored for radon in breath, there was some potential for you to exposed to raffinate. We would be hard pressed not to assume that the person was at least involved in the raffinate -- transportation, processing, handling -- in some way. I mean it doesn't make sense that they would take a subset of workers and measure them for radon in breath without there being some -- in fact, there are lists that I've gone through that talk about who's being added to the list and who's being taken off and that sort of thing. And there's clearly, in my mind, a

decision process to -- to cover these workers who were exposed to radium, at least. But they -- they won't be informative at all about thorium-230 or that sort of thing, but at least as far as people who were exposed in the process stream. Whether we would end up defaulting to a protactinium exposure or actinium, thorium or thorium-230 exposure is something that we would determine on a case-by-case basis.

For example, if we knew the person was a digester and we knew that they're working the digester before any re-extraction had gone through, it would be a pretty safe bet to assume a one to one equilibrium of radium to uranium.

DR. ZIEMER: Dr. Anderson.

DR. ANDERSON: Yeah, I was -- I was just wondering, it -- it -- a lot of this sounds very reasonable and -- and the decision to who to do breath analysis on, but is there any documentation describing that that -- you know, do we have something more than the assumption that if you're going to do it, you would do these workers because they're exposed to radium

rather than it's our -- we're just interested in what the radium exposures in the work force would be. I mean that would be another way to look at it, and --

DR. NETON: Yeah --

DR. ANDERSON: I mean you would think that there -- these would have a sampling strategy -- I'm sure they had it at some time. The question is was it ever written down.

DR. NETON: Right. I'm not aware of any at this point. But I don't want to imply that we would only assume those people were radium -- or raffinate workers. I was just trying to indicate that that would be a good starting point to say well, certainly these people have potential. Now let's go and look at, for instance, the film badge results. If you recall, radium has a huge photon emission from the daughters. So people with extremely low film badge results are very unlikely to have worked with significant quantities of radium. But if you -- on the other hand, if you have very large film badge results -- and believe me, they are high film badge results in the early Mallinckrodt years -- that's an excellent

indication that you're working with radium, or around radium material. So that's another indication.

Then you couple that with job and -- and those type of issues --

DR. ANDERSON: Yeah.

DR. NETON: -- you should be able -- we should be able to get a fairly good feel. And of course where there's doubt, we're going to err on the side of the claimant on this issue.

DR. ANDERSON: My -- my other question was -- very interested in the 109 individual -- I mean part of it is can it be done technically, and I think you're showing that it can. The question is how practical and feasible to do all of these combinations and cross-checking as -- as how many of people who filed claims during this period actually have -- have had the dose reconstruction done, not just the efficiency process. I mean you're saying -- you haven't been waiting for the site profiles in order to complete these, so have any of them actually -- you have a lot of individual data. How many have actually gone through the full evaluation and have done -- that have reconstructors

actually done what you're describing, cross-referencing all of these various -- I mean it's a fascinating process to be able to do. It also sounds very time-intensive, so I --

DR. NETON: It is. These are 109 what we would call active cases, meaning they still need to have dose reconstructions completed. I think -- and I don't have this number exactly, but I want to say that we've done 30 or so dose reconstructions thus far at Mallinckrodt, maybe 36 -- Arjun may know better than I do at this point -- but most of those were compensable, and most of those were lung cancers because, as you can see, the source term here lends itself to very large lung doses.

DR. ANDERSON: Yeah.

DR. NETON: The radon component, the uranium, the radium. In fact, I think one of them were compensable based on an actinium-227 dose calculation. I think there were five or six that were non-compensable that Dr. Makhijani spoke to, and we did use these over-estimating -- what we would call a deliberate overestimate approach. We would say we don't know exactly what happened, but it's certainly less than X,

based on our -- our knowledge of what's going on. And I -- I recognize there's some issues. When you start adding radionuclides that weren't present at the site, it stretches -- stretches the credibility issue a little. So we've done some of those.

I don't know that we've done any what we would call complete dose reconstructions for any of these workers thus far.

DR. ANDERSON: It just becomes kind of a practical issue. Given the workload that's there to be done, the amount of effort one has to put into a relatively small number of cases here, an efficiency issue would be something to look at.

DR. NETON: Right, yeah, I don't want to imply that we're going to do full, complete refined dose reconstructions. I think in many cases the maximum assignments -- maximum credible assignments -- plausible assignments, not using these -- these overestimating things -- will end up possibly, for systemic cancers, being -- you know, using the efficiency process and demonstrating that it's less than 50 percent. It's the -- it could work either way.

Although, on the other hand, for some of these raffinate workers where one cannot do a refinement other than a maximum credible dose, it's possible that many of those cancers would be -- would be compensable.

DR. ANDERSON: But up to this point, after this amount of time, we haven't really done any of those so you --

DR. NETON: No.

DR. ANDERSON: I mean it's feasible, you're saying, to do, but it hasn't actually occurred yet.

DR. NETON: That's correct.

DR. ZIEMER: Roy DeHart.

DR. DEHART: But we've heard concern on the part of the petitioners that they're -- they were not getting information at the time they were employed, and I assume that much -- this data was identifying the individual by badge number or name. Do you know whether reports were rendered -- I realize this was an early time -- back to the employee?

DR. NETON: I do not. That doesn't mean that it wasn't.

DR. DEHART: Okay. Thank you.

DR. ZIEMER: Other questions for Jim Neton? If not, we're going to take a break at this time. Thank you, Jim. And we'll --

MR. GIBSON: Dr. Ziemer?

DR. ZIEMER: Yes, Mike.

MR. GIBSON: Could I make a comment?

DR. ZIEMER: Oh, yes, you certainly can. Didn't mean to ignore you, Mike. Go ahead.

MR. GIBSON: I'm sorry, I guess you didn't see my card.

DR. ZIEMER: Out of sight, out of mind, Mike, yeah.

MR. GIBSON: You know, with respect to the quantity of data, and I know I've in some ways raised the hackles of some of my colleagues before and I didn't intend to do that -- you know, a couple of years ago Secretary -- then-Secretary Richardson said we have not adequately monitored these workers. So with respect of the quantity of the data -- and let's assume for the moment that the quality of the data is correct -- you know, the Board was made up intentionally of medical professionals, health physics professionals and labor, and I think that was for a reason. Because there are

those of us who have been in the field and ac-- for decades and actually seen what went on, and it's the -- sometimes the way people are monitored, number one.

For instance, were air samples taking at the breathing zone where the work was going on, or were air samples taken where the monitor sat over in the corner of a room, which is not going to give you an adequate representation. Were air monitors set up up-stream or down-stream of the air flow if you're working outside. So irregardless (sic) of the quantity of the data you have available for you -- and again, let's assume that the data that was analyzed by the professionals is correct -- to me -- I've seen instances where it's still not -- the monitoring that may or may not have taken place is still not representative of the exact position of the workers, irregardless (sic) of if it was taken in the same building, the same room, it still wasn't -- not necessarily put in a position to where it truly indicates what the workers may have been exposed to.

DR. ZIEMER: Okay. Yes, thanks, Mike. Good

point.

MR. GIBSON: And as far as default assumptions, you know, I am not a professional, but the default assumptions they take when they have personal bioassay data and the like -- even if you take the worst-case assumptions for those default factors, those default factors are not always necessarily the correct factors to be taken into consideration.

In mean, for instance, a lot of bioassay samples -- I know at Mound the default factor was 45 days from your last bioassay test. It may have happened the day after your last bioassay test, which may have been 90 or 180 days ago. Another default factor is they assumed 33 percent weekly, 33 percent slow, 33 percent, you know, yearly type solubility classes of the -- of the material. So even if you take that worst-case assumption, that's still the worst case of the default factor they use, in my opinion, and not necessarily the worst case of what it may have been. So I -- you know, I just wanted to --

DR. ZIEMER: Yeah, thank you -- thank you for making those points, Mike.

Other comments? Yes, Mark Griffon.

MR. GRIFFON: Just -- just a quick follow-up on that. I think one thing that I -- I -- I wanted to re-emphasize maybe that Jim mentioned was that in the cases where they're back-calculating intakes, they're going to look at the air sampling data along with urinalysis data and -- and it's at least somewhat reassuring to me that -- that most of these people have urinalysis data. I -- I have some questions on the air sampling data, also -- the representativeness of it. It was -- it was studies and I think later they assigned some of those job values to individuals, so it's not really -- when you look at the CER data, it's my understanding is that even though it looks like you sort by individuals and you have data there for them, those data were actually averages from a prior study on that certain job title, if I'm understanding this correctly. But -- but notwithstanding any of that, it's reassuring that -- you back-calculate intakes two ways, using urine data and using the air -- and forward calculate it using the air sampling data, and they -- NIOSH is committing here, I

think, to saying we're going to take the worst-case value of either one of those and carry it forward with -- to -- to calculate the appropriate doses. So I think that -- that's one somewhat reassuring statement.

DR. ZIEMER: Any other comments before we take our break?

Okay, we'll take about a 15-minute break and then we'll reconvene. Thank you very much.

(Whereupon, a recess was taken from 10:50 a.m. to 11:15 a.m.)

DR. ZIEMER: We're ready to reconvene this session, ask everyone to take their seats. Dr. Wade has a couple of comments as we get underway again.

MALLINCKRODT SEC PETITION

DR. WADE: Just as we begin an SEC discussion, I -- I'd remind you of several things we've talked about before. What'll happen this afternoon now -- this morning and continue this afternoon is that you'll be presented with an SEC petition evaluation report by NIOSH. We'll hear from petitioners as to that report. The Board'll then deliberate and make a recommendation. That recommendation will go to

the NIOSH Director, who will form a decision package that will go to the Secretary.

I've said this to you before and I'll say it to you again. I think it's terribly important that you create a record that strongly supports the package that you send forward. It is this record, as well as the recommendation, that will go to the NIOSH Director and form the basis of the decision package that goes forward. So I -- I stress again, make sure that everything you feel pertinent to your recommendation is contained in the record and will support the recommendation that goes forward. Thank you.

DR. ZIEMER: Thank you, and I want to also check and see if Mike is still on the line. Mike, are you with us still?

MR. GIBSON: Yes, still here.

DR. ZIEMER: Thank you. Then we are going to proceed with the Mallinckrodt SEC petition evaluation by Larry Elliott.

MR. ELLIOTT: Thank you, Dr. Ziemer, and good morning again, members of the Board and the public. I won't go through some of the slides you've seen before. In this particular

presentation, as I did yesterday, I truncated the presentation because I feel the Board already knows its responsibilities under the 83 rule that we have and you're following those, so I just keep my comments specific to the evaluation of the Mallinckrodt SEC petition at hand.

I would remind the audience and the Board that there is a two-pronged test that must be met, according to the statute. This test consists of, one, is it feasible to estimate the level of radiation doses of individual members of the class with sufficient accuracy. And I'd call your attention to the rule again on what sufficient accuracy means in this regard, and that is whether or not we can estimate the dose with a maximum bounding dose or a more precise dose estimate.

Secondly in the test, is there a reasonable likelihood that such radiation dose may have endangered the dose of members of the class.

If you answer no to the first part of the test, then you have to answer the second part of the -- of the test.

Our evaluation process of this petition, as

with all petitions, includes examining all the available data and information that has been obtained through the site profile development and all the other tools that are related to the particular site in question, as well as looking at dose reconstructions that have been completed to date and the petition information that was submitted by the petitioners. In that we are to determine the completeness of the data search and examine the quality as well as the quantity of the data and the information that we find.

The petition at hand was submitted to NIOSH on July 21st of 2004. The initial class definition was all employees that worked at the uranium division at the Mallinckrodt Destrehan Street facility in St. Louis, Missouri from 1942 through 1957.

The petition was qualified for evaluation on November 24, 2004. And as you know, we work diligently with the petitioners to make sure that a full basis of information is provided with the petition for examination, and that's part of this qualification effort.

The petitioners were notified and a *Federal*

Register notice was provided regarding the qualification of the petition, and that was -- both of those were done on December 20th of 2004.

NIOSH evaluated the petition and submitted a summary of findings and petition evaluation report to the Board and the petitioners on February 2nd, 2005. A summary of the evaluation report finding was published in the *Federal Register* on February 3rd of 2005.

On February 8th, 2005 we presented the evaluation reports and proposed class definitions to the Board. Those class definitions consist -- were -- there were three class definitions and they consisted of the following: One, all DOE, DOE contractors or subcontractors employed by the uranium division of Mallinckrodt during the period from 1942 through 1945; secondly, all DOE, DOE contractors or subcontractors who worked at the uranium division at the Mallinckrodt Destrehan Street facility during the period of 1946 through 1948; and the third class, all DOE, DOE contractors or subcontractors who worked at uranium division of the Mallinckrodt Destrehan

Street facility during the period from 1949 through 1957.

In that evaluation discussion of the SEC petition at hand in February, additional issues were identified by this Board and NIOSH responded to those issues in a supplemental report. The Board sent a recommendation to the Secretary of Health and Human Services on March 11th, 2005 and in that recommendation you asked that a SEC designation for all DOE contractors or subcontractors or Atomic Weapons Employees who worked at the uranium division at Mallinckrodt Destrehan Street facility during the period from 1942 through 1948, the first two classes that we identified for you, be added to the Special Exposure Cohort.

The Board reserved judgment, as you recall, for workers employed during the period of 1949 through 1957 until NIOSH had completed its supplemental report on that time period and answered some of the questions the Board had raised.

Meanwhile, as we were working on those issues, the Director of NIOSH sent a recommended decision to the Secretary of Health and Human

Services on April 6th, 2005 that was consistent with the Board's recommendation to add a class of workers for the time period of -- up to 1948.

The Secretary of Health and Human Services sent his decision to Congress on April 11th, 2005 to add the uranium division employees at the Mallinckrodt Destrehan Street facility for the period of 1942 through 1948 to the Special Exposure Cohort.

Now on April 27th, 2005 NIOSH presented its supplemental report to the Board. At that time the Board requested verification of data and examples of dose reconstructions using actual data, and Dr. Neton has presented that to you today. The Board also at that time reserved judgment pending that information from NIOSH for workers employed during the period 1949 through 1957.

Beginning in 1949 Mallinckrodt established an operational program of radiation monitoring of employees and work areas. This monitoring was conducted by -- with the oversight by the Atomic Energy's Commission on Health and Safety Laboratory, or HASL. And notwithstanding the

data reliability concerns that have been raised or were raised for the early period, NIOSH believes that there is sufficient information from the various monitoring activities, together with the information on radiological sources and processes, to reconstruct and validate the dose estimates for the period of 1949 through 1957.

In the SEC petition evaluation report 00012-2, Section 7.3 on items two, three and four, you'll find reference to this table and the following table that I'll present. But item two raised issues about breath radon and questioned the limited number of data and the use of zeroes in that data. I think Dr. Neton has presented to you today a solution to that by using urinalysis results to cure that data -- data gap.

On item three, the purportedly lost medical records, NIOSH has searched all documents and we have not found any indication that medical records were lost, and so the loss is not confirmed as of this date.

Item number four regarded altered records and a conscious cover-up, referencing a 1949 dust

evaluation which was never finalized -- a dust study which was never finalized. Our solution for this particular data gap would be the availability of data from a fully operation program from 1949 to 1957 that had the oversight of the AEC HASL laboratory and the ability to cross-reference data streams and validate the data sources, as Dr. Neton has portrayed for you earlier this morning.

In these two slides and in Dr. Neton's presentation we have presented to you that a large percentage of the workers were monitored and tracked by not only job title but also job category. There are considerable data and -- and distributions of urine, dust and external data that are consistent with occupational exposure datasets. Dr. Neton talked about lognormally distributed data as we would expect it to be; that he identified no evidence of significant alteration on either the low or the high ends of those distributions of data; and that the decrease in urine monitoring results over time were consistent with the reduction in the source terms due to improvements in engineering controls.

We also pointed out that the comparison of intakes from urine and air sampling data are consistent with our expectations. It was made clear I think that the urine sample data in the CER database agrees very well with the original HASL data, and we have made a commitment that we would use -- with regard to urine or air data -- whichever would be the highest and most claimant-favorable dataset for use in dose reconstruction.

In summary, for the years 1949 to 1957 NIOSH finds that radiation dose estimates can be reconstructed and validated for compensation purposes for this particular class. So we find that it is feasible to do dose reconstruction and therefore, while we believe that health was endangered here, we don't have to answer that particular prong of the two-part question.

And that concludes my brief presentation on this evaluation report. You've heard this three times and I welcome any questions you have at this point.

BOARD DISCUSSION, MALLINCKRODT SEC PETITION

DR. ZIEMER: Thank you very much, Larry. We will open the floor for questions from the

Board members, if you have any at this time. Dr. Melius.

DR. MELIUS: Yeah, Larry, in your presentation -- sorry.

In your presentation, under petition overview, you referred to follow-up to the April 27th Board meeting, said the Board requested verification of data, and I think -- believe that's what Jim presented. And you also say -- says examples of dose reconstructions using actual data. Now what -- what are you referring to there that Jim has presented --

MR. ELLIOTT: Jim did not present any of those. We felt that the data that -- that this presentation that he gave gave you insight into the various data streams. I'll let Jim answer the rest of it.

DR. NETON: Actually I think the dose reconstructions using real data were the intake calculations that we -- we presented that were based on real -- real data, compared to the intake estimates using the air concentration data. So if you recall like the ether plant or ether room, they were like N equals three or four --

DR. MELIUS: No, I gue-- I just --
MR. ELLIOTT: They weren't actual dose reconstructions, but they were --
DR. NETON: No, they were examples --
MR. ELLIOTT: -- how we use the data in dose reconstruction.
DR. MELIUS: They're one component of a possible dose reconstruction. I just --
DR. NETON: Right.
DR. MELIUS: -- think that's sort of mischaracterizing them to say that they're --
DR. NETON: Okay.
DR. MELIUS: -- examples of that and --
MR. ELLIOTT: That's what the Board asked for in February -- or in Cedar Rapids, and we didn't go to that extreme, you're right.
DR. MELIUS: Well, I wouldn't -- since I was the one that requested it, I would disagree with you calling that extreme. I think you're basically saying you didn't do it and that's -- let's leave it at that 'cause I -- I -- I have some issues with that, but we can talk more about that later.
DR. ZIEMER: Okay. Other comments or questions from -- from the Board members. I'm sorry,

just the Board members, yeah.

