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PUBLIC HEALTH SERVICE
CENTERS FOR DISEASE CONTROL AND PREVENTION
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

convenes the

THIRTIETH 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 Crowne Plaza Five Seasons Hotel, Cedar Rapids, Iowa, on April 26, 2005.

C O N T E N T S

April 26, 2005

TRANSCRIPT LEGEND

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MR. BOB ANDERSON, PETITIONERS
DR. LAURENCE FUORTES, PETITIONERS

DR. JIM NETON, NIOSH
DR. ARJUN MAKHIJANI, SC&A

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P R O C E E D I N G S

(8:00 a.m.)

WELCOME AND OPENING COMMENTS

DR. ZIEMER: Good morning, everyone. I'm going to call the session to order. Thank you for being here today. We have before us a pretty busy agenda. I'd like to remind everyone, if you did not get a copy of the agenda or related materials, they are on a table toward the back there. Also be sure that you have registered your attendance if you haven't already done so. Let me call on Dr. Wade for just a few introductory remarks, as well.

DR. WADE: Thank you, Mr. Chairman, just -- just a few things to say. I thought yesterday afternoon we had a very good day. I thought there was -- there were significant issues discussed and a good discussion of the science. Again I remind the Board that creating a record of its deliberations, of its considerations, is terribly important to the support of any recommendations that it might make to the Secretary, and I would encourage you to do that.

I would be remiss if I didn't thank SC&A for their contribution. They were given a very

difficult task with regard to the Iowa TBD and they responded not only with excellence from a scientific point of view, but professionally I've always been impressed with their response. So I thank them for their efforts.

I also thank NIOSH for their efforts in bringing information to us to consider.

Again, remember the record is terribly important.

I would also ask you to think about how this Board would normally do business. We're going to discuss an SEC petition today. It's quite possible that the Board might come to an intellectual decision and then want some paperwork generated. And you know, what that gets us into is tomorrow, and that's fine, but at our last meeting in St. Louis we ran out of time and were losing a quorum at the end of the day. I would ask you to think about those things as you plan your deliberations. I think it is terribly important that you finish with excellence what you've started with excellence.

Thank you.

DR. ZIEMER: Thank you, Lew, for those remarks.

SC&A DISCUSSION CONTINUED FROM APRIL 25, '05

We have actually some unfinished material from yesterday. We terminated discussion of the SC&A report and the NIOSH report in order to accommodate the public comment period, and we still have some additional comments that SC&A wished to make for the record -- and perhaps NIOSH, as well -- pertaining to the Iowa site profile and petition. So I'm going to give the floor to John Mauro and he in turn can have his folks -- I think Hans perhaps has some comments first, but John, you want to --

DR. MAURO: (Off microphone) Yes, I'd like to (unintelligible) Hans Behling.

DR. ZIEMER: Okay. Hans Behling is going to approach the mike. Thank you. And make some additional comments on the SC&A report.

DR. BEHLING: Are we on? Yes. Good morning. My name is Hans Behling and I'm one of the SEC (sic) members who had the opportunity to review the Iowa TBD Rev. 1, and I'm here this morning just to add a few more comments to things that were presented to you yesterday, principally by Dr. John Mauro. And I want to start out basically by looking at the slide that you're at this point probably very familiar with, and

this is the slide that identifies the post-'63 monitoring data. You've seen it in other slides by other presenters, but this is the one that we have to work with so let me start out. It's -- in my opinion, this particular slide represents the single most important slide that characterizes the dose -- data that will be used for dose reconstruction.

I also should note that the lower portion of that slide that starts with the actual 1962 and '63 monitoring data was not included in Rev. 1. It was, however, included in Rev. 0, which we were not asked to look at. I happened to come across that slide almost serendipitously, and I'll briefly explain.

I was auditing a dose reconstruction report that was constructed with the TBD Rev. 0 as its principal document, and as a result of that dose -- dose reconstruction review process I came to note that this slide was actually very important, but unfortunately was not in the Rev. 1 TBD and as a result of that we did not really address it in our review of the TBD.

So let me go briefly and explain why it's important. It's not only important for the

data it contains, but it's probably equally important for the information that it does not contain. Let me go and briefly point out some of the things that are uncertain, at least in my mind. In this particular slide actually that information's not even here. It was presented in one of the other slides. I'd forgotten that the data was not here.

But in the other slide, in Table 8 -- and I believe that one of the Congressional staffers had -- or members had presented that slide -- it shows the number of total people who were potentially the people who may have been monitored but were not monitored. And I believe those numbers ran from 1962 in around 1,040 and then oscillated between 600 and 1,000 for the remainder of the year. And one of the first questions that I would ask is who were these people and what do they represent. Were they all of the workers at IAAP or were they people who were radiological or radiation worker types who should have been monitored. And that is a very important question. In general, you would like to know who your -- your denominator is, and in this case we don't

have that information. These are the numbers that I was hoping to identify, which unfortunately we did not have on our slide. As you see here -- yeah, as you see here, these are the numbers that are classified as moni-- workers who were not monitored, and -- and it's very important to understand who those people were. Was it in fact a population that includes secretaries, white collar workers, people worked behind a desk, or were those people who should have been monitored but were not monitored. So that's one of the chief -- chief questions that we should have an answer to.

As you can see, in the first few years only about five percent of the people were monitored, and that escalates to about 26 percent towards the end of the time frame that we have to concern ourselves with.

One of the things that -- or the second thing that needs to be answered is who are the people who were in fact monitored, and I think those numbers we do have, which is your second column. Obviously we can conclude that the number of monitors were quite a few -- I mean

were few in numbers. We start out with 29 of about 1,000 workers and it goes to 41 and so forth, and there is a significant leap in numbers between '67 and '68, but still only a fraction. Only 14 percent were monitored. And of course by the time you reach 1972, that fraction is raised to about 26 or so percent. What is important -- even more than realizing that the numbers of people who were monitored were small -- is the question of who were those people. And I believe we have to look at that more carefully than has been given time for. In one of the slides yesterday by Tim Taulbee, he presented us a pie chart that suggested that the number of people were segregated by worker categories. And one of the things that comes to my mind is that these workers represent a broad spectrum of workers, and not necessarily the most exposed group of individual. And I've done a lot of work in other areas that lets me to conclude that what we're looking at here is not a sub-population of workers who were most exposed, but a cross-section of workers who may have been exposed. And this comes under the heading of cohort badging.

This was very popular in the '60's and '50's when people were essentially assigned a badge through an individual, and that individual represented your exposure. In fact, if we look at some of the data that was identified by the National Research Council who wrote a report called "Film Badge Dosimetry in the Atmospheric Nuclear Testing," in 1989 that was published, they give data that says on average, during the Pacific testing of -- program in the Pacific, about one out of 100 people were only badged, meaning that 99 of the 100 were not badged. What I believe may have happened here is that we're not looking at -- for instance, in 1963 -- 41 individuals who were the most exposed people; that is, Line 1 workers. What may have happened is that there were groups of people who each were given a certain number of badges to understand what the spectrum of exposures may have been. In other words, if I had -- let's assume I have 100 people, and 100 people represents five distinct groups of individual, not all of them obviously working in the same kind of job or doing the kind of things that would expose them. And I only have, for those

100 people with -- representing five groups, ten badges. What I may do is give two badges to each member of the five groups and therefore allow those two badges to represent that group of 20.

What it does, in effect, is it does not necessary (sic) represent the most exposed population. You may have people who were modestly exposed. And when I look at that data, what I'm looking at may not be the most exposed population group at all. It may be a cross-section that represents different groups of workers. And when that information then is collated on the assumption that it does represent the most exposed population group, and in this case we have been led to believe that it is in fact the Line 1 worker, we may be looking at values that have been substantially reduced based on the averaging effect that cohort badging has as a built-in factor. And as I said, while the numbers of workers badged increases all the way to 312 at the end of 1972, the fact of the matter is, if that still represents cohort badging -- even though the numbers improve -- you are still looking at a

dilution effect that is built into the issue of cohort badging 'cause you're not looking at the most exposed population but a cross-section of all workers who may be exposed. And that's a very important and significant issue that needs to be addressed and I don't have the answer to that.

Let me also briefly talk about the last column, which identifies the doses. Those numbers are not the real numbers. In fact, those numbers represent what I had done in terms of manipulating the raw data which was presented in Table 7 of Rev. 1 and was also translated in some form or fashion into the Rev. 1 of the TBD. But they were amplified by what you heard yesterday were the photon dose correction factors which in essence amplified the recorded dose by a factor of about 2.26, which is then your new photon dose, and then that's also used as a way to establish what your neutron dose is by multiplying that value times .79 and 1.91 to establish what your neutron dose is. So what you're looking at obviously over here is a reconstructed or reconstituted dose.