Okay, then -- oh, Henry, yes.

DR. ANDERSON: Yeah, I'm -- I'm just interested in the existing claims that have been filed. What -- what proportion of those -- or how many individuals would fit into this?

DR. ZIEMER: You're talking about the Mallinckrodt claims that have been filed to date?

DR. ANDERSON: Yeah, we heard earlier about 109 that are currently open. I guess I just want to have a sense of -- of what's currently in the queue, what number of individuals would potentially then fall under this process versus the dose reconstruction process that we heard that none of the cases to date have actually gone through the dose reconstruction, although we heard that, you know, there's a lot of data that individually that's there and you haven't been waiting on the site profile, so the backlog on these is -- they just haven't been done.

MR. ELLIOTT: I think if you look in your booklets under Program -- Program Status Reports, you'll find a summary there that's

provided by our communications development team on the number of cases. It's after my presentation, if my presentation's inside your book. It's -- I don't believe it's going to break it out the way you want it, Dr. Anderson. It talks about how many cases exist at Destrehan Street in our -- in our holdings. I think there are around 300-some. At the other end of the spectrum, how many of those have been completed and sent on to the Department of Labor, I believe that number is 75. The 109 cases that Jim was talking about are active cases in -- in the process. We can't -- I don't have a ready number for you to tell you how many cases would be affected for this time period because these cases, as you know, are individualized and some of them have time across time periods.

DR. ANDERSON: Yeah.

MR. ELLIOTT: I don't have that number. We can probably get it for you today, but --

DR. ANDERSON: Yeah, I mean --

MR. ELLIOTT: -- I don't have it at my disposal right now.

DR. ANDERSON: I mean some of these individuals

would -- would qualify under the earlier time period issue --

MR. ELLIOTT: Yes, that's true.

DR. ANDERSON: -- so I -- you know, yesterday we talked about the small group of people when we expanded the -- the Iowa by --

DR. ZIEMER: Perhaps Jim Neton can add some light here.

DR. NETON: Yes, I think there's some confusion here. The 109 active cases we -- we have in our possession worked in the 1949 to '57 time period, so those -- those 100 percent fall under this evaluation report right now. Now there are an additional 50 or 60 cases that have employment that spill over into this time period that are also members of the original SEC class.

DR. ANDERSON: That's -- that's -- yeah.

DR. NETON: That's your question, possibly --

DR. ANDERSON: Yeah.

DR. NETON: -- and -- and I don't know how many of those are SEC versus --

DR. ANDERSON: Yeah.

DR. NETON: -- you know, non--

MR. ELLIOTT: We'd have to look at those on an

individual case basis is the point I was trying to make --

DR. NETON: Yeah.

MR. ELLIOTT: -- and determine how much time they had in each time era.

DR. NETON: But my point was, the 109 I spoke about have no employment in the SEC classes that have already been awarded.

MR. ELLIOTT: Your question, Dr. Anderson --

DR. ANDERSON: Yeah, that's --

MR. ELLIOTT: -- was how many had a foot in both.

DR. ANDERSON: Yeah, I mean it's kind of what's --

DR. ZIEMER: Yeah.

DR. ANDERSON: -- what is the impact and how -- how much time is expected to do these dose -- dose reconstru-- I mean to me the issue is one of feasibility, I think. There's a lot of data available and we've heard kind of theoretical ways to go about doing it, but up to this point it really hasn't jelled yet into having been applied, and -- and is it totally feasible to do this? I mean it could be done, but we haven't seen it's actually been done and I want

to know how many of those potentially are out there because if there's 109 or so that's, you know, one-third of one month's evaluation review and so maybe those could get done pretty quickly.

DR. ZIEMER: Thank you. Other comments? Dr. Melius.

DR. MELIUS: Just a question and then a comment, just make sure I understand what's on the record from NIOSH. The only thing new on the record from NIOSH for this meeting is really Jim's presentation.

MR. ELLIOTT: That's correct.

DR. MELIUS: Relevant to Mallinckrodt.

MR. ELLIOTT: That's correct. We did not change the evaluation report --

DR. MELIUS: Okay.

MR. ELLIOTT: -- the 02 -- the 2 or the supplement to that.

DR. MELIUS: Okay. And then my comments, back to what Henry was just asking about and to my earlier comment, the question also is the question is of feasibility and what -- I thought we as a Board had requested last time was some evidence of feasibility by looking at

example cases -- do that. And instead what we got was examples of -- rather than example cases, we've had parts of dose reconstructions and -- and issues of feasibility related to -- to those. And -- and I think those are --

DR. NETON: I think that --

DR. MELIUS: -- somewhat different.

DR. ZIEMER: Jim.

DR. NETON: That wasn't my understanding. I presented, if you recall, last time a graph that had parallel lines that showed intakes based on urine data and intakes based on air data, and that was a hypothetical slide. And I believe what -- what we were asked to do was to go back and -- and not use hypothetical data to present those slides, but to actually fill them in with three or four or so examples using real data, which is what we've done. So I reproduced essentially the graphs I presented in Cedar Rapids, using real data as opposed to hypothetical data. And I'm sorry if I misunderstood the intent, but that's what I believe we were asked to do.

DR. MELIUS: Well --

DR. ZIEMER: Thank you for that clarification.

DR. MELIUS: Just for the record is -- I had a subsequent question with -- conversation with Larry trying -- making sure -- - clarifying at least what I meant and what I think the Board meant, and I think enough said on that, but I think it is -- puts us in a sort of a difficult position 'cause we still really haven't evaluated full feasibility on a number of example cases, and I -- I think -- makes our decision-making here much more difficult.

DR. ZIEMER: Okay. Thank you. Other comments?

MALLINCKRODT SEC PETITION

If there's no other comments, then we want to hear from the petitioners, and let me begin by introducing Denise Brock and -- on behalf of the petitioners. And Denise, if you'll take the floor, and any others you want to have speak to the petition, as well.

MS. BROCK: I'd first like to say hello to everybody. And you'd think I'd be used to this by now, as many times as I've done it, but my hands actually sweat. I had to get Larry to get me some water. Thank you, Larry.

And again, hello. I would like to thank everyone for coming today, and I would like to

second Senator Bond's welcome yesterday to all of you again today. I feel very blessed that St. Louis is once again the meeting place for this petition. And I would also like to offer my thanks to members of the Advisory Board, Senator Bond and Talent, all the members of the Congressional delegation, as well as NIOSH, Department of Labor, ORAU and SC&A staff. I thank you to all the claimants and members of the public who are here today.

I actually had a quote that I had gotten from a book -- Robert Oppenheimer -- but this was just brought to my attention by someone in the audience who is a former Mallinckrodt worker and he actually wrote this himself. His name is Sonny Schwenisen*, and I quote, (reading) With our hearts and hands we helped this nation through a dark and difficult time. We now ask the nation to show us their heart and help us. One year ago I filed a petition for Special Exposure Cohort status for the Mallinckrodt workers from 1942 until 1957. At that time a site profile of Rev. 0 was being used to do dose reconstructions. In February of this year, during your last visit here, NIOSH

decided to split my cohort. Thankfully you voted to give the workers SEC status from 1942 until 1948. This decision gave many workers and/or their surviving family members a feeling of closure, a feeling of justice being served. I commend you for this decision and I ask you to give the remaining workers at this site the same designation. I want to thank you for your diligence, as well as your patience in hearing my repetitive comments and pleas.

I believe that during the February meeting the site profile for Mallinckrodt Rev. 0 was undergoing a revision, and Rev. 1 was underway. SC&A had not yet been given an opportunity to start their audit on this revision. As you will remember, decision on the remaining years of my petition were tabled due to some newly-found boxes of data and a so-called Mont Mason memo. NIOSH felt that this information, along with the revised site profile and their view that AEC oversight gave way to more credible assay, was enough to do an accurate dose reconstruction on the remaining years.

NIOSH was given time to further their research on the Mallinckrodt datas, and SC&A was

reviewing the newly-revised site profile. As you already know and as I've previously stated, the boxes and the memo turned out to be very different than what NIOSH had originally claimed. The Mason memo raised many questions as to who actually authored the memos and only seemed to strengthen my case.

In Iowa during the month of April I came before this Board again to plead my case. Due to the unforeseen problems with the IAAP, SC&A was unable at the time to complete the review of Rev. 1 for Mallinckrodt. The Board voted to direct SC&A to finish this review and take it up at this meeting.

Now I've recently learned that on June 1st and 2nd there was a meeting between SC&A, NIOSH and the Board, and I'm really perplexed as to why this happens the way it does. As a petitioner I feel that I should have been alerted to that meeting, either via e-mail, phone call, mail, something, and I should have been privy to that meeting. I don't know that these are closed or -- or private. Even if they're not open to the public, I think as a petitioner I was put at a distinct disadvantage again not being able to

hear the findings or whatever had went on, and I wasn't able to even take a look at SC&A's findings. Most of the Board I believe got that on Friday. I just got that about a day ago, so that puts me at a disadvantage again.

And I understand that as a result of this and as part of comment resolution, NIOSH was given a list of corrective actions. I don't know that that's been completed.

SC&A was to complete findings on whether or not it was feasible to estimate dose. Based on the findings of this audit of Rev. 1, it does not appear that it provides a basis to do dose reconstruction with sufficient accuracy.

The radon portion of this TBD is still not complete, although SC&A has noted that it may be possible to do this at a later date.

However, there are aspects of this site profile for which data does not exist. For example, there is no isotopic-specific assay which would allow NIOSH to verify raffinate dose in the same way there is data to verify uranium.

Frankly, this is the core issue which has got to be addressed. And so far what NIOSH has produced is a set of ratios between the

concentrations of the raffinate and uranium which they assert can be used to estimate dose. This is based on one day of isotopic air sampling at Mallinckrodt.

As the SC&A audit points out, there is significant uncertainty, if not doubt, about the 100 to one activity ratio. On page 27 of the audit report, and I quote, (reading) Much more research is needed to determine the radon-226 to the U-238 ratio of the residues that resulted from reprocessing.

And again on page 20-- end quote, I'm sorry. And on page 28 I quote, (reading) Expected ratio would be in the range between 100 to 1,000. End quote.

Further on, three other radionuclides were not, it appears, taken into account in NIOSH's 100 to one activity ratio -- thorium-230, protactinium-231 and actinium-227.

On May 23rd and 24th, 2005 Arjun Makhijani of SC&A met with a series of former Mallinckrodt workers and conducted interviews. During this interview one of the many extensive discussions was in reference to time and task, and I think Arjun mentioned this earlier. For example, the

AEC estimated that one job in particular took 6.5 minutes, and as Arjun said, the workers got quite a chuckle out of that. Everyone there present rejected these findings and estimated the job to be at least 30 minutes or longer. Well, I have a few of these workers here today who you will hear give expert testimony as to the multitude of explosions, blowouts, spills. You'll hear about excessive dust, mist, vapors, et cetera from the raffinates.

As SC&A previously noted in its review of Rev. 0, even one more rem of the Sperry cake per month over a few years has a potential for significant internal dose. This raffinate, and I've stated this before but for the record, this raffinate was dewatered in a Sperry press and contained actinium-227, protactinium-231, thorium-230, as well as radium. These raffinates were acidic and neutralized with lime and a cake was created. This mixture could create an exothermic reaction. Durations of raffinate exposures are not well quantified. More significantly, NIOSH has been unable to identify which workers were exposed in Plant 6. Does NIOSH have a scientifically sound basis

for determining who was or was not exposed in Plant 6? The answer is no, and this is why Congress created the SEC.

I would now like to read and quote from notes taken during the interview process with Arjun Makhijani and some of the site experts. On page 6, digester process for ore and raffinates, in the mid-1950s the ore drums were handled by a mechanical arm that would empty them into a large digester tank. The personnel were separated from the tank by a glass wall. This was after the process had been automated and manual shoveling of the ore and raffinates into the digester tank was no longer carried out. The acid in the tank would foam. Sometimes the tank would overflow.

A similar process was used for thorium ionium extraction. The response to the question "Was it normal for stuff to boil over" from a site expert who worked in the area for about six months during the thorium-230 extraction period in 1955 to 1956 was, and I quote, (reading) Oh, yes, there were all kinds of messes there, end quote.

This problem extended to thorium-230

extraction. Site expert: They were trying to recover ionium out of the raffinate. The raffinate was on the alkaline side. It would foam and boil. It would go on the floor.

One severe accident required the hospitalization of a worker from the burns that resulted from liquid spilling all over his body. By the way, that worker is here today, scars and all. It is unclear how many workers were involved in the clean-up process, and how long that lasted. It involved hosing down the area.

Workers were also lowered into these tanks to clean them out. When they were lowered in, someone -- or, I'm sorry. When they lowered someone in, they had to have a mask and someone at the top with a lifeline. However, there may have been more manual handle of the raffinates at the airport. I quote, (reading) The stuff would be scooped into drums at the airport and would come into a conveyer. The (unintelligible) would come onto a conveyer belt and it was behind the glass screen and the mechanical arm would grab it, manipulated by an operator, and pour the (unintelligible) into

the vat and then it would start foaming, end quote.

Arjun Makhijani asked, "Were there fine particles of acid in the air?" Site expert: The main project was the big 10,000 gallon tank. (Unintelligible) agitator filled up the tank with nitric acid and it would be heated up and there would be 100 drums of uranium ore emptied into it. Each drum would be cut into the -- cut in the hallway. You'd take the lid off, wear your respirator. You'd sample the drum and put the sample in a jar. The lid was put back in. The drum was rolled onto a platform press and the button -- I'm sorry -- platform press the button and it would go up and grab the hydraulic arm, and you would push buttons and it would empty the drum into the tank. You'd reach in and take the lid off. It was the -- well, it was on rollers and the drum was washed with water spray, and you'd keep adding to the drums. We had ore from all over the United States, some from Africa. The fast-reacting drums would be added and then it would be the slower-reacting ones that would be added. Sometimes there would just be fumes,

and sometimes there would be red-hot nitric acid fumes all over the plant.

Arjun asked, "How often did that happen?" Site expert said the operation was round the clock. It happened at least once a week, at the minimum, probably more. It was round the clock so hard -- so that it's hard for me to say because he was not on all shifts. It was all out of operation and the foreman would have to get out the air hoses and thin -- and thin it would -- oh, I'm sorry -- and then it would -- and then it would get back to work. I would breathe a lot of nitric acid fumes. I don't know if there was uranium dust in the fumes or not, but there could have been. Then it was pumped out into the ether area where they extracted uranium.

The other thing I wanted to mention, I found this interesting, too -- a site expert said sometimes a skip hoist would fail and the drum would come crashing down. Those drums were 800 or 900 pounds, and they would spill all the stuff and it would get all around the rollers. There would be ore on the limit switches, and maintenance workers would have to clean it up.

That's just part of the wonderful -- wonderful interview that Arjun did with the -- the workers. They -- they did a wonderful job. You will also hear from one of the many survivor claimants. As Arjun mentioned, the insurmountable hurdles that these family members must go through to even complete a phone interview, so I do have someone here today to speak on that.

In the task three report, page 212 of 260 under 5.7, summary and conclusions, it states that based on procedures under review the adequacy of the interview process is adversely affect -- affected and compromised when the claimant is a family member. It goes on to state, and I quote, (reading) Lastly, the potential problems in the interview process as an integral part of the dose reconstruction process, especially for a family member claimant, are complicated by the current absence of a published procedure that specifically addresses the closing interview and the failure to involve the claim's dose reconstructor or a qualified health physicist in the closing interview in real time, end quote.

On pages 213 and 214 of the task three report, under 5.8, there are nine suggestions for improvement on this process. I do not know if these have been completed yet.

I would like to restate for the record what Congress directed NIOSH to do with respect to Special Exposure Cohorts. In the FY 2005 Omnibus Appropriations Conference Report, I quote, (reading) Radiation exposure, the committee strongly encourages NIOSH to expedite decisions on petitions filed under the procedure for designating classes of employees as members of Special Exposure Cohorts, 42 CFR Part 83. It was Congress's intent in passing the EEOICPA of 2000 to provide for timely, uniform and adequate compensation for employees made ill from exposure to radiation, beryllium and silica while employed at DOE nuclear facilities or while employed at beryllium vendors and atomic weapons facilities. The committee urges the Department to recognize that in situations where records documenting internal or external radiation doses received by workers at the specific facility are of poor quality or do not exist, the workers should be

promptly placed in a Special Exposure Cohort, end quote.

NIOSH believes that it is feasible to estimate dose on the Mallinckrodt workers 1949 to 1957. I would like the Board to consider that the concept of feasibility goes beyond the scientific, technical ability to reconstruct a radiation dose.

Senator Jeff (unintelligible) in an October 12, 2004 statement involving enactment of this law stated that, and I quote, (reading) And feasibility could entail the lack of relevant radiation dose records, that the records are missing altogether, that it would be prohibitively expensive to reconstruct dose, or it might take so long that the workers would have died by the time the job was completed, end quote.

Congress did not limit feasibility to only technical, scientific issues.

The first Mallinckrodt site profile was complete in October of 2002. It is now going on its third version, and it has been a year since I filed my SEC petition. NIOSH has not completed (unintelligible) contractor, and

although I appreciate -- and I do -- NIOSH's diligence in trying to correct these problems, it is time to honor Congressional intent. As Senator Bond noted, the site profile may be a living document, but when do we decide that enough time has passed? Do we allow the very claimants that this law was enacted for to die while waiting for NIOSH to have revision after revision.

Workers and claimants alike are dying. Every meeting that I have pled my case for this group of ailing workers I have been at a distinct advantage (sic), everything from surprise material and documents to reports that I haven't been given an opportunity to review. This meeting was no different, and I'm referring to the Cincinnati meeting and seeing all the reports.

There is no procedure in place to give assistance to petitioners by an independent source. There is no procedure to notify the petitioner when there is other meetings relevant to what they have petitioned for. But the Advisory Board is here to say when enough is enough.