I have a question about the original data of

how those numbers came to be. And let me explain briefly why. We know that the dosimeters that were in use at the time was a two-element film dosimeter. And if we can assume that it represented the other types of dosimeters that were used throughout the AEC at that time, it was probably an open window and a shielded one that has either a 1,000 milligram lead filter or a silver filter.

Now we all know, and it's fully acknowledged in the TBD, that those dosimeters had significant limitations with regard to the radiation fields that we were looking -- or are concerned about, namely low energy photons. And in this case, the principal photon in question, about 70 percent of the dose is due to americium 241, which has a 60 keV photon, very low energy, and it's not very readily capable of penetrating that 1,000 milligram filter in order to register a response.

The question I have is how was the original data deciphered. And to really answer that question, I need to also realize what were the basis on which these dosimeter readings were recorded, because they were not a constant.

When we raised that question in our review of the TBD, we -- we had concerns about the shielded component of the film dosimeter in being able to actually measure those low energy photons. And in response to that concern we were informally told that the approach taken by NIOSH in trying to actually make use of the monitoring data that you see here is that they used the open window, as well. And I don't know in what capacity, whether there was some kind of a algorithm or whether they used some kind of a formula. But the truth of the matter is that the dose, as it was recorded, has to be looked at very, very skeptically because we know for a fact that the method by which the AEC reported dosimeter data was quite variable, and I'm going to show you in the next two slides exactly what happened.

You can see in this slide here the various time periods by which information was recorded. You can see, for instance, in the very early period that the skin dose was the open window, plus -- and I can't really see where I'm standing from... -- oh, open window and silver. I believe S stands for silver and that is your --

your shield. It's a 1,000 milligram filter that sits over top. And of course your whole -- whole body was the silver, meaning that it was recording only the deep dose.

As you go down the line, you will see over the time the changes by which these infor-- this information was -- was made available. And as you can see down towards the end in -- in -- in the 1972 time frame, the skin dose was the non-penetrating dose plus the whole body, and the whole body was penetrating dose and -- and slow neutrons and fast neutrons and so forth.

What I'm telling you is that the way in which doses were recorded varied over time, which poses a significant problem in how you interpret that data. In fact, the next slide is something similar to that. And again, this comes from a -- from one of the records that I believe represents Hanford. And again you see the variations by which dosimeter data was recorded. And so until we have an understanding of how the actual dosimeter data that was used and you saw reported in the previous slide was deciphered, there's a significant question in my mind as to whether

or not the numbers that we started out with as a baseline really represents something that we agree with because of the variability by which recorded information was presented and is probably at this point available in the records.

So I'll quickly sum it up because I'm probably running out of time here. There are a number of questions that I believe need to be answered. And until these questions are answered, in my mind there is some uncertainty about the pedigree of the information that's being used for the post-'63 monitoring data. And to add another level of concern is that the 1963 post -- 1963 monitoring data, if there is some concern about the pedigree of that, we must also raise the question about how that affects the pre-1963 data because that information is deeply imbedded into the generic pit dose model.

So at this point I would leave you with some -- some -- some concerns about what I'm -- addressed here regards to the monitoring data. I have some serious questions and I believe some of those questions need to be answered in

order for us to have a little more faith in that data as a tool for dose reconstruction.

DR. ZIEMER: Thank you, Hans. If I may pose a quick question, either Hans or maybe Tim Taulbee can answer this, I got the idea from what I read that the badging at this facility was not AEC badging but was R.S. Landauer badging. Can -- and -- can -- can you answer that?

MR. TAULBEE: Yes, sir, you are correct. They were using Landauer badging. And a couple of I guess additions to what Dr. Behling was saying, when we made -- when we first began writing the initial TBD, we were not sure whether the Landauer film badge was a two-element badge or a four-element badge during the time period. After SC&A posed this question to us earlier this month, we began to try and do a lot of digging on this particular issue of low energy photon response, and we found they were using a four-element film badge that had an open window, a plastic window, an aluminum window and a lead/tin alloy. So we're quite confident that those dosimeter values were properly measured.