Mallinckrodt workers from 1949 to 1957 deserve equity. Congressional intent demands justice for this set of workers. I am beseeching you, begging you as Senator Bond did, to add this class of workers to the Special Exposure Cohort. SC&A has stated that (unintelligible) finding reasonable dose estimates are unlikely. And I had noticed, too, when Dr. Neton was here he talked about job categories without bioassay. I understand that maybe certain things would not have bioassay because maybe the secretaries weren't badged or clerical people weren't badged. But it looked to me as though there were some things in there such as chemical operators and maintenance men and different things, and I found that perplexing that there was no bioassay on those people or there was bioassay missing.

There are numerous discrepancies and problems with this current TBD. Time, you know, again, to revise this. It's -- it's time that claimants do not have. And to the extent, however, that you are unable to determine that the entire group should have inclusion, I would urge you to consider a sub-cohort of these

workers who had potential exposure to raffinates, who were employed in Plant 6, and a group on page 29 of 86 on the SC&A report. This case has been made that the raffinate-exposed work force, for which there is no isotopic-specific bioassay, limited air monitoring and no means for verification of the potential exposure.

Again, feasibility has to do with time, as well. It has been a year -- almost a year since I filed this petition. Every day these workers are dying, and not just the workers, the claimants. This is an excruciating process, and -- and not just for us. I know it is for the Board. I know it is for NIOSH. I know that NIOSH does the best they can do. But there has to be somewhere -- somewhere to draw this line.

I agree with what -- what Wanda said. We're in the same place here. That's my struggle, too. We were in the same place in Iowa, and this is a living document. There's always going to be some new box or some new information that's going to come forward. But these workers do not have the luxury of time. They are dying

and the longer they live, the more cancers they end up with. They're suffering. They could use help with their medical bills.

Congressional intent was not to drag this on. It was not, and I urge you, I beg you to please give them the justice that they deserve.

I thank you for your time. I know you have a hard decision in front of you and I respect each and every one of you. I appreciate all you've done. I appreciate NIOSH having so many meetings in St. Louis for me.

I do have several workers that I would like to make some statements, and I've asked them to please try to keep it to about three minutes because I know everybody would probably like to break for lunch. The first person that I would like to call up is a wonderful former worker named George Blue*. George actually worked in the raffinate house and had a terrible, terrible accident, so I'll stand up here in case George needs any help, and then I will call the next one. And thank you again.

DR. ZIEMER: Thank you, Denise. And if George prefers to speak from there, that will be fine, too.

MR. BLUE: Do I have to come over there?
DR. ZIEMER: Either -- your choice, whatever you would prefer.
MR. BLUE: There's something I'd forgotten to mention earlier. It was related to the digest tanks where the -- occasionally the big mass of red fumes would -- would spew out of the tank, and the company kept two or three guys constantly crawling up in the I-beams washing off dust so when the fumes boiled down it took a lot of dust -- uranium dust in the air.
I think what Denise wanted me to talk about mostly is the experience I had at the raffinate tank where we were dissolving the raffinate in -- in an acid to extract an element out of it. And my job, after the raffinate was dumped in a small tank and digested in acid and fumed over and boiled back and sumped back, and when it was sent to my tank it was supposed to be stabilized. And then I would heat it up to about -- I think it was 190 degrees, and then sample it and maybe it needs more acid. Anyway, as I was agitating and bringing up the temperature, I seen this starting to react, foam up, and I shut -- tried to shut the steam

off and ran down the steps. And before I got hardly any ways it came over and it covered about 80 percent of my body. I peeled off all except my left arm and left leg, and I got scars on various part of my body from it and I spent about eight days in the -- Barnes Hospital and then a few days after -- after I got back, they called me to work and said I wouldn't have to do anything. But the foreman wanted me to start cleaning up and the -- I -- I did start and then I got real weak and -- and they sent me home. I don't -- I don't remember how, but anyway, after a few more days I went back to work. They told me that getting sick had nothing to do with the accident. The accident stopped whenever I came back to work, so I always kind of appreciated that, but I didn't -- you want me to talk about opening and sampling drums more or...

MS. BROCK: About the urinalysis, they only did one at the hospital. They had to catheterize you and you never had any more urinalysis after that.

MR. BLUE: No, I -- yeah, they kept wanting me to urinate when I was in the hospital and I

wasn't able to and they had to catheterize me and got a sample, but I never heard of anything. And working with raffinate, I always figured it was just dust and mud and stuff. I never heard radon mentioned one time, and I thought it was -- I knew it had a little bit of uranium left in it after refining, but...

MS. BROCK: Tell them about how it just filled the room with smoke. Remember when you talked about that going all over (unintelligible) everything was going all over?

MR. BLUE: Yeah, yeah. When one of those big tanks would boil over, the smoke and dust and fumes would spread through the building. You want me to mention about the -- that tank that exploded?

MS. BROCK: Sure.

MR. BLUE: Yeah, they -- they had a large tank where all the floor sweepings and -- and hosing down and everything went in this tank and they boiled that down and then send that to refinery and digest. And one night -- luckily the operator was -- was on break, but the tank exploded and blew a big hole in the roof and concrete block wall had a big hole in it, and

they was -- (unintelligible) lot of places with holes in it where acid ate -- ate through the concrete and...

The -- the sampling of the drums -- there'd be about 100 drums put in the digest tank and the drums were put down on a open hallway and you'd take the lid off with a respirator, which wasn't a very good respirator, but -- then sample each drum. And it -- that could have been in front of a hood or some place where -- you know, we didn't consider radon gas or anything like that, it just -- you know, just something you -- you never -- you weren't informed about or aware of, but I think I went over my three minutes, though.

DR. ZIEMER: Thank you. Denise, you have others I think that you want to have join you there, too, and please, go ahead.

MS. BROCK: Next I have Anthony Windisch.

MR. WINDISCH: Good afternoon. My name is Anthony Windisch. I worked at the Mallinckrodt Destrehan uranium plant in St. Louis from 1945 to 1957, and I worked at the Weldon Springs plant from 1958 to 1967. At a previous meeting of the Advisory Board I testified that I am a

certified computer professional. I started working with computers at the Weldon Springs plant in 1962. I testified that the Mason memo shows how most of the recently-found computer keypunch cards and other radiation records was a bunch of garbage and useless.

In May I attended a meeting with your audit investigator. I testified that as an electrician at the Mallinckrodt uranium plant I had witnessed and/or experienced production mishaps at almost every processing step during the production of uranium metal. For example, I worked to help clean up the contaminated electrical equipment after the ether house fire -- explosion; I'm sorry, not a fire, explosion. And I often worked to repair the large electric furnaces that were damaged because of the misfiring of uranium processing bombs.

The processing bomb was placed into a large electric furnace and heated to about 1,200 degrees. After some time, the bomb would implode with a chemical reaction where the pure uranium metal would settle down into the smaller, lower section of the bomb and form a uranium metal billet or biscuit that was about

15 inches in diameter and about six inches thick.

These processing bombs would often explode. The uranium and other metal -- materials would burn through the liner and through the one-inch-thick steel shell, spitting out uranium and other contaminants that would wreck the inside of the electric furnace. Chemical operators, electricians and others had the dusty and radioactive hazardous job of repairing the furnace. During one period of time these bomb explosions occurred once a week, sometimes every other day.

In my employment records I understand there is an employee suggestion verifying that because of the frequent bomb explosions there was a shortage of pre-cast ceramic tile, and I had recommended that more readily available fire brick should be used to repair the electric furnaces.

In 1962 when I was promoted to the job of computer programmer and analyst, one of my first jobs as a programmer/analyst was to review and analyze requirements, design and program computer programs and write computer

programs to produce a monthly badge exposure report. My monthly badge exposure report for each processing department listed each employee, with weekly badge readings and a calculated average daily badge film exposure. The department average daily badge exposure was also reported.

As an analyst I needed to understand what I was working with, and I review this with you. The worker film badge did not measure the amount of radiation activity. It was simply a Kodak picture film that recorded or measured the level of radiation. It did not record the amount. A high level of the badge exposure alerted the safety department to reconstruct what is now called a work site dose reconstruction profile, where they would actually go out to that worker's work site with a Geiger counter and air sampling devices and try to project a measure of radiation dosage during a specified period of time.

They would then take this dose profile and multiply that by the time that the worker spent on the job and come up with the total amount of dosage. This dose -- dose profile is a

standard radiation exposure rate which is multiplied by the amount of time worked, giving the total amount of radiation exposure for the worker.

In 1962 I was working with an IBM 12K computer that did not have the capacity nor the expertise to calculate complex dose reconstruction profiles, and with limited keypunch card storage information, which is now obsolete.

A work site dose reconstruction profile was a very important tool and an ever-changing means for calculating and tracking radiation exposure. The safety department maintained a current dose reconstruction profile for each unique work site at the Destrehan uranium plant. When a uranium processing job stream was modified and changed to improve production and/or to improve health and safety conditions, the safety department would calculate a new dose reconstruction profile to reflect current working conditions. And as a previous speaker pointed out to a chart showing that lower urinalysis reports indicated that over the years the working conditions at the plant -- as

the urinalysis went down, the working conditions went up.

NIOSH may have, for example, the latest 1957 site reconstruction profiles for each work site at the St. Louis Destrehan plant, and these 1957 profiles can be used in dose reconstruction for the time worked at the Destrehan plant during 1957. On the other hand, a 1957 dose reconstruction profile is not a valid measure of radiation dosage for any earlier years of 1949 through 1956 when the same work sites were more primitive and had a more hazardous environment.

In addition, there is no specific dose reconstruction profile to measure the ether house explosion, the exploding radium processing bombs, the overflowing raffinate tanks and other production mishaps.

Thank you for your time, your attention and consideration. And may I add a full context of my speech for the records?

MS. BROCK: The next worker that I have actually is what -- it's a claimant, a survivor claimant. His father was a worker. His name is Eugene Pape and Steve Pape would like to

come up for a couple of minutes and just talk about what it was like to go through that telephone interview.

MR. PAPE: Hello, my name is Steven Eugene Pape. My father was Eugene C. Pape. He worked at the Destrehan Mallinckrodt Chemical Company from 1945 -- through 1945 till his death in May 10th, 1977. He was diagnosed with carcinoma lung cancer April 21st of 1977. My mother died of complications of diabetes September 6th of 1999.

It was very difficult for my mom and I. I was 17 years of age. My -- my dad was 58. It was very difficult for us for those years. My -- my dad was very adamant about not speaking about his -- his work. I never knew what he did. He got his job right after -- at Mallinckrodt right after World War II. He was in the Army in the south Pacific and received a purple heart. He was -- like I said, he was very adamant about what he -- about his job. He never ever spoke about it. We never knew what he did whatsoever until October 28th of 2004 when I had to do the NIOSH dose reconstruction.

Here's a -- here are some of the questions, and I could not answer them accurately, but I did the best I could. It says here, building location, Building 7. And it says production operator. I never knew that. It says did the covered employee participate in a biological radiation monitoring program -- urine, fecal, breath, in vivo, whole body count? Answer: Don't know. Was the covered employee ever restricted from the work place or certain job duties because they had reached a radiation dose limit? Don't know. Was the employee ever required to have a medical X-ray for this job as a condition of employment? Answer: Don't know. Was the covered employee ever involved in an accident during radiation exposure or contamination? Answer: Don't know. It says can you name coworkers or other witnesses such as consulting industrial hygienists or radiation safety specialists who can confirm or expand upon the information you have provided us? Answer: No. Are you aware of any records related to the information you have provided that may help us estimate the doses for the covered employee? Answer: No. It says have

we missed any questions -- sorry, have we asked -- have we missed asking you about any conditions, situations or practices that occurred during this job which you think may be useful to estimate radiation doses for the covered employee? Don't know. Comments were he worked seven days a week for a number of years, and that's -- it was very hard for me to answer these questions, but I did the best -- the very best I could, to the best of my ability, so that's -- I'm sure that this is a lot harder for -- for widows or widowers of -- of these workers. And I know that it would have been very hard for my mother, so thank you.

MS. BROCK: Would it be all right -- I have a couple of more workers that have came (sic) a little bit of a distance and I said they would keep it to about three minutes, and then I have just like one sentence and we're finished. Is that okay?

Next I'd like to call Bob Leach -- Robert Leach.

MR. LEACH: My name is Robert Leach and I went to work for Mallinckrodt in 1950. I was

transferred to the uranium division in '52. I worked down in Plant 4 from '52 to '57 and then I was transferred to Weldon Springs to -- until they closed the plant, 1965.

When I first walked into Plant 4 I'd never worked in such a dirty and filthy place in my life. I was assigned to help make the bombs, and around on the floor there would be green salt, there would be magnesium fluoride all over the place, and it was the same area which they used the jolters and everything to fill the liners full -- with. And this was all over the area, and many times these -- has been stated before -- these -- well, we called them bombs, but actually they weren't. But anyway, they came through the side of the -- the shells and it was up to me and many others, after they cooled down, to go into those furnaces and to clean them up and to chip out the molten metal and all of that inside the furnaces.

Now this was a furnace where they used -- put the small ones in, which was about -- I believe about 300-pound ingots that came out. And then later on, why they -- we started putting them into the bigger furnace, and sometimes the

metal mol-- or the metal would be about a 3,000-pound ingot. And many times -- this happened the same way in the -- in the furnace. It would come out in the furnace, and then it was up to me and many other operators to get in there and clean that out, all the slag, magnesium fluoride and the metal. And more than once the metal came completely through the bottom of the furnace and would -- would be running out into the area. And of course we were -- common sense told us to get the hell out of there, and we did until it cooled down. But then we had to go right back in again and clean it all up.

I had one foreman or somebody there told us this metal won't hurt you, said -- like these 3,000-pound ingots, you could set on them all day and anything that you absorbed in your body would be gone within seven days. Or if you want to take a piece of paper and put it over it and then you can set on it, it wouldn't bother you there. Well, they didn't know what in the hell they were talking about, as they found out later.

And this -- this went on for quite some time,

and our exposure on this depended on who the foreman told you to get into the furnace and clean it out or ever what needed to be done. And this is why there is no way in the world they can take a chart and all of that and figure out what each of us was exposed to. They're just whistling in the wind if they think they can do it because it is impossible. And I know, ladies and gentlemen, this is -- petition was up to 1957, and then I went to Weldon Springs. But out there, in case I'm not around by the time we get around to Weldon Springs, which is very likely, it was many, many times that we worked anywhere from 40 hours to 76 hours a week. We would work 12 hours a day and Saturday and Sunday. Now that's just not me 'cause I was a foreman part of the time, but it was all of the operators. Now how are you going to figure out one man's exposure on this? And like I said before, there's no way in the world that you can figure it out. Thank you.

MS. BROCK: I would now like to ask Ed Luecke to come up, please. This is the final worker that I have to speak today, and then I just

want to wrap it up with a couple of comments.

DR. ZIEMER: Denise, for our recorder, could you give us the name again?

MR. LUECKE: Yes, would you --

MS. BROCK: Yes, Ed Luecke.

DR. ZIEMER: Ed Bicky, B--

MR. LUECKE: It's spelled L-u-e-c-k-e. I started to work for Mallinckrodt May 6th, 1947. At that time I was in Plant 4, and Plant 4 basically was two floors. The one floor below was below ground level and I went to work and they had what they called coffins. And these coffins -- we'd take what we called brown oxide and put them in there and they treat it with (unintelligible), and then this (unintelligible) would turn that brown oxide into what we called green salt. We had two -- four of us worked down there. One of the persons who's a -- Brad at that time, he was a lead man -- he was the one that added the (unintelligible) into it. And the other person, like myself, all I did was to pull these out and put them (unintelligible). It was a very, very hot job. And these other two were the ones who took and put the green oxide

into drums to be weighed off, and then they put brown oxide on -- on these -- and these are called -- what we called coffins. You put those in there and after that the salt would take a -- later on be mixed with magnesium and blended together.

And they asked about badges, we had no badges. We had nothing, and we had no vacuum to pull us away. And they took the -- we mixed those two together like the magnesium was put in on top of what we called green salt, we had all these fumes. We did have -- the company did give you a respirator, but it was made out of hard rubber and that was very uncomfortable to have on. We just forgot about that word.

And after that, I was moved -- after Plant 4 was done away with, I was moved to Plant 6E. Well, 6E was a much better plant and when I went in there and went to work -- like my job at that time -- I was a utility man, moved around a lot. Down at Plant 6 I moved around a lot of jobs. Now we had what they called a vacuum that drags all this away, and on the inside there there was a huge bag and the -- the bags would be vacuumed, pulling it up, and

on the outside of those bags they had air rings and the air would go up and down and blow that dust loose that would drop down and that material you were talking about going to the airport, that's how it got to the airport. They'd take a load of that in trucks and move it out of -- anyway, what had happened, there's electric eye on the inside. Anything that come through breaks that beam of light in any way, it shuts it down. Well, and that worked real good until later on, would say about three years later, I go to foreman one particular morning on a Monday and I said to him that number two system up there will not stay on automatic. You mean to tell me you worked on Saturday, time and a half and Sunday double time and you come to me on a Monday and you tell me that that system won't stay on automatic? Put that thing on manual and forget it. All these persons on the outside walking around saying I'd, you know, get a good breath of air in the morning.

What they were breathing is all this dust -- well, later on they moved that to Weldon Springs, but the conditions at that Plant 4,

they were -- oh, just deplorable. I mean you never realized -- I need to -- about time? Okay. And I want to thank you for your time and listening to what I had to say, but I have to leave now. Thank you.

MS. BROCK: I would like to thank everybody again, but I'd like to give a special thanks to the workers, claimants that I had come up. They are absolutely a wealth of information and, to me, as a daughter of a worker and a -- you know, a daughter of a claimant, this procedure seems somewhat backward to me. I love the fact that SC&A came in to talk to workers, but it just seems to me -- and I don't mean this in a bad way to anybody, but it just seems to me that this sort of thing should be done while you're doing the site profile, or before you do a site profile, and to incorporate these workers' statements because it's so relevant. They are absolutely amazing and their -- their memories are impeccable. They trigger each other's memory and I -- I just think that sometimes instead of guesswork maybe we should talk to them first, not after. And I also wanted to state for the record that

I know that NIOSH feels that there are certain things that they can do to correct the site profile. And I listened to SC&A's report and myself, I'm not completely sure that if -- how much time it will take to actually do all these revisions. And even once they're all done, there are no assurances that dose could be done even after that, not -- not scientifically based. We're wasting time.