Our adjustment factors that we have in the Technical Basis Document are additional overestimates, because that design of the film badge -- it was the Landauer J badge -- would have accurately measured this. And this is a situation where as SC&A and I -- and NIOSH have not had a lot of time to try and work these types of issues out, and this is information that we really just haven't had time to go through the factual, you know, comparison, as Dr. Mauro had mentioned yesterday. And so what you're seeing here is some disagreement between what we're doing, and this is just because of time in the rush process.

DR. ZIEMER: Understood. And stay there just a moment, Tim. In the case of Landauer -- probably AEC, too -- it usually was pretty important that the film badge supplier knew what the nuclide or the principal photon was in order for their calibration in fact to be correct 'cause they were -- they did use algorithms for these four readings.

MR. TAULBEE: That's correct.

DR. ZIEMER: Do you know -- is there any evidence that in fact Landauer knew that

americium was the primary photon of interest?

MR. TAULBEE: The only -- we don't have direct evidence that Landauer did -- did know that. What we do have is that the health and safety department at Iowa would expose badges and send them to Landauer and that we have QA type of checks along those lines, but I don't know exactly how the health and safety group exposed them. I don't know if they held them next to pits or whether or not they were exposing them from radiography. I'm not sure which way it was.

DR. ZIEMER: And finally, has anyone actually looked at the Landauer archives, because they archived their readings for most clients.

MR. TAULBEE: What we've looked at is the Landauer dosimetry reports. Dr. Behling was talking about the -- you know, the total penetrating or whole body type of dose. We have it broken down on the Landauer dosimetry reports by beta exposure, X and gamma ray, as well as thermal neutrons and fast neutrons. So we have that broken down, but other than that, no, sir, we have not gone through it with Landauer.

DR. WADE: You have someone who wants to make a brief comment.

DR. ZIEMER: Is there a comment, sir?

UNIDENTIFIED: Yes, sir. If you could go back to that one chart, the original chart you had up on the film badge monitoring, please, that showed 1962 through '72, I believe it was. I'd like to explain some things to you on this film badge thing that they're talking about and how it worked.

On that particular chart -- go on back, ma'am; next one, go on back --

DR. WADE: This is the -- the longest numbers by year.

UNIDENTIFIED: Yeah.

DR. WADE: The first one you --

UNIDENTIFIED: Yes. Yes, sir, the very first one -- all right, that one right there. Oop, you just kicked her back there, darlin' -- run her back. All right.

Now if you look at '62 up to 1967, you'll notice the film badge numbers are low. From 1968 on you'll notice how the film badge numbers increased. What happened was in 1968 the push started. From 1968 to 1972 we built

14,000 warheads. That averaged out to 28 warheads a day. The people that you see starting in '62 and '63 that had film badges were the 1-100 X-ray people, some of the people in the 1-11 squash area, and some supervisors or foremans (sic) only. Then when the push started and we started having all of our alarms and monitor problems because of the radiation problems, they -- safety got all excited and started putting more film badges on people. That's why this increase is. This is when the problem started because we had so many units and the leakage from these units was setting off the monitors and setting off stuff and they couldn't get production out, and that's when they started tampering with the monitors. Now the film badge situation was at AX-1, the badge exchange. You had a double guard post there. The film badges was on a rack. The one door went to the 1-63, the 1-61, the 1-11 and the squash area. The other ramp went to the 1-13, the 12, the 10, the 1-100 areas like that. All right. They picked up their film badges there and brought them back and they were placed there. Now what we was trying to figure

out was how could they take the film badges, after the 4:00 to 12:00 shift got off, pick them up, take them to the lab and read them, and still punch out on time. This was confusing us. So what the guards did one night, we set down and put pencil marks on them. So when they came down, picked the badges up, got back in his truck, drove to the lab and punched out on time -- which would allowed him something like seven and a half to eight minutes on the clock time. When Post North started the tour and got to the lab and checked, the film badges was in the waste basket.

We weren't stupid. We knew things were bad and we knew there was problems going on there. We were not told -- we had to learn this on our own.

Now they keep talking about the film badge situation. They only worked when they were recorded properly. You've got to remember the AEC was very, very good at rainbows and flowers, we called it -- fill it out and make it look good and make the paper look good; don't make waves. Everything goes. We get our

money for next year's operating expense. The big boys get their bonus check for all the units that went out the door. Keep your mouth shut, don't say nothing.

Don't be going by this film badge stuff because it is not true and it is not accurate and we can verify this. They're starting this film badge thing, boys, don't count on it. These people lied.

DR. ZIEMER: Okay, thank you. Okay, we have some additional SC&A comments.

DR. MAKHIJANI: Thank you, Dr. Ziemer. I'm Arjun Makhijani. I won't continue for long, I just wanted to make a couple of quick points. They are in Section 6 of our review, Item 23 is very important because it covers a problem that affects the entire film badge record from 1955 through 1974, which is that workers have testified that they did not wear the badges all of the time. NIOSH has taken this into account partly only by dropping the zero doses. However, it -- the zero film badge recorded doses. It does not address the non-zero readings on the film badges as to how much of the time those particular badges were not being

worn, and even though they recorded non-zero doses, so here's a badge being worn; you go in, it records the dose, but part of the time it's left outside. So there's a missed dose in the non-zero film badges that has to be filled in statistically. The only way you can fill it in statistically is to have a sufficient number of workers who can testify that they wore their badges all the time and you know their job categories, so then you can estimate from interviewing other workers roughly how much of the time that these other badges were left off. Otherwise, you don't know what proportion of the exposure the film badge recorded actually represents. And so far as we can see, NIOSH has not addressed this particular missed dose question.

The second issue is the one of job categories, which I alluded to briefly yesterday. But we have looked at Dr. Fuortes's compilation for the whole period, which is not broken down by year, and we think there are considerable number of greater job categories than was indicated in the pie chart yesterday, which is not in the Revision 1 of the site profile, so

that was sort of new information.
I talked with Kathy DeMers, who is reviewing that data, at some length yesterday about this, and we believe that until you can actually address breaking down these -- drop the zero doses and break these down into job categories, that you won't actually be able to know how representative these are and develop a claimant-favorable value.
One or two more points quickly is that in our discussion with NIOSH, NIOSH agreed that the worker testimony that the pits were in -- at the pelvic area and not directly in front of the badge, NIOSH calculated an adjustment factor of 2.5 for -- for -- that is the doses in the pelvic area would be 2.5 times. Now this means that you actually have to go and adjust the film badge dose for many of the organs because the film badge would not be recording the organ dose, it just would record the dose where it was worn.
And my final point which we raised in the task three report, Dr. Ziemer, which the Board just mentioned yesterday but has not been reviewed, in the chapter that Kathy and I wrote in that

we raised the question a number of times that when job categories are involved and you have survivor claimants and the employee has passed away, you really need the coworker information. Otherwise, without that, you can't actually know which job the worker did. And so it raises the question of whether you can actually reconstruct the doses for survivor claimants. So there are a number of uncertainties. I don't have time to go into it in detail that go into the -- how the dose record is actually to be used. Thank you.

DR. ZIEMER: I wonder if Tim or any of the NIOSH people have some additional comments, follow-up at all?

MR. TAULBEE: Thank you, Mr. Chairman. There are a few points that I would like to talk about today to try and make some clarifications. And again, I'd like to, you know, recognize our SC&A colleagues. They've been trying to do -- understand what we've been working on for six months and they've been trying to do this in a period of a month, which is -- you know, they've done a tremendous job in doing so. But there's some areas where

we've got some miscommunication and I'd just like to try and clarify this so that we can, you know, try and move forward.

In particular, I heard a lot yesterday about the work factor and, you know, that this was a -- this is an exposure of one meter for one hour a day. That's too simple of an interpretation of the actual work factor. There's a lot more going on with that in how the era dose rate was calculated, and so this is -- I urge people not to try and interpret it along that way. If you understood what it was that we had done through the whole calculation, you'd find that it matches with what Mr. Webb and Mr. Iverson were talking about yesterday and their exposure experience. It's fully compatible with that. It doesn't appear it on the surface, and I understand that, and this is an area where I think we need to discuss more with SC&A so that they can understand what it is that we were -- were doing with that particular work factor.

Another point that I'd like to bring up is the mention of incident reports. Yesterday Mr. Miller had indicated that we had -- there was

only 15 incident reports. NIOSH has reviewed over 200 incident reports at the Iowa Army Ammunition Plant. We've categorized 15 as being radiological-related. So there are a large number of incident reports that we have and we have reviewed along those lines. So to indicate that we just have 15 incident reports and therefore this is not a -- you know, clearly we have not looked at all of the records is not quite true or not quite factual. What I'd like to try and emphasize there is that many of the incident reports are regarding high explosives type of work, and that was one of the major production processes here at the Iowa Army Ammunition Plant. And in looking at this particular slide up here where you look at, you know, 95 percent not monitored, this is the total number of workers. This is basi-- these numbers, from the best that I can determine based upon organizational charts, include secretaries and white collar workers and explosives workers who you would not anticipate would be monitored due to their lack of radiation exposure.