Again, I just have to stress that. I -- I know there was an environmental issue. I -- I don't know how much is involved with that but I would like the Board to actually really think about that and think about how much time this could take. And then even after all that time, would it be fruitless. And this law was enacted to help these workers and these claimants.

Again, I think it's time to act and I -- I hope you act on their behalf. I thank you again very much.

DR. ZIEMER: Thank you, Denise, for a very articulate presentation.

We're going to recess now for lunch. We will -- let me see how we are time-wise. It's 12:30. We're going to shoot for 1:30, according to the

Designated Federal Official. Let's try to be back about 1:30. We'll reconvene. The Board will then discuss further the Mallinckrodt petition at that time. Thank you very much.

(Whereupon, a recess was taken from 12:30 p.m. to 1:45 p.m.)

BOARD DISCUSSION, MALLINCKRODT SEC PETITION

DR. ZIEMER: I'd like to call the meeting back to order. We're going to begin a discussion of the Mallinckrodt SEC petition. This is a discussion of the Board members. They may call on the petitioners or NIOSH or our own consultants, SC&A, to assist in answering questions pertaining to this issue. At some appropriate point when Board members feel that they're sufficiently informed of the issues, the Chair will call for a formal motion of some sort. There are several possible options, but we will ask for, at some point, formal action. Before we take such action I will also ask that the legislative requirements be read, and I think we have someone searching out to get the original language, so counsel is getting that for us so that Board members, at the request of Mr. Owens, we will read the language so we know

exactly what the statutory requirement is in terms of the actions that we may take.

So let me open the floor for discussion. Any questions of either the petitioners, of NIOSH or of our own consultants -- or general observations or discussions on the petition. Who wishes to begin? Yes, Leon will begin.

MR. OWENS: Dr. Ziemer, I would like to ask Dr. Makhijani, in terms of the review that SC&A performed on the site profile, just would like to know whether or not, in terms of the other documentation that SC&A has reviewed as part of the site profile, if the completeness and the accuracy of the records is as we have heard earlier. I'd just like to hear his comments in regard to that.

DR. MAKHIJANI: Well, aside from the question of radionuclide ratios, which we've discussed quite a lot and where there may be data in the Fernald K-65 silos -- and I wasn't able to track that, but that might be possible -- I think there are data sufficiency questions in -- in several areas. One of the more important ones I think is the question of infrequent incidents. We've said that the analytical

procedure isn't demonstrated, but also who was present during infrequent incidents is not known because these infrequent incidents, like bag ruptures and severe foaming spills, are -- are not well documented, to my knowledge. At least I haven't been able to find the documentation.

I believe that in order to -- to -- to make a -- a dose estimate of some kind, either some very maximizing assumption has to be made with different solubilities because there were these acid fumes that might have had uranium. You could have had Class S -- so the whole question of infrequent incidents I think is a pretty big one.

I mentioned environmental dose several times, Mr. Owens, and I think the importance of that should not be underestimated. The CDC itself has spent quite a bit of money, many millions of dollars, sponsoring studies of environmental releases from nuclear weapons plants. And I was surprised at the magnitude of the partial estimates that were made in the '50s. This would apply not to the workers with bioassay, but there were 20 percent of the workers who

were not monitored, and so you've got 20 percent of the workers for whom you would -- now this wouldn't be a full-scale research project, but just to give you an idea, the CDC dose reconstruc-- the reconstruction of the source term, which was a major part of the study of Fernald that was sponsored in the -- in the 19-- early 1990s cost $6 million. And the Fernald plant was fairly similar, broadly speaking, to the Mallinckrodt plant. And while this would not be a similar research project and you could undertake some maximizing, I don't know of the data that exists that would allow you to make maximizing estimates for environmental dose. In fact, for Plant 4 I -- I did not find any environmental data at all. I mean I just found one document with some information. I have no idea if more exists or not, and I don't think at this stage NIOSH should say whether it knows, but I haven't seen any indication that NIOSH has any information about this more than what we've said.

There's a question of the correction factors for the roving workers, which I mentioned in passing. This -- we -- we -- I think these

workers were badged. There's a whole set of analytical difficulties that would be pretty severe, and I think one of them would be what kind of correction factors do you use for external dose.

So there's a -- there's -- I think the -- both the analytical revisions to the TBD that need to be made would be -- are very major, and there are some data gaps. That's the -- the -- the reason I said, or we concluded that at this stage we don't know if everything -- when all is said and done, we can't really be sure at the end that you could construct a scientifically defensible dose.

I'll give you a short example and -- and then pause, because, for instance, your typical uranium intakes, based on bioassay, are in -- in the 10,000 to 100,000 picocuries per year range. If you apply factors of several hundred for radium and a factor of 100 for thorium and a factor of 4, do you wind up in a place that's reasonable. We have pretty serious question about whether radon breath data are suitable. And certainly the people who were monitored for radon breath do not exhaust the population of

workers who were exposed to non-equilibrium radionuclides. I believe that proportion of workers was very likely to be much more than 15 percent.

So there are some real -- real data problems in relation of which workers, even after you've made maximizing estimates, that -- that would need to be addressed. That's why we couldn't say whether, at the end of the day, you'd be able to arrive at a reasonably based -- scientifically based maximum dose. Thank you.

DR. ZIEMER: Thank you. Before we have the next comment, I just want to double-check and see if Mike is -- Mike Gibson is on the line. Mike, are you with us this afternoon?

MR. GIBSON: Yeah -- yeah, I --

DR. ZIEMER: Thank you.

MR. GIBSON: -- (unintelligible) --

DR. ZIEMER: Okay, and feel free to call out, Mike, if you have a question from where you are.

MR. GIBSON: Absolutely. Thank you.

DR. ZIEMER: Jim has a follow-up on that last comment -- Jim Neton.

DR. NETON: Yeah, I'm sorry, I'd just like to

address this -- this one issue, at least, of the -- the inability to reconstruct infrequent incidents. It struck me as odd in the -- in the report when I read it last night again, and it still strikes me as odd that -- it's somewhat counter-intuitive that SC&A contends that somewhat frequent incidents can be reconstructed using chronic inhalation intake, but infrequent incidents cannot be. In a sense, if you have an infrequent incident and we -- and we model a chronic exposure, then that infrequent incident, if it occurred, would actually drive up the chronic intake so that the integration of the picocurie per liter days excretion would essentially remain fairly constant, and we've demonstrated this with some models within our organization.

Take, for example, this ten to the fifth picocurie per year intake that Dr. Makhijani speaks of, which is fairly normal when we're doing these calculations. If a person had an intake that resulted in 100 times the maximum allowable air concentration for ten, 15, 20 minutes -- and you've heard workers testify that in those off-normal situations,

particularly in blowouts, they would leave the area; they were not going to stay there -- it would add a very small incidental increase to the overall intake. And we contend that that -- it would even be included in the chronic intake model. You can't have several intakes that are acute and not drive up the chronic intake model at the end of the day. So I want to clear that up. It's very counter-intuitive to say you cannot do infrequent inci-- intakes. In the area of environmental dose, I'd just like to mention that 80 percent of the workers did have monitoring data. A number of the workers that were there on that chart were workers, as Denise Brock correctly pointed, probably should have been monitored, we just don't have their data. So they would be monitored using some sort of coworker surrogate data. The remaining few that are clerical types and administrative folks certainly could be monitored, and the thought crosses my mind that the lower bound of the air sample distributions might even be appropriate.

DR. ZIEMER: Arjun, did you have a --

DR. MAKHIJANI: I think there's a

misunderstanding about what I said. I didn't say that infrequent incidents couldn't be modeled. I said that a claimant favorable way or maximizing way hasn't been demonstrated. I did work during the June 2nd -- on June 3rd I think we discussed this question of whether routine intakes, along with an infrequent -- if you assumed an infrequent intake, one incident during a six-month period as compared to a routine intake, would that drive up the dose, and it was thought not -- Mr. Allen thought not. And then he was surprised, when we ran a check, that it did. The -- if -- if you assume an intake just after the last bioassay, as has been suggested, assuming there's only one incident and the bioassay represents that one incident, it becomes very sensitive to the solubility assumptions because you have only one -- you have only one bioassay every six months, or even one bioassay every year. And I -- I bel-- I'm not saying -- the SC&A position isn't that it can't be done. The -- we agreed, I thought, on June 1st when Cindy Bloom correctly pointed out that when you have frequent incidents they do look like routine

intakes. So that -- that was a major issue at the last time that we had brought up and we had questioned it and -- and we believe that when workers actually experienced frequent incidents like blowouts when they worked in Plant 4, then this would show up in the bioassay and a maximizing way can be found. And I don't think there's an argument about that, but I do believe there's still an argument about - And 100 times did not apply to uranium intakes. I think that was a misunderstanding, too. I just said that if you have a ten to the five intake from uranium and then multiplied that by several hundred for radium and thorium, then you might wind up with numbers that might not look so realistic or defensible on the scientific grounds for total intake. Thank you.

DR. ZIEMER: Thank you. Okay, Dr. Anderson, then Dr. Melius.

DR. ANDERSON: Yeah, just -- just a couple of observations. I think one of the -- the issues that I'm grappling with is what we heard from Senator Bond and we've heard from a lot of the participants, and that's the timeliness issue

of how soon and when will these be done. Clearly an SEC petition -- the need to spend a lot of time doing reviews is quite a bit less, so there's more timeliness there. And I guess part of my questions this morning dealing with 109, and I guess I would ask NIOSH is it reasonable if -- if in fact they were going to move ahead with doing these dose reconstructions, of which I understand really no detailed ones have been done yet, could these 109 be accomplished in the next three months so we get a sense at this point the question about the feasibility of all this, you know is -- hypothetically we've seen or theoretically or technically it -- it -- and we have to take NIOSH at their word and they're saying they can do it, it just hasn't been done yet. If -- if that kind of time frame we could expect they would be done, I -- I would be much more comfortable in hearing that there's a residual of people who -- who somehow are still in the system but we don't know where they're at, so how -- how quickly do you think you could move on these if -- if you were going to be tasked to -- to do this?

MR. ELLIOTT: Well, I appreciate that question again, and I have some information from -- from Cincinnati that would inform us a little more. There are 151 cases that started employment prior to 1948. That means -- this number, 151, would have less than 250 days in that 1948 time period, so they wouldn't fit into that class.

DR. ANDERSON: Yeah.

MR. ELLIOTT: Okay? So you understand. Forty-one of those are Mallinckrodt workers and -- excuse me, 107 are Mallinckrodt only workers, 41 are Mallinckrodt and Weldon Spring workers, so that we'd have to account for Weldon Spring. And three are Mallinckrodt workers and at some other AWE site, so if my -- oops, I just lost the whole thing. Modern technology, a bane.

DR. ANDERSON: 107, I think.

MR. ELLIOTT: Yeah, 107 -- 107 would be the number --

DR. ANDERSON: Pretty clean.

MR. ELLIOTT: -- and I would offer this in response to your question, that I think in four months time we can work through those 107. But a month of that four months I think would take for us to get with SC&A and iron out any issues

on the site profile that remain, and make sure that we approach these 107 with full due consideration and a full, thoughtful, deliberative site profile that'll aid us in working through these -- these 107 claims. So I would say give us a month to work that out and three months to work the claims, the 107.

DR. ANDERSON: Okay. And another just point I wanted to -- being a epidemiologist and a statistical person, the graphs that were showing the lognormal distribution of the air monitoring and the urine monitoring, and some very impressive R-squareds, my understanding is those R-squares are related to lognormality, not that the air concentrations correlate exactly with the urines for the same -- I mean typically you would do an R-square looking at --

DR. NETON: I'm sorry, that -- yeah, the R-square value represented the goodness of fit to a straight line --

DR. ANDERSON: Right.

DR. NETON: -- on that graph.

DR. ANDERSON: So until we get to the individuals, you won't know are the high air

measurements --

DR. NETON: Yeah, I'm sorry, I never meant --

DR. ANDERSON: -- correlated with the levels --

DR. NETON: I'm sorry, I didn't mean to imply that and I --

DR. ANDERSON: 'Cause an R-square of .98 for a biologic thing like that would be unheard of.

DR. NETON: Right, my --

DR. ANDERSON: So you would be arguing that in fact you chose one and then you assigned values of the urine based on the air or vice versa and that's how you got --

DR. NETON: Yeah.

DR. ANDERSON: -- such a great correlation.

DR. NETON: Well, actually the intent was to demonstrate that the data are lognormally --

DR. ANDERSON: Yeah.

DR. NETON: -- distributed --

DR. ANDERSON: Yeah.

DR. NETON: -- which --

DR. ANDERSON: I understood that.

DR. NETON: Yeah, okay. I'm sorry.

DR. ANDERSON: I just wanted people -- when you put the two up there, the assumption is that somehow the value of one correlates with the

other, but it's really the distributions that you were looking (unintelligible).

DR. NETON: Correct, but I would point that the slopes of those lines, they parallel fairly closely --

DR. ANDERSON: Yeah.

DR. NETON: -- which indicates that there is --

DR. ANDERSON: Yeah.

DR. NETON: -- increasing urine values with increasing air concentrations, although they weren't -- I didn't correlate them individually, which is --

DR. ANDERSON: Yeah.

DR. NETON: -- I think what your impression was.

DR. ANDERSON: Yeah, it has to do with the population, not individual correlation between the value, so it kind of -- how it would be used for an individual, you might have a lot more discrepancy, just luck of the draw.

DR. NETON: Well, actually we've committed, in cases where --

DR. ANDERSON: Yeah.

DR. NETON: -- where the -- the raffinate issue comes into play, that we would use the higher

of the two dose reconstructions, either the air monitoring data or the reconstructed dose using the urine and applying a ratio and then applying an appropriate geometric standard deviation to each of those. And whichever results in the higher -- essentially dose to the organs -- would be used.

DR. ANDERSON: Okay. And -- and the other thing I just wanted to say, following back to the last meeting that -- where we gave you -- asked -- some charges that I think a lot of the questions that we raised that we deferred voting on this have in fact been addressed. The validity of the data, I think we're much more comfortable that, you know, the likelihood of it being doctored in any way is -- is relatively remote, so I think that -- I want to say thank you for doing that.

Again, my only issue is the one of hypothetically -- you believe you can do it. We've heard that you don't think we can do it, and the only way to really know is --

DR. NETON: To do it.

DR. ANDERSON: -- is doing it, and that's why I've -- if -- if you're prepared to do that in

a timely fashion, I think that'll address some of the concerns of the issues.

And then the only third one is we're sort of left with three groups of people, the pre-approved group. Then you have people who have cancers that are not covered by the SEC group who worked both pre- and post-, and how one addresses that we may have to talk about later. And then we have the group that I was going to focus on, those that really would only fit into this group, that we should be able to move on quite expeditiously.

DR. ZIEMER: Yes, Dr. Melius is next.

DR. MELIUS: Yeah, just to pursue that point a little bit. You know, I think the crux of this comes down to how we sort of pull together two related but sort of divergent sets of data in terms of how they've been -- evaluations, how they've been put together. One is the SC&A evaluation of the site profile and the second is this -- NIOSH's evaluation of the SEC petition and do that. And I think that somehow we need -- need to make those work together and I think we have sort of several different approaches that -- that could be used. I am --

like Henry, I'm reluctant to simply take NIOSH at its word without understanding what the process would be for -- you know, they say they can do individual dose reconstructions. Well, you know, let's see them do it. Let's -- let's get that process moving. It -- it can't go on forever and I think feasibility is a -- a -- something that we -- we have to consider in some way, though, albeit it's -- there's no fine line there and I think we're going to -- would struggle to come up with what is reasonable in that way and -- and there's probably a divergence of opinion on the Board as to what would -- what would be reasonable to do.

As part of resolving that, I think -- question comes up is what -- what do we do procedurally? And you know, one is we could deal with the -- the petition and take NIOSH at its word and -- on the assumption that NIOSH can do what Larry said they can do, we can, you know, reach some decision on -- on the petition, saying -- turning it down and saying they should be -- individual dose reconstructions are feasible. Another option is to wait and see what happens

when this -- NIOSH works with SC&A to resolve the issues on the site profile review. And that, I think, we -- could there be issues that will come up that would say that certain -- significant segment of these workers cannot have their dose reconstructed? Would that -- might that be identified in -- as part of this effort to resolve the -- the comments that -- that NIOSH -- that -- excuse me, that SC&A made on the NIOSH site profile. It may be, I don't well understand that completely. I was not present at the subcommittee meeting this morning so I don't know to what extent some further detail was discussed about that. But I think certainly one option is we postpone any decision until we've seen where we get with that resolution and maybe we have firmer evidence that NIOSH can do -- that these issues are resolved and that, at least in a general sense, there's nothing that would -- would be in the way of NIOSH being able to do full, complete, individual dose reconstructions. A third option and when -- was the option I tried to offer at the -- at the last meeting and one that, even if we don't do it here, I

think we need to consider for future SEC evaluations, is -- I find it very hard to simply accept or reject NIOSH's sort of very general statement, we can do them all/we can't do them all. And even though there's some refinement to that in terms of how they -- they work to define the class and -- it -- it's still pretty broad -- a broad stroke. And when we get into a complicated site like Mallinckrodt where there's a significant amount of data, we're not sure if it covers every situation and so forth, that kind of a broad stroke I think is very hard for us to evaluate without really seeing how all that information that is available would be applied in some specific cases.

So whether it's for Mallinckrodt or, if not for Mallinckrodt, for future cases, I would be much more comfortable, and I think the Board and the whole process would be much better served if -- if NIOSH would actually work through some of the cases, some representative number of cases, examples, to -- to really test and evaluate in more detail whether or not it really is feasible to do dose reconstruction.