Part of why I made the argument yesterday that

workers -- the people that were monitored were among the most highly exposed group is due to -- in large part due to our interviews with workers who described work activities, just like Mr. Webb and Mr. Iverson did yesterday. And when I went back to Cincinnati and I saw those workers' dosimetry reports, these were the people that were monitored. So this gave me assurance that we really are monitoring -- or monitoring data is representative of those people who were doing the work like Mr. Iverson and Mr. Webb described yesterday.

Finally I'd like to talk a little bit about this slide some more here. Yesterday Mr. Mauro -- or Dr. Mauro mentioned that we would be assigning the geometric mean. What we'd be assigning is the whole distribution, the geometric mean plus the geometric standard deviation, so we would be giving credit to the 95th percentile, as he was proposing.

The final comment I'd like to make on this particular slide is when I saw this yesterday I was quite shocked at how high those numbers were. There's a -- again, a miscommunication going on between SC&A and ourselves as to when

you apply the neutron to photon ratio. You apply it before you make the adjustment for the under-response -- or now that we know it's not really an under-response of the film badge, and so these numbers are actually elevated by about ten rem, at least the ones prior to -- or 1962 and earlier. The neutron to photon ratio is applied off of the raw data, and then you apply the correction factor for photons and then the correction factor for neutrons.

And finally I'd like to comment a little bit on the work history that we heard talking about yesterday and Dr. Fuortes talking about where that information came from. I'm not sure we're talking about the same information of how I developed my pie chart. I was looking at the radiation exposure records, and there was a form filled out for each person -- and this is under one specific time period. It had "department" up in the upper right-hand corner. It didn't have job title, as Dr. Fuortes was mentioning yesterday. So I think we're talking about two different types of reports or forms, and so I just wanted to try and clarify that particular issue.

And the final thing that I would like to comment on is on the radon exposures, and this is something that NIOSH will go back and look at more. We talked more with Bill -- Dr. Fields (sic) last night, and this is something that we will try and track down a little bit closer. Thank you, sir.

DR. ZIEMER: Thank you, Tim. Hans, you have another comment?

DR. BEHLING: Yes, I have a question about the most recent comment here where you say the neutron to photon ratio corrections that were imparted based on revised photon doses is not the methodology. Now it's my understanding that the neutron to photon ratio of .79 was in fact done by Pantex data which used the corrected photon. I assume the 802 Panasonic badge gives you a correct photon dose, and on that basis you end up with a 0.79 neutron to photon ratio. And since we know for a fact that the earlier two-element film badge was incorrect, I will stand upon my position that the correct approach is to use a corrected photon measurement and then use the 0.79 and the 1.91. Unless I'm very mistaken about the

Pantex data, that would be my interpretation.

MR. TAULBEE: With the Pantex data the low energy photons have been stripped out, and so therefore you wouldn't be trying to apply that correction factor back in.

DR. ZIEMER: John Mauro?

DR. MAURO: Just one more point, and I think it's a very important point and has to do with this recurring theme of the geometric standard deviation and the geometric mean. Basically this has been going -- this has been an ongoing disagreement that has realized itself here whereby the general approach that's being adopted across the board by NIOSH when they have data to characterize an individual's exposure for filling the missing data is they will use the geometric mean and the geometric standard deviation within a -- let's say a lognormal distribution. Now -- and Tim is correct, that the approach they would use is they would use a distribution as representing a person. Our concern is when you do that, that means there's some -- there's a very real possibility that when you sample from that distribution and you try to reconstruct that