So for Mallinckrodt, you know, another option is that, in addition to trying to -- that we work to resolve the SC&A comments on the site profile, we also ask NIOSH to do some example, representative dose reconstructions. Come back to us, show that they -- they are really capable of doing that. I was -- I was hoping they would do it for this meeting. They -- they did it part-way. They didn't do it as completely as I think would be helpful to us.

DR. ZIEMER: Thank you, Jim. And you have saved the Chair from pointing out the options, I think, so -- and -- and done it very well.

DR. MELIUS: Good.

DR. ZIEMER: I -- I think before we, however, reach the point of action, we may want some additional comments and so on. Roy?

DR. DEHART: I would like to ask NIOSH if I heard correctly this morning that you could do a self-identified exclusion from doing the -- the dose reconstruction. In other words, you can identify an individual in whom you cannot do dose reconstruction and move -- in the sense like a -- you're -- you're identifying a specific cohort. Is that correct? You haven't

done that yet, but you could do that.

MR. ELLIOTT: Yes, both our dose reconstruction rule and our SEC petition rule afford us an opportunity to identify situations or cases in the dose reconstruction arena -- we could identify a case we can't do a dose reconstruction for and operate that -- I think it's under 82.7. I believe 83.14 in the SEC rule offers us the ability to say here's a situation, a class within a facility where we cannot do dose reconstruction, and we work with a claimant currently situated in that class to become a petitioner, and we're working through that right now on -- on some of these situations where we feel that there's insufficient data to do dose reconstructions, so we're trying to work with current claimants to establish a petition.

DR. DEHART: Thank you. That -- that would then broaden the opportunity, if -- if we chose to vote for them to go ahead and move with dose reconstruction.

DR. ZIEMER: Jim.

DR. NETON: I'd just like to add to what Larry said, and it's true, when we do these analyses

it's very difficult to predict all -- all possible combinations. And so we do -- and we do the best we can to present objectively the data that we have and -- and the fact that we think, for all the classes we can conceive within that group, we can do dose reconstructions. But it doesn't preclude us from, when we start doing dose reconstructions, saying whoa, there's a special case or two in here and maybe even in the -- in the interview or there's some incident that occurred that we were previously not aware, we would be able to self-identify that and then that would go through this process that Larry just mentioned. So you know, it's -- we -- we can't -- I don't think I'm standing here saying with 100 percent certainty we can do every -- we believe we can do everything -- every single one based on all the data that we've looked at. But short of doing all 109 dose reconstructions, we can't say that. That's what I'm trying to say. And there is a possibility that, you know, something is out there that we just didn't anticipate.

DR. ZIEMER: Did you have a follow-up on that,

Roy?

DR. MELIUS: I actually have something.

DR. ZIEMER: Yeah, I'll come back. I just also want to remind the Board, superimposed on the options mentioned, the issue of timeliness in terms of delaying decisions versus moving forward. We need to have that in the background.

And then I also want to pose a question -- maybe I will ask Denise, because I heard her talk about a sub-- I think you used the term "sub-cohort," and you maybe specifically mentioned raffinate workers. I would like to learn whether or not, for example, are workers classified as raffinate workers or would one be able to identify a priori the raffinate workers?

MS. BROCK: I was --

DR. ZIEMER: Did I understand what you said correctly, Denise?

MS. BROCK: You did. I was actually suggesting Plant 6 workers, and I believe it was page 29 maybe of 86, if I remember correctly, in Arjun's report. And I'll have to ask Arjun, was that Plant 6 that was the raffinate area?

Is that correct? I'm thinking it was.
DR. ZIEMER: Well, I understand that part of it. I'm asking can you -- can you go to job descriptions -- maybe NIOSH can answer this --
MS. BROCK: Somebody else, yeah, would have --
DR. ZIEMER: -- and identify --
MS. BROCK: -- to answer that. I don't know.
DR. ZIEMER: -- and say a priori oh, this is a raffinate worker, or do you have to depend on the fact that maybe somebody took radon lung exhalation measurements or how -- how would one a priori identify if there were a sub-set, for example, of that type?
DR. NETON: It would have to be based on -- and this is the crux of the issue that we discussed this morning -- on the job title category of the worker and what they were doing in Plant 6.
DR. ZIEMER: But they would not neces-- they wouldn't be classified as a raffinate worker.
DR. NETON: No, but -- but the job categories are --
DR. ZIEMER: Might give you a --
DR. NETON: -- such that --
DR. ZIEMER: -- clue to it.
DR. NETON: -- you -- a clear-cut example was a

feinc operator, a cloth operator, those type of people. But as SC&A has correctly pointed out, it is broader than that. Anyone that is working, particularly on the reprocessing of the K-65 residue from the digestion process through, would be correctly identified as a raffinate worker that worked with raffinate in more -- in disequilibrium, let's put it that way.

DR. ZIEMER: Yeah, I didn't want to necessarily focus on that group except that I'd heard Denise mention that, but it was a follow-up to the question of, in a sense, could there be a sub-set within this group that you learn you simply cannot do dose reconstruction -- whatever that sub-set might be.

DR. NETON: Right, and Larry might be --

DR. ZIEMER: Or is it more likely just to be an individual in each case?

DR. NETON: It's more likely to be an individual by individual basis if we have the job category information. But one issue, and Larry may be able to speak better to this, is the Department of Labor, if -- if the SEC were identified as a sub-set of workers, the

Department of Labor actually qualifies those people based on their application as to whether or not they are in the SEC. We don't make that determination.

DR. ZIEMER: Yes.

DR. NETON: And to the extent that they would be able to -- to parse that out based on these more specific -- job categories are really part of the dose reconstruction process I can't speak to.

DR. ZIEMER: Okay.

DR. WADE: Denise.

DR. ZIEMER: Larry?

MR. ELLIOTT: Let me just add to that -- that at that critical juncture when DOL makes its determination of eligibility for a cla-- for a member of a class, they use the full case file that's been developed. That -- that development would include work history, information that we add to the file, both from the CATI interview -- from the interview process, but also from looking up in the data that Jim has -- has spent numerous hours going through, can we put the name with a job title, and we add that and they will use that.

DR. ZIEMER: Denise, did you have a follow-up on...

MS. BROCK: I was just curious if -- if Jim or Larry could explain it to where I can understand it, are you stating that the Labor Department would be the one to ultimately make that decision? Are you having to find the worker to fit the job title, and if... I guess I'm not understanding.

MR. ELLIOTT: Development of the case file starts when the file is submitted to DOL. DOL's claims examiners work with the claimant to make sure that the -- the file is determined eligible by the diagnosis, through a death certificate or medical -- physician's report or whatever, and that the person worked at a given site.

They then send that over to us once it's deemed eligible as a claim and we work up the work history. That's part of what we go through -- the interview process I know is a -- a major concern to a lot of people. It's not a required process. It's something we've added -- we felt all along that it -- anything that we could gain from actually using a questionnaire

and we have to use a standardized questionnaire, but anything that could gain we would benefit the claimant would benefit from that. That's part of this development. As we go through data -- data such as what Jim presented this morning -- where we actually have individuals' names on these cards and the job titles that they held during the time that the sampling or the measurement was acquired -- whether it's a dust sample or a urinalysis sample or a badge result, we have those names. Jim was able to go in and find 109, which is now 107, but he found 109 people and he knows what their job titles were. We'll have to provide that to Department of Labor. And yes, Denise, that is their job. We don't make that determination. They're required to make that determination of eligibility for the class. We help them as much as we can by providing this additional work history information that's been developed. Does that -- does that help?

MS. BROCK: It does. Thank you.

MR. ELLIOTT: Okay.

DR. ZIEMER: Thank you.

DR. MELIUS: Can -- can -- can I just add to

that? I would think, though, if someone gets forwarded to you for individual dose reconstruction and as part of your process you discover that they really should have been in the Special Exposure Cohort, you would refer --

MR. ELLIOTT: Yes.

DR. MELIUS: -- them back.

MR. ELLIOTT: Oh, absolutely.

DR. MELIUS: Yeah.

MR. ELLIOTT: Yes, we don't want to --

DR. MELIUS: So I --

MR. ELLIOTT: -- see anybody mis-- misclassified here.

DR. MELIUS: Yeah. Yeah.

MR. ELLIOTT: Yeah.

DR. MELIUS: So there's a safety net, so to speak --

MR. ELLIOTT: Absolutely, yes.

DR. MELIUS: -- for that. I -- I think we recognize -- this is back to Jim and Larry's comments earlier. I think we recognize that as part of individual dose reconstruction -- for example, for this Mallinckrodt cohort -- that you would -- you may identify people -- individuals, you know, a small number, that --

for whom, for whatever reason, there's just not adequate information for dose reconstruction. I think what we're trying to avoid is -- have -- finding out down the road that there's a large percentage of this group, you know, and what that large is, is it 20 percent or, you know, 15 percent or whatever it may be that -- that you really don't have adequate information for and so we -- I think we need to fine-tune the process, at least low enough that we can try to identify those -- those groups ahead of time and -- and I think I would actually argue for an interim evaluation step there, that we take a look at the site profile review from SC&A, we work to resolve that and see if out of that do we feel that there is a sub-group that -- such as the Building 6 workers who there may not be adequate information for. I don't have a good sense from our discussions so far how -- to what extent we believe that is a possibility, but certainly it's been raised and cer-- certainly something that at least to me would be a cleaner process if we -- and a better process is if we take an interim step, which would be resolving the SC&A comments. At

the same time that would allow -- I think give NIOSH a better sense of are there -- is there going to be a significant proportion of this cohort that -- of this petition that they will not be able to do individual dose reconstructions on and -- and that we delay our decision until that point in time, rather than having us make a decision now and then having to change it -- I don't know exactly what the process would be. I'm sure it's workable, but I -- also I'm afraid that it will just -- I think we want to avoid unnecessary delays if we can -- can help it.

At the same time I think that process -- if we did it that way, then we wouldn't slow down the individual dose reconstruction process 'cause it's still a necessary, you know, one-month step to -- for us to try to resolve these SC&A comments on -- on the site profile.

I would also just add, though, that -- that -- that is presuming certain amount of logistical work on the part of NIOSH to -- can we pull the Board together in a reasonable time, and if the next Board meeting isn't -- isn't feasible for three or four months, then I think we're --

have to consider other options.

DR. ZIEMER: Right. Unfortunately we've been pushing both our contractor and NIOSH against our own meeting time deadlines. And realistically, we end up doing a disservice to them because there are issues that they need, in essence, to discuss and -- and try to resolve so that we have whatever level of agreement we can reach in advance. And where the disagreements are we know that they have at least talked and -- and these disagreements remain.

DR. MELIUS: Yeah.

DR. ZIEMER: But for -- for NIOSH to see the report for the first time a day or two before our meeting is very difficult, and that's not the contractor's fault. In a sense it's our fault 'cause we pushed the -- pushed the contractor to try to get things on a real -- very short time frame.

DR. MELIUS: Yeah, can -- can I just add --

DR. ZIEMER: Yeah.

DR. MELIUS: -- I -- I think -- regardless of how we deal with this, I think from the point -- perspective of trying to resolve these SC&A

comments on the site profile, I think it would be helpful if either the committee or the subcommittee could continue some of the dialogue from this morning -- as much as we can be specific about what we want pursued and what we think is important and what we think is maybe not as important so we can make that -- this follow-up as efficient as possible, I think it would be -- be helpful and I think it would be better for all and -- and I agree with you fully that I think it's unfair to expect NIOSH to have complete -- or comments on a report they only saw a few days ago, so...

DR. ZIEMER: And the same is true of the petitioners.

DR. MELIUS: Yeah.

MR. ELLIOTT: I was just going to have some of the similar remarks that you just made, Dr. Melius. I -- I think this morning we had a very good scientific discussion here on a report that just came out last week, and I don't think anybody's at fault here. I think it's just a set of circumstances that we operate in this program -- operate under in this program. Everybody is under a lot of

pressure.

But I would welcome this kind of a discussion that you just mentioned, Dr. Melius, about what are the critical issues that you heard this morning that you want pursued farther. I think that there was a good give-and-take that happened this morning. I think there was affirmative -- nods of affirmation around the table as I watched -- overheard the discussion and watched the body language at the table. And there were some issues that, you know, people were still wrestling with in their mind -- we were wrestling with in our mind, trying to understand what the point was being made by SC&A, perhaps. So I think that would help us a lot in trying to come to resolution within a month's time on finalizing a site profile based upon the comments that we've received. So I would welcome that. That would serve as good guidance to us.

DR. WADE: Denise.

DR. ZIEMER: Denise.

MS. BROCK: I second that, Dr. Ziemer, about it not being anybody's fault. But yes, it did put the petitioner, myself, in a situation -- such

as NIOSH, and obviously it was not SC&A's fault, nobody's fault, but it does put me at a -- at a disadvantage, as well as NIOSH. But I still have to go back to the issue of time and timeliness, and feasibility has to do with time, as well. And I have to state again for the record, these claimants are dying. They may not have a month. They might not have two months, three months. And I -- I just want to make sure that I understand this. Larry, are you saying that within a month that you will be able to go through absolutely everything that SC&A has in their audit review and take all the corrective actions and begin dose reconstructions and have those 109 cases completed by then? And if they are denied, are those defensible denials?

MR. ELLIOTT: I didn't say a month. I said it would take us a month to work through -- in my view, it would take us a month to work through the comment resolution aspect on the site profile. That's why I would appreciate this kind of discussion on -- and guidance on what are the most critical elements and issues in that set of comments that came from SC&A.

Then I said we would work very diligently to finish up those 107 cases in three months' time post that. I think there are some cases in that 107 -- I think Jim would agree with me -- that we could work on while we're -- we could have our health physicists working on certain types of cases without the benefit of the site profile resolution comments because they either have enough monitoring information of record or they -- the type of cancer is such that we can work through that and give a definitive dose estimate that would be a defensible probability of causation.

DR. ZIEMER: Thank you. Denise.

MR. GIBSON: Dr. Ziemer? Dr. Ziemer?

DR. ZIEMER: Yes, Michael. Hang on just a minute, Mike. Denise has a comment and then you'll be next.

MR. GIBSON: All right. Thank you.

MS. BROCK: Sorry, Mike -- and hello, Mike. I think I wanted to ask a question -- and I'm trying to think about how to word this. In Iowa there was a probability of causation chart developed. Is that possible that when you come back in that we can have one so that I can take

a look at the types of cancers, similar to what you did in Iowa?

DR. ZIEMER: Larry, do you recall what chart is being referred to?

MR. ELLIOTT: Yes, we worked up a -- we worked up a set of cases for Dr. Fuortes and Richard Miller in that regard, I believe. Could we do that? We certainly could do that, but we're at a -- it puts us at competing resources. You know, we -- we put people on task to do that, why not just put people on task to do dose reconstructions? Then from that you could pull together the dataset that you're seeking. That would be my thought, but -- Jim has a comment.

DR. ZIEMER: Yeah. Hang on, Mike. We'll get to you here. Jim Neton is following up on this comment.

MR. GIBSON: That's fine.

DR. NETON: Just to follow up on what Larry said, I need to point out that the Iowa dose reconstruction model was a one-size-fits-all model, so it was fairly straightforward to come up with the estimated doses and projected probabilities of causation. These dose reconstructions are going to be unique,

individual dose reconstructions, scientifically based. It would be difficult, if -- it would not be impossible. It would be very difficult and, like Larry says, ex-- you use a lot of resources, to the extent where we'd almost have to do the dose reconstructions to develop the chart, I think. There's no way to predict based on the amount of monitoring data -- you know, the individual monitoring data and then how much we're going to have to supplement using, you know, coworker data to come up with some chart like that. I think it'd be very hard.

DR. ZIEMER: Thank you. Mike, your comment?

MR. GIBSON: Yeah, and I'm -- you know, I -- I'm a little bit -- apologize for not being there. I'm kind of behind the eight-ball here and -- and I appreciate the phone hook-up, but it's -- kind of cuts in and out, but it -- if what I've -- what I'm going to say is not correct, you know, someone can correct me. But it -- it sounds like that there is a lack of individual bioassay data for some of these raffinite (sic) workers in Plant 6 and -- and that somehow NIOSH has determined that they can

take some kind of -- these monitoring results from air monitoring and give it a 100 to one ratio or whatever it is and therefore verify the -- therefore reconstruct a dose for each of these workers, at least in this Plant 6. And I just -- you know, I -- if I'm hearing all this correct and if that's all correct, it just doesn't seem to me that -- again, as I'd mentioned earlier about the -- the individual dose reconstructions, I don't see that -- I can see it being generic, but -- but how can NIOSH at least stand behind these dose reconstructions and -- and say that this is an accurate dose that can be defensible and feasible for each individual worker?

DR. ZIEMER: Yes, I think NIOSH has a lot of urine -- urine analysis data, coupled with the air data, and would use whichever one gave them the higher estimate. But Jim Neton can speak to that.

DR. NETON: That's --

MR. GIBSON: No, I'm -- I'm sorry, I thought I -- I thought I heard that there was no -- no or very little bioassay data for the raffinite (sic) workers in Plant 6. Maybe -- maybe I was

mis-- maybe I missed something and, like I said, I don't have all this information in front of me, but that's what I thought was part of the case.

DR. NETON: Mike, this is Jim Neton. I think what I hear you saying is that you recognize we have a lot of urine monitoring data, but it's primarily uranium data and we have no individual bioassay data for isotopes such as protactinium-231, actinium-227. That's true. But what we do have are these dust cards for 1,453 individual workers that were -- that give -- give job descriptions for their work during that individual -- by year for 1949 through '57, the position at different processes. And we have these 40-something dust studies that were done that -- that are alpha measurements that can be used to determine the amount of upper limit or bounding exposures, given appropriate geometric standard deviations, for workers at those individual processes.

MR. GIBSON: Uh-huh.

DR. NETON: So that -- they -- they are not generic. They can be specific, although I can't swear with 100 percent certainty there

aren't some that don't have cards that we would have to fill in the gaps. But -- but we do have individual cards for a large number of workers.

MR. GRIFFON: Jim --

DR. ZIEMER: Thank you.