person's dose, it could be somewhat less or -- than the geometric standard -- than -- than the geometric mean or somewhat higher. Our recommendation or our position -- I think that's a better way to say it -- is that that doesn't necessarily give the -- it does not -- it's really claimant-neutral. Claimant -- I'll be -- giving the benefit of the doubt to the claimant would be to pick a fixed, high-end value, not a distribution, saying listen, we recognize there's uncertainty on this particular dataset and how applicable it is to a given person that we don't have data for. Our approach has consistently been -- this goes right back to Bethlehem Steel -- pick the upper 95 percentile value as your fixed value representing that individual. Now what you're doing under those circumstances is you certainly are giving the benefit of the doubt. What you're basically saying we're 95 percent certain that the dose that we picked to represent that person is in fact -- there's a five percent chance it could be higher, but we're 95 percent certain that it's that high or less. So there's a big difference in -- when

you're filling in missed data to use a distribution with a geometric standard deviation -- mean and standard deviation as opposed to simply picking a deterministic value at the upper end. This is -- I think it's a fundamental issue and I think it's an issue that (unintelligible) an ongoing discussion. It is my understanding that at this very time NIOSH is looking at that concept of operation that would affect many sites, including Iowa.

DR. ZIEMER: Thank you, John. I think Jim Neton is going to have a response here.

DR. NETON: In principle we agree with -- I agree with John Mauro and NIOSH agrees with that concept, that where workers who -- you have a distribution and have no knowledge of the facility or their monitoring status, you would apply the 95th percentile. I think what we've asserted in the profile -- and this is certainly open for discussion -- is that the workers who we have badge data for, we believe were the most heavily-exposed workers, the highest-exposed workers based on what Tim stated yesterday, the fact that he interviewed workers, they matched up with -- by job

category. They appeared to be in the departments that had higher exposures, and also there was a AEC requirement, a "shall" requirement in an AEC document in 1963 and '68 that workers who received more than ten percent of the annual exposure limit were required to be monitored. Now we can argue whether that -- they followed that, but that was the requirement at that time.

Based on those three pieces of information, we believe that these did represent the highest-exposed workers. So if that's the case, then assigning the geometric mean and the 95th percentile distributions about those values we believe would indeed be representative of the workers who were not monitored because they were, by definition -- if you accept that premise -- less exposed.

We're certainly open to discussion on this if -- if there is a belief and a consensus that these workers were not the highest exposed, we are definitely in agreement that the 95th percentile of that distribution then would be appropriate. Thank you.

DR. ZIEMER: Yeah, Jim Melius.

DR. MELIUS: (Off microphone) This is a question for Tim (unintelligible) -- (on microphone) follow-up to -- it's actually the same question I asked yesterday but I just want to clarify that -- the pie chart you showed, you've really only -- as I understand it, you've only examined the departmental distribution for monitoring for one year and you are unable to tell us what the denominator is within those departments that are included. The percentages in the pie chart are just the proportion of all monitored workers. Is that still true?

MR. TAULBEE: That is correct, sir.

DR. MELIUS: Okay. Thank you.

DR. ZIEMER: Yeah, Mark Griffon.

MR. GRIFFON: Yeah, I think -- actually I think Jim just hit on that one point, did -- and it was only for the one year that you have that department information?

MR. TAULBEE: Yes, sir.

MR. GRIFFON: Okay. And -- and to follow -- one other...

MR. TAULBEE: I only did that for one year. We could do it for more years. That's what I

wanted to clarify.

MR. GRIFFON: So you have the -- the forms, the data for --

MR. TAULBEE: Yes, sir.

MR. GRIFFON: -- more years.

MR. TAULBEE: Yes, sir.

MR. GRIFFON: And on the incidents, the 200 incident reports you have, do you have a time frame over which those -- were -- where they over the entire time frame we're looking at up here or was it a -- do you have any sense of when (unintelligible) --

MR. TAULBEE: I believe they're 1959 through 1974.

MR. GRIFFON: '59 through '74, okay. Thanks.

DR. ZIEMER: Okay. Thank you. Sir, did you have something pertinent to this --

UNIDENTIFIED: Yeah --

DR. ZIEMER: -- issue?

UNIDENTIFIED: -- this is addressed to Tim, I guess.

DR. ZIEMER: Yeah, state your name for the recorder, please.