MR. GRIFFON: Jim, just a point -- again, a point of clarification there. You have 1,453 individual cards --

DR. NETON: No, no, we have more cards than that. We have 1,453 workers --

MR. GRIFFON: Workers --

DR. NETON: -- who have cards --

MR. GRIFFON: -- cards --

DR. NETON: -- multiple years for each --

MR. GRIFFON: 1,453 individuals, but -- but there's -- I -- I mean the -- the dust concentration values assigned, the daily weighted averages assigned, were not necessarily each individual worker. They were assigned from those dust study data. Correct?

DR. NETON: Right, but -- it's confusing, but the time-weighted average for the worker is a composite of where he worked in the plant during that year. So for instance, if he were

at the feinc -- you know, the filtration press or whatever, it would say 24 weeks at this location, 15 weeks at another location, and those individual air concentrations would then make up the time-weighted average.

MR. GRIFFON: But the -- but the -- the individual ti-- the times are individual-specific --

DR. NETON: Right.

MR. GRIFFON: -- but the -- the dpm per meter cubed that's plugged into that equation --

DR. NETON: Are location-specific --

MR. GRIFFON: -- are from the study.

DR. NETON: -- right. That's correct.

MR. GRIFFON: Right, location-specific --

DR. NETON: Right.

MR. GRIFFON: -- so I just wanted to be clear on that.

DR. NETON: You're right, that's correct.

DR. ZIEMER: Denise, did you have a follow-up on that?

MS. BROCK: I don't really know if it's a follow-up on that. I apologize. I'm not a scientist, I keep saying this, and I'm not a doctor, so it's probably like pro poker players

playing with somebody that doesn't know if a pair beats a full house or whatever -- sorry, so just kind of bear with me. But I just wanted to restate a couple of things for the record, and maybe it is not something that needs to be said, but the way I understood, SC&A had stated that the basis for finding reasonable dose estimates are unlikely -- and what I heard SC&A say was that this was going to be a major undertaking, that all of this corrective action -- we don't know how long it could take. And at the end of it, we do not know if in fact it's going to even be workable or doable. And so I still have to go back to the FY 2005 where it states that these workers need to be put in in a prompt manner. This is not prompt. I filed this SEC petition over a year ago, or about a year ago. These people are dying. How long do we have to keep going through this? If this is this major undertaking and I'm -- I apologize, Larry, I think you're great, but I just don't understand what this 30 days is. Maybe I am dense, but if it's not going to be done in 30 days, how would the dose recon-- if everything's not corrected,

now in God's name are you going to have these dose reconstructions done? And if there's not anything on thorium-230 or actinium-227 or protactinium on these raffinates, how is this -- how is this doable?

DR. ZIEMER: Does someone want to give an answer or is that a rhetorical question? Everyone's hoping it's a rhetorical question, Denise.

DR. NETON: Yeah, I -- I think we've discussed this previously that -- that -- the air monitoring data can be used to support the inhalation intakes from the raffinate material. There's also a suggestion -- I think it's a very good one -- Dr. Makhijani indicated that if the Fernald waste stream and the silos can be demonstrated to be predominantly ore from the process, I think we've got a handle on that. So there's a number of approaches that can be used here to bound -- bound these estimates.

DR. ZIEMER: Arjun, did you have a comment on that?

DR. MAKHIJANI: Yes. I mean we -- we did suggest approaches, and there isn't just one

issue, as I mentioned when I was asked by Mr. Owens, but there -- there are a number of issues. And I -- I don't see that we have a clear idea of how all of them are going to be resolved. Perhaps we may have -- Jim may have identified something regarding the radionuclide ratios, but I think that remains to be demonstrated, first of all. But assuming that it is, I -- I don't -- at this stage we can certainly engage with NIOSH, but I don't know where we would wind up after 30 days. Obviously, I mean there's a long list of issues and we're -- we're willing to engage at the Board's direction, but I -- I have to say, at this stage we have a certain conclusion we've presented before you that a significant number of issues need to be resolved, and then at the end of 30 days or whatever you mandate, we'd have to come back to you and -- and tell you whether -- NIOSH will tell you whether they believe they've addressed them satisfactorily and we'd have to tell you whether we believe they've been resolved, and there's no guarantee of an identity of an answer, obviously.

DR. ZIEMER: Yes, I -- I don't think, as in

other cases, that if we did this that we would mandate a priori that everybody come to an agreement. It's -- it's the -- it's the issue of having a chance to sit down and say well, you've raised this; here's how we've responded -- and the give-and-take that you've done on other cases, that's what we're talking about. I forget the order here, who's next? Mark, were you next?

MR. GRIFFON: I think I was.

DR. ZIEMER: Okay.

MR. GRIFFON: Jim (unintelligible) of another comment, though.

I -- I was just -- just to speak to Larry's comment a little, I think that we -- the Board, along with SC&A and NIOSH, I think -- and we've done this to some extent on the subcommittee level -- can sort of identify or prioritize issues that -- that need to be resolved for purposes of resolving this SEC petition. So there -- there are some things in the site profile that we can kind of -- so me comments that SC&A has raised that -- that aren't certainly as critical. So I think we can prioritize ones that we believe would have a

major potential impact on -- on decisions on this SEC petition.

On top of that, I think a key component that I'd like to see is -- and I think Jim mentioned this earlier -- is -- is how -- how are these going to be applied in doing dose reconstructions. So I would -- I would like to -- you know, if we go down that path of -- of asking you to come back with -- with -- having some -- some more com-- some more comment resolution on the site profile, in addition to that I'd like to see some specific representative cases. And I'm not just saying ones that you can do with the data at hand right now. I'm saying take some of these assumptions on the raffinates and some of these other assumptions, once you feel comfortable enough with them -- because part of what we have to evaluate is feasibility and -- and -- feasibility, as Denise pointed out, is timeliness. So if you can say well, we've -- you know, not that we're still looking for some data to nail this down, but that we have it. So we need some representative cases and you can say here's how we're going to apply this,

and then we can look at both feasibility and sufficient accuracy for those representative cases. We have -- we -- we're going to see how those values are applied. And I don't -- I don't -- Jim made, you know, a very good presentation on how you've got different pieces of information that can be used to -- to -- to bound this sit-- situations. I guess there's -- there's -- you know, what I want to see is some representative exa-- representative examples of how that would be carried through, how -- for a Plant 6 worker, first of all you have to decide whether he -- he or she does or does not apply to certain raffinate conditions on their -- on their intake values and -- and whether they -- you know, so -- and you're going to tell me that we can't have that.

MR. ELLIOTT: Well --

MR. GRIFFON: Okay.

MR. ELLIOTT: -- I agree with you 100 percent. That is exactly what we need to do. But the issue that -- and reason why we couldn't bring that to the table today for Dr. Melius's request from last meeting is that we cannot bring an example dose reconstruction case to

you unless it's an adjudicated case. I'm sorry, but we're bound by that. We cannot bring an example dose reconstruction case to the floor that has not gone through the full adjudication process, and that will take more time than what I've proposed in my four-months commitment to you.

MR. GRIFFON: Yeah.

DR. ZIEMER: Okay. I think Wanda's next. No?

MS. MUNN: I'm not sure.

DR. ZIEMER: Go ahead, Wanda.

MS. MUNN: Henry was --

DR. ZIEMER: Henry was next, okay. Wanda concedes to you, Henry.

DR. ANDERSON: I guess I was -- what I'm trying to do is simplify the -- the process here, that this is a very complex site and the site profile is very complex and the site profile really is a kind of a universal activity and it has to sort of -- we can pick at it because it has to be able to address all possibilities. When you narrow it down to 105 cases, there may be some of the issues that are raised that aren't going to come up in some of the cases, so those -- and I think there are some broad

issues that we could sit down and, as we started out this morning and yesterday, nail them down. But all of the things that may come up in the future, if we don't have to deal with them today, those are still future issues. So I think we can sort out or separate some of the uncer-- I think a lot of what was pointed out are uncertainties in the data. I'm not sure we're going to resolve the uncertainties. It's only a matter of how are you going to address those uncertainties in the dose reconstruction. So...

I mean the other question would be if we wanted to narrow the numbers even more, how many of those 107 are SEC-compensable tumors, so that there may be a smaller number. And if you start on those, those would give us a -- a -- you know, a better handle on -- on where we -- Yeah, that's why I -- that's why I gave you the lead yesterday, Larry, to go back and ask.

MR. ELLIOTT: Let me see if I have that particular data point for you.

DR. ANDERSON: I want a (unintelligible).

MR. ELLIOTT: Well, I -- I don't have that particular number on how many would be SEC

cases. But what we typically see is a 60/40 split, 60 percent of the cases have cancer of the list of the 22, 40 percent don't. Is that right -- or is that backwards? No, that's right. But I can't -- from this -- from this e-mail I can't tell you what the exact case number would be.

DR. ZIEMER: Liz?

MS. HOMOKI-TITUS: I've just been asked to clarify on the question of bringing cases before you that haven't been adjudicated by the Department of Labor. It has -- the Board has always followed the policy when you've chosen your cases for dose reconstruction that you won't look at cases that haven't been adjudicated by the Department of Labor because the Department of Labor process could change those cases. They could be sent back as incomplete, they need more research, there's new cancers. So I just wanted to give an explanation as to the underlying reason -- not so much for you all, but for the audience as to why you wait for cases to be completely adjudicated and finalized before the Board reviews them.

DR. MELIUS: Can I clarify?

DR. ZIEMER: Sure.

DR. MELIUS: I mean this was brought up at a meeting two months ago. There's a subsequent discussion with Larry Elliott about doing this. In that discussion I pointed out that we were not asking for complete data on individual cases and we didn't want to violate any legal issues involved. All we're asking to do is to go through -- through and show that it's going to be feasible, that the issues -- particular technical issues raised in a representative number of cases can be dealt with within the -- based on the information available. We're not asking to see individual case information. I think it's very possible for you to be able to do that and make a presentation to the Board that does not violate this issue if...

DR. ZIEMER: For example, could you do a group of cases and summarize them at --

DR. ANDERSON: Yeah, I --

DR. ZIEMER: We've done ten cases and here's what we found or something like that, without --

DR. ANDERSON: And how -- this is how we

addressed this issue, you know.

DR. ZIEMER: I think right now we're just asking -- you may not have a -- I don't think the Board is asking that we look at case so-and-so that worked there so many years and, you know, that -- information that would identify who it is. But perhaps -- give that some thought, can it be done in a summary form. Mark, you follow-up on that?

MR. GRIFFON: Yeah, just -- just to fol-- follow up on that, I mean I was just thinking back to a meeting probably several years ago now in Santa Fe where -- where Jim, you presented some sample DRs for --

MR. ELLIOTT: De-identified.

MR. GRIFFON: De-identified, right.

DR. ZIEMER: Yeah, it was the low-hanging fruit cases.

MR. GRIFFON: Right, the Bethlehem Steel and several others --

MR. ELLIOTT: But they'd already been adjudicated.

MR. GRIFFON: They had been adjudicated?

MR. ELLIOTT: Yeah, we've been operating under that direction --

DR. ZIEMER: I guess that's right.
MR. ELLIOTT: -- not only from --
MR. GRIFFON: I thought they were --
MR. ELLIOTT: -- our general counsel but DOL's general counsel --
MR. GRIFFON: All right.
MR. ELLIOTT: -- from the very start --
DR. ZIEMER: Right.
MR. ELLIOTT: -- that when we bring anything in front of this Board for your audit and your review, that as a case it has to be an adjudicated case.
DR. ZIEMER: Okay.
MR. ELLIOTT: And we thought long and hard about this, Dr. Melius. We thought what can we bring to you that would explain how we would validate the data, how we would use the data in dose reconstructions and answer some of the questions that were on the table from Cedar Rapids. That's what Jim attempted to do this morning in his presentation, without violating this mandate that we have that we cannot bring example cases that have not been adjudicated. In two months' time we couldn't have brought you adjudicated cases for -- as examples.

DR. ZIEMER: Let's move on. Wanda.

MS. MUNN: Well, there's a lot to say about this. Everybody sitting at this table certainly knows we're not ever going to have perfect information. There are always going to be data gaps. Whether or not they're data gaps that we can live with is another issue, I guess. But the data gaps that I personally have heard here are not that egregious. Quite to the contrary, it seems to me that there's been an exceptional effort expended to gather and to analyze as much information as possible about the exposures of the workers in this proposed class.

I see the decision that we need to make today as being a watershed decision, for more reasons than one, not the least of which is that, based on recent correspondence that I've seen, it appears to me that even some Congressional perception of what has occurred in prior decisions that we've made is either an incorrect perception or it, at the very least, does not match my memory of what transpired in these meetings. It seems very important that we be particularly cautious in how we approach

this special cohort.
It also appears to me that the detail and availability of the data that we have here shows very clearly that there was considerable concern for the workers' safety and welfare by both the contractor and by the governmental agency that was overseeing the work at Mallinckrodt at that time. The fact that we have separate bases of data on which to rely when we start attempting to determine probability of causation is really important, I believe.
If we do not accept that it is possible for our agencies to do what they say they can do, then I don't see that we leave ourselves any options. There's no reason that I can imagine why our subcommittee cannot give some very specific direction as to what we consider to be priorities, and why our -- the Board's subcontractor and -- and NIOSH cannot come to some agreement on the major issues that we would like to see resolved at the same time that effort is ongoing with respect to resolution of some of these outstanding cases.
As I understand it, however, nothing can be

done on these outstanding cases until we have made a decision with respect to the SEC. Is that correct, or am I incorrect?

DR. ZIEMER: I don't believe there's anything that requires the dose reconstruction process to come to a halt while the petition's in process, unless they do it from a practical point of view. But there's nothing in the law that would say that you can't continue to process, is there?

DR. NETON: No, there is not, but we would -- I think we would be limited on the number of cases we could do until we -- we came to some conclusion on the SE-- SCA-- SC&A report. I mean they raised some issue which we believe we can address -- I mean we just have seen this report Friday, but a number of their issues, you know, we need to take into consideration, but they are not insurmountable, in our opinion.

DR. WADE: But there is a sub-set of the 107 that you could begin to work on now.

DR. NETON: A sub-set of the 107, that's correct.

DR. ZIEMER: And let me point out to the Board

that a delay has a -- the same effect as denying the petition --

MS. MUNN: Yeah.

DR. ZIEMER: -- from a practical point of view. It means that -- or -- denying the petition or supporting the NIOSH recommendation has the same effect because it -- it says in the meantime we will proceed with the dose reconstruction process.

MS. MUNN: Yes.

DR. ZIEMER: That is the practical effect of it. To the extent they can do that and still address the other issues that the Board is demanding be done, but -- theoretically, at least.

MS. MUNN: So that being the case, and with the very clear understanding that denying an SEC petition does not mean denying the claims, quite to the contrary, the vast majority of the claims probably -- given what I believe will occur, on the basis of the information that's available for these claimants -- will probably turn out very much the way the percentages have fallen in other categories, as well.

So it seems clear to me that we need to make a

decision today. I am prepared to make a motion if the Board is prepared to receive it.

DR. ZIEMER: Let me ask if there's additional discussion, just in general, before we put a motion on the floor. I'd be glad to --

MR. ESPINOSA: I have a question.

DR. ZIEMER: Yeah, a question here and then Jim has a comment. Okay. Yes.

MR. ESPINOSA: As far as adjudicated claims, is there any way that it could be brought to the Board in an Executive Session rather than -- I guess the question would be towards Liz or Larry.

DR. ZIEMER: Completed claims --

MR. ESPINOSA: Not --

DR. ZIEMER: -- individual claims from Mallinckrodt?

MR. ESPINOSA: The individual claims from Mallinckrodt that -- you know, I understand that none of them are adjudicated yet, but is there any way that they could be brought to the Board for examples like Dr. Melius is asking about to --

MS. HOMOKI-TITUS: I don't think the problem is the privacy information. I think the problem

is that you're not an appeals board and it would turn you into an appeals board. You're an advisory board.

MR. ESPINOSA: Okay, understood.

MS. HOMOKI-TITUS: So if you make comments on an unadjudicated case, it becomes part of the record. DOL hasn't dealt with it, so it's not really the privacy that we're protecting 'cause we would --

MR. ESPINOSA: Understood.

MS. HOMOKI-TITUS: -- protect that anyway.

DR. ZIEMER: Okay. Jim?

DR. MELIUS: I think we should come back to that issue later 'cause I think we need to resolve how we're going to review SEC evaluations, and I -- I respectfully disagree with sort of these I think are overly-broad conclusions that I -- terms of what we're asking for and what could be done to satisfy that. However, I think that we still have to wrestle with issues related to our contractor doing SEC evaluation -- evaluations, I believe they're called, and I think that -- best be done in -- in that context. And whether we set up a workgroup or work with a subcommittee to

resolve this, I -- I just think it's imperative that we come up with a better way of working -- of eval-- for NIOSH to evaluate SEC petitions and -- in order for the Board to be able to deal with these in a -- a better fashion and a more efficient process, but I think we can put that off for here.

In respect to Wanda's comments, I think there's one exception, at least in my mind, that's not been resolved yet in terms of the -- Mallinckrodt, and that is the Building 6 workers and that -- I believe that a resolution of the SC&A comments on the site profile would also allow us -- at least it would allow me to be more comfortable about making a decision about the S-- about the Building 6 workers and whether there's adequate information available to be able to do individual dose reconstructions on them.

Therefore, I would prefer that we postpone a decision on the Mallinckrodt petition until we have resolved that particular issue. I don't believe it's possible to do that at this meeting. I think we do need time for NIOSH to evaluate the SC&A report. And frankly, I think

we need to give time for the petitioners to evaluate the SC&A report in order to be fair to them.

DR. ZIEMER: Jim, could I ask you for clarity -- in your -- your comments about the Building 6 workers, are you viewing them, for example, in the manner in which I talked about earlier, as a possible sub-set of this cohort that might have eligibility status on its own right?

DR. MELIUS: Correct.

DR. ZIEMER: I this case identified in a much more clear way than say raffinate workers, per se.

DR. MELIUS: Yeah, I'm using Building 6 as a --

DR. ZIEMER: Building 6 --

DR. MELIUS: -- as a way to refer -- I guess -- whether you call it a sub-class, I'm not sure what the right terminology is, but certainly something the petitioners have raised. I -- at least I personally still have doubts about the adequacy -- the information for them. Again, I believe that once NIOSH has had a chance to comment, when there's been some resolution on the SC&A evaluation of the site profile, I believe we'll be able to come to a conclusion

on that.

DR. ZIEMER: Okay. And then Denise again.

MS. BROCK: Yes, thank you. I really appreciate that, Dr. Melius, and I would appreciate the time to do that because, as we said, NIOSH nor myself has actually had the opportunity to actually take all of that in. And for the record and for clarification, I want to make sure that I understand. The halting of the decision will not halt the dose reconstructions, and I -- I understand that you call that the low-hanging fruit. I'm assuming that's your underestimate --

DR. ZIEMER: Well, I don't know if it's still low-hanging fruit. The low-hanging fruit may be gone. They're reaching --

MS. BROCK: Picked through all those.

DR. ZIEMER: -- very high these days.

MR. ELLIOTT: Let me answer that. Yes, it's been pointed out to me that I need to make a point of clarification here. Up until this point in time, from I believe back before February even when we first started the evaluation report on this particular class, we suspended work on Mallinckrodt claims from

Destrehan Street only, unless there was a situation in a particular claim that allowed us to move forward like one of the efficiency measures would afford us. So just to make sure that everybody's working on the same page here, we have not been doing Mallinckrodt claims unless they were of the sort or of the type of claim that could be conducted under the efficiency process.

However, depending upon what the outcome of this Board's deliberation is today, we're ready to proceed --

DR. ZIEMER: Thank you.

MR. ELLIOTT: -- with dose reconstruction.

DR. MELIUS: Can I just follow up on that?

DR. ZIEMER: Sure, Jim and then Denise.

DR. MELIUS: I think this clarifies Denise's question, I hope. Say this committee or a subcommittee, I'm not sure (unintelligible) subcommittee of the Board, comes up with a list of whatever it is, six issues, key, priority issues from the SC&A evaluation of the site profile that need to be resolved, you need a chance to comment on those and try to resolve the issues with S-- SC&A. Work on those

particular issues relevant to individual dose reconstructions would be on hold for 30 days, until that meeting -- until that resolution took place.

Other aspects of those individual dose reconstructions you could have dose reconstructors working on, so those cases would be moving forward, except for those particular issues. Once those issues got resolved, then the -- the dose re-- individual dose reconstructions would be completed 'cause you'd have a, you know, pathway for doing that, so to speak, and -- and you'd be able to do it. So it wouldn't completely halt all individual dose reconstructions. You would be able to start forward -- you wouldn't be able to complete any that had -- where those issues were relevant to -- and -- and --

MR. ELLIOTT: You have accur--

DR. MELIUS: -- but you'd be making progress.

MR. ELLIOTT: You have accurately portrayed what I've been trying to communicate for several minutes here, but yes, we would -- we would proceed along those lines. What -- what has changed? Well, what has changed is we have

a set of comments that I'm very appreciative of from Sanford Cohen & Associates. We had a good discussion this morning. I wish you all would have been here because it was a good scientific dialogue that occurred. I think from that dialogue we recognized quickly what things do need to change and we're ready perhaps to make those changes.

The statute calls for individual dose reconstructions. In the -- in the sense of Congress, I believe they understood there was going to be a requirement here for individual dose reconstructions, given the data at hand or the lack of data at hand. And in this -- in this case at Mallinckrodt where we have specific claims that we could move forward given what we know now are the comments on the site profile and the issues that have been raised about that, we can move forward on those claims where we can. And those that -- claims that have remaining issues yet to be resolved, we'll have to hold those until we get those resolutions put to -- to bed.

DR. ZIEMER: Okay. Henry?

DR. ANDERSON: Yeah, I mean I would agree with

Jim that it would be nice to see how the package is put together for an individual. On the other hand, what I'd also like to hear, you know, in the four-month period, is yes, we've actually constructed these; these are off being reviewed by DOL as opposed to what they are, rather than well, we're able to get through ten of them and we're working on the other ones still and then --

MR. ELLIOTT: Well, we can certainly give you that level --

DR. ANDERSON: Yeah, I mean that would be --

MR. ELLIOTT: -- of information. We can't --

DR. ANDERSON: -- a minimum. I'd rather have so how did you address this -- you know, how did -- how did you reconstruct based on -- on a certain principle --

MR. ELLIOTT: We can present --

DR. ANDERSON: -- yeah.

MR. ELLIOTT: -- like Jim did this morning, we can present about issues and provide examples of how we've addressed those issues. We would send these -- the claims that we're working on, when I said --

DR. ANDERSON: Yeah.

MR. ELLIOTT: -- we'd hold some back 'cause we have to resolve issues, we would do that, but we would do that with the intent of working through those issues and moving those dose reconstructions out as soon as possible.

DR. ANDERSON: Yeah.

MR. ELLIOTT: The ones that we can move out, the dose reconstructions that we complete given the information at hand, we would do so. We would turn those reconstructed doses over to the claimant and get their input on them so that they'd -- they're going to know what --

DR. ANDERSON: Yeah.

MR. ELLIOTT: -- where they fall. We'll go through the regular process that we've gone through with all of our other dose reconstructions, and then we would --

DR. ANDERSON: Yeah.

MR. ELLIOTT: -- we would be ready to come into the Board room and talk specifically about how we've handled issues.

DR. ANDERSON: Yeah.

DR. ZIEMER: Okay.

DR. ANDERSON: That's -- that's really -- what I really want is -- is to get these -- these

moving, that if -- one, that we were to deny this and then a year from now hear that of these 107, 105 haven't been addressed yet, and then we're in a much tighter bind than if they say they're actually able to do it and they've done it and -- and here's the process. I'd be much more comfortable then at that point of saying well, clearly they can do it rather than we think we can do it.

MS. MUNN: But Henry, they've already told us they can do it. They've said we can do it. There are issues with respect to the TBD that need to be worked out, but they've already said they can do these cases. And if they can do these cases, then there is no reason for a Special Exposure Cohort.

DR. ANDERSON: The way I look at it is I can tell you I can run a four-minute mile. And you know, you say boy, I don't know if you can run a four-minute mile. And unless I --

MS. MUNN: Oh, yeah, I know, you can run a four-minute mile.

DR. ANDERSON: Well, I used to run a four-minute mile. That was a long time --

MS. MUNN: You're just saying that --

DR. ANDERSON: Part -- part of the issue is these are very complex things. And to this date and after five years, apparently none have been done. So they can't be an easy task. I mean 8,000 have been completed elsewhere and these have not. So not one has gone through the complete process. So you can say you can get to the -- we can fly to Mars, but if you say we want to do it within three years, then we have to look at the other options. That's --

MS. MUNN: But a part --

DR. ANDERSON: -- (unintelligible) plan.

MS. MUNN: Part of the reason they haven't been done is because we said wait until we look at this other stuff. You know, we're -- we're a part of the reason why some of these haven't been done.

DR. ANDERSON: I mean I would disagree. I would say we heard from Jim that there's a lot of individual data and that in fact the site profiles may not be that relevant or useful or needed in order to complete individual dose reconstructions. And you know, I can understand if people moved to another facility

--

MS. MUNN: Well, true.

DR. ANDERSON: -- that's another issue. But if you can do the dose reconstruction, why hasn't it occurred? And I --

DR. ZIEMER: Okay --

DR. ANDERSON: -- you know, you can say it's because of the --

DR. ZIEMER: Right.

DR. ANDERSON: -- the site profile --

DR. ZIEMER: Henry's --

DR. ANDERSON: -- but I just don't think, you know, we can wait --

DR. ZIEMER: Henry is --

MS. MUNN: He asked for more.

DR. ZIEMER: Yes, it's back to your -- the old adage about the proof is in the pudding. Right? Denise, you're --

MS. BROCK: That would be my comment, exactly. And I'm not saying that anybody's lying or being dishonest. I'm just saying that there are differences of opinions. SC&A was hired to audit this site profile. By Larry's own admission, a lot of these dose reconstructions have been put on hold. I'll tell you what's

been dose reconstructed. Lung cancers because those are easy pays. You can do an underestimate and those are going to hit. You do an overestimate on a prostate cancer, it's done. But other things like non-metabolics and other cancers that are still sitting there are still sitting there, and if they couldn't be done yesterday I don't know why they're going to be done next week. And what happens when we come back and -- and I'm still confused on the month/three month thing. When we come back and those aren't done or if there are some that are able to be done now, is there a maximizing dose being used? And what happens when you have somebody being denied? I'm just -- I'm perplexed at this and I agree with Dr. Anderson.

DR. ZIEMER: Thank you. Larry.

MR. ELLIOTT: The proof is in the pudding. It is. And I could run a four-minute mile when I was 21, but I can't do it today. And this is --

DR. ZIEMER: Well, I can claim the same thing, but who's going to --

MR. ELLIOTT: This is a -- oh, I have a --

MR. GRIFFON: There's a lot --
MR. ELLIOTT: -- ribbon that says --
MR. GRIFFON: There's an awful lot of Jim Ryuns around this committee.
MR. ELLIOTT: I have a ribbon that says I did it, but --
DR. MELIUS: We're going to have a road race later tonight. However, the --
MR. ELLIOTT: As long as Griffon's not in on it.
DR. ZIEMER: Okay, I think we're getting punchy here, let's --
DR. MELIUS: The results can't be released until DOL adjudicates those, so --
DR. ZIEMER: Okay, go ahead, Larry.
MR. ELLIOTT: Two things -- two things happened that had us put Mallinckrodt claims on hold that were not reconstructible -- or not easily reconstructible for us, they're -- where we -- where we couldn't use our efficiency approaches. Those two things were we were awaiting this revision -- this revision of the site profile to be reviewed and we wanted those comments so that we could move forward and not have to redo a bunch of claims.

The second thing was this petition. We didn't want to go through a bunch of dose reconstructions if this petition was found to be approved for a class. So we've been anxiously awaiting for this --

DR. ZIEMER: Okay.

MR. ELLIOTT: -- over three meetings wanting to know which way it's going to fall so that we can move forward on these claims.

DR. ZIEMER: Right.

MR. ELLIOTT: As you know, I have limited resources and staff to put to bear on these problems. And unfortunately, until we have a clear understanding of what's going to happen with Mallinckrodt Destrehan Street, we devoted our -- and focused our dose reconstruction attentions to other sites, except when we got a claim in that could be done from Mallinckrodt under an overestimating or an underestimating approach. Denise is totally accurate.

DR. ZIEMER: Right.

MR. ELLIOTT: The only ones we've completed in those 75 -- you can -- you can look at them, they're all lung or they're all prostate.

DR. ZIEMER: Thank you. Now I know that Wanda

is anxious to make a motion, and Jim is wiggling around like he wants to make a motion, but I think I'm going to have us all make a motion here. We're going to take a break and then we'll have time for motions.

MS. MUNN: Very good.

DR. MELIUS: It's also why I was wiggling around.

DR. ZIEMER: And Mike, we'll be back in about 15 minutes.

MR. GIBSON: Okay, I'll call back.

(Whereupon, a recess was taken from 3:10 p.m. to 3:30 p.m.)

DR. ZIEMER: Thank you for your patience, everyone. We're ready to reconvene. I want to check and see if Mike Gibson is still with us. Mike, are you on the line?

(No response)

DR. ZIEMER: Let's see -- Cori, can you check to see if Mike is on the --

MS. HOMER: He's not on the line. We're trying to reach him.

DR. ZIEMER: Okay, thank you. Mr. Owens has requested that we be reminded of the requirements of the SEC legislation, and Dr.

Wade is going to read the appropriate parts from the *Federal Register* for us.

DR. WADE: Right, I'm reading from 42 CFR Part 83, Procedures for Designating Classes of Employees as Members of the Special Exposure Cohort Under the Energy Employees Occupational Illness Compensation Program Act of 2000, the Final Rule. I'm reading 83.15, How the Board will Consider and Advise the Secretary on a Petition. I'm assuming that's what you would like read.

(Reading) 83.15(a), NIOSH will publish a notice in the *Federal Register* providing notice of a Board meeting at which a petition will be considered and summarizing the petition to be considered by the Board at the meeting, and the findings of NIOSH from evaluating the petition. (b), the Board will consider the petition and the NIOSH evaluation report at the meeting, to which petitioners will be invited to present views and information on the petition and the NIOSH evaluation findings.

In considering the petition both NIOSH and members of the Board will take all steps necessary to prevent the disclosure of

information of a personal nature concerning the petitioners or others where disclosure would constitute a clearly unwarranted invasion of personal privacy.

(c), in considering the petition the Board may obtain and consider additional information not addressed in the petition or the initial NIOSH evaluation report.

(d), NIOSH may decide to further evaluate the petition upon the request of the Board. If NIOSH conducts further evaluation, it will report new findings to the Board and the petitioners.

(e), upon the completion of the NIOSH evaluations and the deliberations of the Board concerning a petition, the Board will develop and transmit to the Secretary a report containing its recommendations. The Board's report will include the following: (1), the identification and inclusion of the relevant petition; (2), the definition of the class of employees covered by the recommendation; (3), a recommendation as to whether or not the Secretary should designate the class as an addition to the Cohort; and (4), the relevant

criteria under 83.13(c), and findings and information upon which the recommendation is based, including NIOSH's evaluation reports, the information provided by the petitioners and any other information considered by the Board, and the deliberations of the Board.

Let me quickly read from 83.13(c), since it's referred and I think it's relevant to what you are asking.

And now I'm reading from 83.13(c), (reading) NIOSH will evaluate records and information collected to make the following determinations: (1), it is feasible to estimate the level of radiation doses of individual members of the class with sufficient accuracy? (Punctuation read) (i), radiation doses can be estimated with sufficient accuracy if NIOSH has established that it has access to sufficient information to establish the maximum radiation dose for every type of cancer for which radiation doses are reconstructed that could have been occurred (sic) in plausible circumstances by any member of the class, or if NIOSH has established that it has access to sufficient information to estimate radiation

doses of members of the class more precisely than an estimate of the maximum radiation dose. NIOSH must also determine that it has information regarding monitoring source, source term or process from the site where the employees worked to serve as the basis for a dose reconstruction. This basis requirement does not limit NIOSH to using only or preliminarily (sic) information from the site where employees worked, but a dose reconstruction must, as a starting point, be based on some information from the site where the employees worked.

I think that covers the relevant portions now.

DR. ZIEMER: Thank you very much. Counsel has some additional comments here.

MS. HOMOKI-TITUS: Did that say "preliminarily" or "primarily"?

DR. ZIEMER: I think it was "primarily," but he may have said "preliminarily."

DR. WADE: It says "primarily." I misspoke. Thank you. Primarily.

MS. HOMOKI-TITUS: I know that too well.

DR. ZIEMER: A question, Denise?

MS. BROCK: Yes, just one more, sorry. At the

30-day meeting or any other proceedings relevant to Mallinckrodt, as a petitioner I would like for the record to be noted that I'd like to be notified so that I can attend these meetings.

DR. ZIEMER: What meetings?

DR. WADE: Any other meetings that take place regarding the SEC petition.

DR. ZIEMER: Thank you. Thank you. The Chair now recognizes Wanda Munn for purposes of making a motion.

MS. MUNN: Based on the information that we have received during this meeting, and upon the assurance of NIOSH that it is feasible for them to complete dose reconstructions on employees of the Mallinckrodt Chemical -- what is their correct name -- Mallinckrodt facility -- Mallinckrodt Works, yes -- from the -- let me start over again.

Based on the information that we have received in this meeting, and on the assurance of NIOSH that it is possible for them to complete adequately a dose reconstruction for workers of the Mallinckrodt -- of the Uranium Division of Mallinckrodt Chemical Works from the years 1949

through 1957, I move that the SEC petition 00012-1 and 2, sections 2, covering all DOE, DOE contractors or subcontractors, or AWE facilities who worked in the Uranium Division at the Mallinckrodt Destrehan Street facility during the period from 1949 through 1957 be denied.

DR. ZIEMER: Okay, you've heard the motion. The Chair's going to interpret that you have meant that we would recommend to the Secretary that it be --

MS. MUNN: Yes.

DR. ZIEMER: -- denied.

MS. MUNN: That was my intent.

DR. ZIEMER: Is there a second?

MR. PRESLEY: Second.

DR. ZIEMER: The motion has been seconded. It is now on the floor for discussion.

MR. GIBSON: (By telephone) Dr. Ziemer, could I ask who seconded the motion?

DR. ZIEMER: Seconded by Mr. Presley.

MR. GIBSON: Okay.

DR. ZIEMER: Jim Melius.

DR. MELIUS: Yeah, based on my earlier comments, I would move to table the motion.

DR. ZIEMER: There's a motion to table. Motion to table is not discussable (sic). Is there a second, however?

MR. GIBSON: I would --

DR. ZIEMER: It's seconded.

MR. GIBSON: I would second that.

DR. ZIEMER: It's been seconded. We must vote immediately on tabling. Tabling requires a two-thirds vote. All those in favor of tabling -- and let me -- let me -- this is information. The motion's not debatable. If the motion carries, it has the effect of postponing until the Board removes it from the table, which may be at a subsequent meeting. It's not been designated. If the motion carries, the Board -- or the Chair will entertain a subsequent motion that would contain, hopefully, instructions on what NIOSH and the contractor are to do in the meantime, and that motion could come later in the meeting.

All those who favor tabling this motion, please raise your right hand. Now I'll call for a voice vote from Mike -- one, two, three, four, five, six, seven, eight -- and Mike?

MR. GIBSON: Table the motion. I vote to table

the motion.

DR. ZIEMER: Vote to table. Then the Chair declares that the motion has carried, and the -- the motion to recommend that the petition be denied has been tabled, which has the effect of postponing action until the -- until the item is removed from the table.

Okay. In essence, that then completes the Mallinckrodt action for today. However, the Chair indicated that we would entertain a motion that would have some instructions as to what our contractor and what NIOSH should do. And I might add that it's not necessary that we make this motion at this moment if -- if the Board wishes to give some thought, or even have the subcommittee itemize some priority items of the type we said -- talked about before. Now Jim.

DR. MELIUS: Yeah, I'd like to first start, rather than with a motion, with some discussion as to how we can -- can best proceed, and to proceed as efficiently as possible I think is important for the petitioners and also I think to be cognizant of the amount of time and resources that have already been spent in -- on

-- on this issue and try to resolve it as readily as possible. And so I -- so I guess the question is what is -- the first thing I think we need to do is specify the particular -- as much as we can, based on what we've heard from SC&A and from NIOSH on what -- what particular -- how -- prioritizing SC&A's comments on the site profile so that NIOSH pays particular attention to those. And I guess the question I would raise to the Board is do we want to do that as part of our subcommittee's function, since the subcommittee initially started that this morning and I think that may be best, or we can do it as the full Board. But I'm comfortable either way, so -- you know, frankly, I wasn't at the subcommittee meeting, so I would -- I had missed out on some of that discussion, so --

DR. ZIEMER: Yes, and let me point out that during the subcommittee meeting there were a number of items identified -- I think five perhaps -- that were perhaps the priority items, but those would need the blessing of the full Board at some point. But -- and we do have scheduled a subcommittee meeting this

evening, and the Chair's going to propose that -- that we move to the subcommittee meeting fairly soon, like by 4:00 o'clock or something, because we had allowed until 5:00 for work on the petition, but since we're now ahead of schedule we could have the subcommittee work on that yet this afternoon and -- and formulate a recommendation to the full Board for action tomorrow.

DR. MELIUS: And then I would propose, based on that, report and action from the subcommittee that we could then introduce a motion tomorrow as to what needs to be done to resolve this issue, what would the next steps be and do that relevant to the petition, also.

DR. ZIEMER: We may also wish to talk about when -- when we might meet again. It might be important for us to have a meeting soon to learn the status of the 30-day work, if that's what -- if that's the direction we go. We may not be ready with the -- the report on how dose reconstructions are going, but at least -- may-- maybe a meeting sooner than we would otherwise have met.

DR. WADE: Right. I mean in my role as DFO,

given what I've heard this morning, I -- I would think we need to be prepared to meet in August, very soon after the 30-day clock would tick down --

DR. ZIEMER: Mid to late August, perhaps.

DR. WADE: -- to address this issue. So I'd ask you to begin to think about that. I do think it's important that we deal with this in a -- in a timely way.

DR. MELIUS: Yeah, could -- could I request that the subcommittee then, as part of developing this list of priority issues, then have discussions with NIOSH and SC&A so we're -- we're sure that it is feasible to resolve it, whether it's 30 days or 40 days or whatever, so that we don't -- I think it would be a mistake to have a premature -- a meeting before things are adequately resolved, but at the same time I don't think we want to delay --

DR. ZIEMER: I think it would be appropriate to do that, and if -- if perhaps someone from SC&A and from NIOSH could join us for the subcommittee meeting shortly and -- and we can identify those things and bring them firmly to -- to the Board in the morning for formal

action, and -- and perhaps a vote of confidence, as it were, in the action.

DR. MELIUS: Okay.

MR. GIBSON: Dr. Ziemer?

DR. ZIEMER: Yes, Mike?

MR. GIBSON: I would like to also add and -- and again, I'm a little behind the 8-ball here since I wasn't able to attend, but I think we still have this issue on the table of dealing with the adequacy, the timeliness and the thoroughness of the information that is given to NIOSH to make these dose reconstructions that we -- we struggled with that caused a problem with the Iowa petition. And I think the subcommittee or the working group needs to put that on the agenda, also.

DR. ZIEMER: Yes.

MR. GIBSON: And secondly, if I could, I would like to make a motion that it's not NIOSH's fault, it's not SCA's fault, it's not our fault, but I would also like to make a motion -- just as we did in Idaho (sic) -- to draft a letter of regret to the petitioners and survivors of St. Louis plant for delaying this process even further.

DR. ZIEMER: I will interpret that as a motion. Are you asking that that be expressed verbally or that there be a formal letter?

MR. GIBSON: Yes, I'm asking for a motion from the Board. I'm asking for a motion and that the Board would agree to that, same as we did -- as in Idaho -- or, I'm sorry, Iowa.

DR. ZIEMER: Iowa? The motion is that there be a letter from the Board, I believe, to the petitioners --

MR. GIBSON: And survivors.

DR. ZIEMER: -- expressing -- and their -- and the survivors, expressing our regrets that this delay has had to occur. I believe that is the motion. Is there a second to that motion?

MR. OWENS: I second it, Dr. Ziemer.

DR. ZIEMER: Yes, Leon Owens has seconded the motion. Is there discussion on this motion? Wanda?

MS. MUNN: I hesitate to do that. I have no compunction at all about expressing verbally and in our minutes our -- our concern over further delay. But I don't know what this Board could have done to expedite this issue any further than we have, other than to ignore

the precision that we've asked for from our -- from our contractors and from our agencies. I don't know what else we could have done and I certainly hesitate -- as a matter of fact, I would be greatly averse to any move to back off from our request for thoroughness, and so therefore I would not support this motion.

DR. ZIEMER: Thank you. Leon?

MR. GIBSON: Could I --

MR. OWENS: I think --

DR. ZIEMER: Leon, Mike -- Leon is --

MR. GIBSON: Okay.

MR. OWENS: I don't think it is a retreat from any position that the Board has taken, but I do think that this Board -- since we serve at the pleasure of the President, and since this Board was created by the Congress, and since we have workers who have given their lives for our freedoms, I think the least that we can do is to send a letter of regret, as was done before. These folks that have been sitting here for the last couple of days, some of them are just as unfamiliar with this process as if we were to have a child in here. And they don't fully understand what's going on. The only thing

that they know is that they have been waiting for years, watching their loved ones die, to have claims paid. And so I do not feel that it is in any way an imposition for us to send a letter of regret.

DR. ZIEMER: Okay, so you speak for the motion. Others wish to speak for or against the motion?

MR. GIBSON: Dr. Ziemer, I'd like --

DR. ZIEMER: Yes, Mike, thank you.

MR. GIBSON: -- to respond to my -- with respect, to my colleague, Wanda. Again, I'm not blaming anyone, any organization, but you know, I just -- I think Leon pretty much represented what I said. We serve at the pleasure of the President. We have a duty and this is a cumbersome process. And given the facts that the issues that have taken place that are delaying this -- just like Leon said, there are people that are dying, there are people that need medical bills paid, and -- again, in Iowa my first motion was a letter of apology, and I chose -- you know, I chose a friendly motion to amend that to regret, and that's why I think we deserve the same for these people at Mallinckrodt.

DR. ZIEMER: Okay, thank you. Anyone else wish to speak? Anyone speaking against the motion? Anyone speaking for the motion?

MS. MUNN: I have one more comment.

DR. ZIEMER: Yes, Wanda.

MS. MUNN: I am in full accord with the intent and the sentiment involved here. But I would respectfully point out that all of the people who are ill and dying are not former employees of Mallinckrodt. We have multiple sites with multiple people who have similar kinds of concerns and similar kinds of pain. If we are to apologize, if we are to express our concerns, then it appears that we owe all people that apology, not simply the group with whom we are dealing right now. That's an unfortunate reality of what we're doing. But again, I repeat, it's a result of our desire for efficiency and our desire for as complete information as we can get.

DR. ZIEMER: Okay. I think Leon was next and then Rich.

MR. OWENS: I think as we go to the different site and as we're faced with circumstances similar to what we have now, the Mallinckrodt

workers have been waiting a long time for this Board to consider their SEC petition and there have been numerous delays. And I think everyone recognizes that those delays have not always been on the part of the Board or on NIOSH or on SC&A. So if we are faced with similar circumstances at these other sites, I would think that this Board would also consider a similar remedy, to send a letter of regret to those individuals.

DR. ZIEMER: Thank you. Richard?

MR. ESPINOSA: I'm in agreement with Leon. This is our third meeting discussing the SEC as well as the sixth month. I am in full agreement with the letter of regret.

DR. ZIEMER: Okay. Any others? Mike --

MR. GIBSON: Dr. Ziemer?

DR. ZIEMER: -- another comment? Yes, go ahead.

MR. GIBSON: If -- if my colleague, Ms. Munn, would agree, I would take her comments as a friendly motion that we make it a blanket statement to -- to every site, to -- to all of these petitions we deal with just -- I mean just to let them know that we are -- we have a

job to do, but we are somewhat limited by the whole political process. And if -- if she would be willing, I -- I would take a friendly amendment just to modify the motion to make it a blanket letter to each and every site or petition. Not saying it's, you know, right or wrong or every petition's going to be granted, but just that, you know, we regret we have to delay our decision sometimes based on the political process and not -- not blaming any governmental institution.

DR. ZIEMER: Thank you for that sentiment, Mike. I think the Chair is going to interpret that -- and I have this prerogative -- as a non-friendly amendment, only in the sense that I'm somewhat reluctant to think about writing to -- how many sites are we talking about, 900 sites or something. Yes, there are, or more -- I forget, but the number's not critical, Larry. That's -- there's more than a few sites. I -- I would -- I would hope -- you know, if this situation occurs, as Leon says, in the future, we can handle those as they come. I -- I'd certainly be more comfortable if we simply acted on this motion for this situation and

handle the others as -- if that's agreeable with you, Mike, I think we'll proceed on that basis --

MR. GIBSON: Well --

DR. ZIEMER: -- if I understand your sentiment.

MR. GIBSON: -- I'm sorry, I meant as they come up.

DR. ZIEMER: Yeah, I -- yeah.

MR. GIBSON: I didn't --

DR. ZIEMER: Oh, as they come up, yes. Henry, your comment?

DR. ANDERSON: I was only going to say I -- I think some type of communication would be useful because obviously the people who are here have heard it, but there are others that -- I'm not sure I would send a physical letter to all of them, but I think to put a letter up on the web site or something so people --

DR. ZIEMER: Well --

DR. ANDERSON: -- would have an explanation --

DR. ZIEMER: -- if the motion passes, the Chair will prepare a formal letter similar to what we did in Iowa and --

DR. ANDERSON: Yeah.

DR. ZIEMER: -- it would -- it'd basically go

to Denise and I think --

DR. ANDERSON: Yeah.

DR. ZIEMER: -- she would share that with --

DR. ANDERSON: Okay, that's --

DR. ZIEMER: -- with her colleagues. That would be what would happen.

Are you ready to vote on the motion? Okay, all in favor, say -- raise your right hand, let's just get a hand count -- one, two, three -- six.

And those opposed to the motion? And then the motion carries. So ordered and we will -- and Mike, that -- with your permission, I will word that somewhat analogous to what we did for the Iowa situation.

MR. GIBSON: Okay. Well, I would be willing to -- to help you with that if -- if you -- if necessary, but -- and for the record, obviously, I --

DR. ZIEMER: Well, you drafted the other one. I'll use that as a template, with --

MR. GIBSON: Okay.

DR. ZIEMER: Thank you. I'm proposing that the issue called policy issues related to SEC petitions be postponed until tomorrow so that

we can allow the working group to get underway here shortly. Is that agreeable? And that -- that will be a brief item tomorrow on our agenda.

MR. ESPINOSA: (Unintelligible) literature?

MR. GRIFFON: Can you at least --

DR. MELIUS: Could someone tell us what it is?

MR. GRIFFON: Yeah.

DR. ZIEMER: Well, I'm going to ask Lew to tell you what that is.

DR. WADE: Two things I wanted to do under that. One was to -- you had asked for information concerning the classified information issue, and -- and OGC was going to speak to that.

I also wanted to at least put on the table this issue of what we do about the non-covered cancers when we -- when we grant an SEC. I don't think we -- we have to resolve that, but I think we need to have that issue in front of us and have some discussion on that. We have time tomorrow afternoon for Board deliberation. I just wanted to frame the issue, which I've done, and I think we need to talk about it tomorrow afternoon.

DR. MELIUS: Okay. Mr. Chairman -- and would it be helpful, before the subcommittee meets, for us to try to work out a meeting time and -- for this next meeting that we're talking about? I mean I'm not sure which is -- you know, sort of which is better --

DR. ZIEMER: I would suggest we do that tomorrow, but if you -- if you prefer to do it today, we can --

DR. MELIUS: Well, I think we're all here. I'm just a little hesitant that -- that we start to lose people tomorrow afternoon and -- and also it might be sort of easier to...

DR. WADE: Well, let's take a shot -- last week in August, last full week in August, week that starts on the 22nd?

DR. ZIEMER: Okay, we'll go right around the table and check calendars here. Last week of August?

DR. WADE: Week that starts on the 22nd. I would propose the middle of that week, let's say the 23rd/24th.

DR. ZIEMER: Oh, the week that starts the 22nd?

DR. WADE: Right.

DR. MELIUS: That's fine with me.

DR. ZIEMER: I believe -- let me ask -- there's a counterpart group of ours that deals with the veterans, and Melanie, I'm going to ask you to remind me when your group meets, because I'm supposed to be there for that meeting. Is it the 24th of August?

MS. HEISTER: No, that is the 17th and 18th.

DR. ZIEMER: 17th of August. All right -- yes. I thought I hadn't written it down, it is here. Okay.

DR. WADE: So the 23rd and 24th, just let's go around. Wanda?

MS. MUNN: Yes.

DR. WADE: Leon?

MR. OWENS: Yes, sir.

DR. WADE: Roy?

DR. DEHART: Edinburgh.

DR. ZIEMER: He's out.

DR. WADE: Mark?

DR. ZIEMER: Roy's out.

MR. GRIFFON: I'm okay.

DR. WADE: Robert?

MR. PRESLEY: (Inaudible)

DR. ZIEMER: Rich?

MR. ESPINOSA: I'm having a little bit of

problems with -- is it going to be two days of -- two full days of meetings or --

DR. WADE: No, no, no, just a phone call. Oh, no, this is --

MR. GRIFFON: No, this is a --

DR. WADE: Yet to be determined.

MR. ESPINOSA: I'm looking at this Board agenda and it has a -- August for a conference call and you're -- you're talking about a face-to-face meeting for a full two days?

DR. WADE: I am talking about a face-to-face meeting, the length of which has to be determined I think by the issues in front of us, but I would say a minimum a day and a maximum of two days.

DR. ZIEMER: Might be a day and a half, though.

DR. WADE: Right.

MR. GRIFFON: I -- I would -- I'm clear.

DR. WADE: Mike?

MR. GIBSON: You're saying the 22nd or 23rd of August?

DR. ZIEMER: 23rd and 4th.

MR. GIBSON: Yes, I could do it.

DR. ZIEMER: 23rd and 4th.

DR. WADE: Yes?

MR. GIBSON: Yes.
DR. WADE: Okay, so we have Dr. DeHart not available and Richard questionable.
MR. ESPINOSA: I'm questionable. I can make -- the problem is I have something on the 22nd, which would be my travel day, so it's questionable I -- if I can make it for the full two days.
DR. WADE: Okay. Let's consider that then tentatively set. We do have to define the issues and we have to hear from NIOSH and SC&A as to the feasibility of this, but now we have -- we've put a mark in the sand for the days of the 23rd and 24th of August for the Board to get together to deal with the issues of the Mallinckrodt site profile.
MR. PRESLEY: (Off microphone) Do we want to do that in Cincinnati (unintelligible) everybody?
DR. ZIEMER: Do what?
MR. PRESLEY: Do it in Cincinnati where we've got all their resources.
DR. WADE: Okay, the proposal is Cincinnati. It's in -- it's sort of in the middle of the country.
DR. MELIUS: So is in St. Louis. I mean I --

if we're going to do Mallinckrodt, I mean I -- that's the main focus, I think Mallinckrodt has some --

DR. WADE: Well, we have to do some work in terms of hotels.

DR. MELIUS: Yeah, I --

DR. WADE: Let us start that. We have enough now to begin the process. I think it's appropriate to move on with the subcommittee deliberations.

DR. ZIEMER: Okay.

DR. MELIUS: Do we have another meeting, I guess is the -- are we going to try to do another meeting time after that or are we --

DR. WADE: Well, we will -- we'll do that tomorrow.

DR. WADE: This, in essence, would replace the telephone meeting we scheduled for August, I believe.

DR. WADE: Right, and Cori has calendars on -- no, we're looking at late September, early October for the next meeting. I think we'll continue with that.

MR. PRESLEY: We were asked to hold our dates in September.

MS. MUNN: 27th through --
MR. PRESLEY: Right, we were asked to hold the 27th --
DR. ZIEMER: Week of the 26th was the --
DR. WADE: At this point I wouldn't change that.
MR. GRIFFON: Yeah, better hang onto those.
DR. WADE: We have an awful lot to do. We have SECs coming up that have qualified in a time that we'll need to get together late September, early October.
DR. MELIUS: For the record, I'm not available then now. I've got a sub-- you sent out a subsequent correspondence saying the meeting was going to be moved, and I don't...
DR. WADE: We'll work on that tomorrow.
DR. ZIEMER: Thank you. Other comments on that?
Okay, then we're -- we're going to begin the subcommittee meeting at 4:15. We'll take a break. Subcommittee then will reconvene at 4:15.
MR. GIBSON: Dr. Ziemer?
DR. ZIEMER: Yes, Mike?
MR. GIBSON: Could I ask Dr. Wade to give me a

call at home?

DR. ZIEMER: Yes.

MR. GIBSON: (Unintelligible) talk to him just for a second.

DR. ZIEMER: So noted.

DR. WADE: Okay, thank you.

DR. ROESSLER: Is there a restriction --

MR. GIBSON: Do you have my number?

DR. ZIEMER: Question?

DR. ROESSLER: Is there a restriction on the number of Board members that can attend the subcommittee meeting?

DR. ZIEMER: No. Thank you, we're recessed.

(Whereupon, the full Board concluded its meeting at 4:00 p.m.)

C E R T I F I C A T E OF COURT REPORTER

STATE OF GEORGIA

COUNTY OF FULTON

I, Steven Ray Green, Certified Merit Court Reporter, do hereby certify that I reported the above and foregoing on the day of July 6, 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 6th day of August, 2005.

_____

STEVEN RAY GREEN, CCR

CERTIFIED MERIT COURT REPORTER

CERTIFICATE NUMBER: A-2102