MR. IVERSON: I'm Si Iverson. I talked yesterday. My name was just -- just mentioned

on film badges and -- and handling of the pits. Well, it was my experience we generally wore film badges for I think a month at a time. It may have been two weeks, but I think it was a month. And some people -- I mean were reassigned and -- and I -- sometimes I had badges when I was working around pits, and maybe for four weeks I didn't have one, and we had people move around. And we had so many different classifications and I'm not computer literate that well, but I can bring stuff up on a computer. I don't know how to go there -- I mean -- and job titles mean nothing because we've had several people transfer from one place to another just because it was more money. And they may have worked -- they may have been yard workers, they may have been -- been anything, laborers, and was able to come on the line. Why, you take a look at what job did they have when they wore the film badges. What was I doing when I wore a film badge? I mean I can't remember that -- that far back. I have to go through medical records trying to figure out what areas I worked in and what I did. There is no personnel records of what we

did or how we did it. Where are we going from here? Thank you.

DR. WADE: Thank you. I have to remind the group that this is not a public comment period. I think that --

DR. ZIEMER: Right, we appreciate the input on these issues, but we need to confine this --

UNIDENTIFIED: (Off microphone) (Unintelligible) --

DR. WADE: Right, since your name was mentioned, I think it's most appropriate.

DR. ZIEMER: Right.

DR. WADE: We also do want to hear things if they're relevant to these deliberations, but it is not a public comment period.

DR. ZIEMER: I'd like to raise some questions for either Tim or even our own Board members who had Q clearance. I'm trying to understand the generic pit, and I wonder if you can tell us what publicly is known about the -- what can we know about the generic pit, without having to be taken out and shot after the meeting is over?

MR. TAULBEE: With regards to the generic pit, Mr. Chairman, the whole design of the generic

pit was in order to try and estimate an upper bound of the particular dose -- of a dose rate from an object that workers would have been handling. In this we worked with the Department of Energy. We looked at -- we reviewed a lot of classified information and they understood and I explained to them how -- or what it is that we needed to be able to do. We needed to be able to set an upper bound so that from that point we could then begin to do dose reconstructions. Because if you can't set an upper bound, then you don't have a starting point.

And so from the design and the basis of that, we looked at the uranium pits versus composite pits versus plutonium pits. And clearly plutonium pits would result in the highest dose rate, and that was why -- that was one of the starting points that we did with that.

The other parameters -- all I can say, unfortunately, is the combination of those parameters in Appendix D of -- of no cladding, of mass, of thickness, of dimensions -- is all to maximize the dose rate, to come up with an upper bound. Okay? It's the combination of

those four parameters that result in an upper bound.

DR. ZIEMER: Mark?

MR. GRIFFON: I -- I think -- and I was in the -- the classified briefing, as well. I think -- you know, I don't think any of us in that room disputed the great and time-consuming work that went into development of this generic pit. The question -- and I think Tim said it right -- is this most likely has upper-bounding dose rate estimates. The issue I think before us is there's a lot of assumptions going from dose rate to worker dose, and that's where this work factor comes in and the use of film badge data, an enumerator divided by area dose, you're putting many assumptions into going from this dose rate -- this theoretical, generic pit model, which gives you a dose rate, is in fact -- most likely -- it -- it seems very upper bound, very conservative. The question then lies in the extrapolation from that to the workers' dose. How did the worker interface with -- you've got so many parameters in there, there's a lot of assumptions and I think some of us have questions in that part of it, so we

-- you know.

DR. ZIEMER: I --

MR. GRIFFON: But I think the generic pit question, the classified part of it, I think we were all pretty -- and I would ask SCA also to comment on that, but I think we're all pretty -- came away from that feeling that it was fairly conservative model, fairly upper-bounding model.

DR. ZIEMER: But is it true that a sharp physicist could take your dose rates and come up with a number of combinations of the four parameter-- is it four -- are you allowed to say how many parameters go into this?

MR. TAULBEE: There are four -- four parameters listed in Appendix D.

DR. ZIEMER: Okay, those four parameters and could come up with a number of pit configurations or combinations that would produce that dose rate, but all of which would not be a real pit. This is a worst-case pit.

MR. TAULBEE: That is correct, sir.

DR. ZIEMER: In other words, you're saying that it gives dose rates higher than any pit ever used anywhere, sort of like --

MR. TAULBEE: They are higher than any dose rate of pits worked on at Iowa.

DR. ZIEMER: Okay. Now, are you allowed to say how much higher?

MR. TAULBEE: No, sir.

DR. ZIEMER: Okay. So we don't know if it's barely higher, ten times higher or a hundred times higher, that sort of thing.

MR. TAULBEE: I'm not allowed to disclose what that factor is.

DR. ZIEMER: Even to disclose --

MR. TAULBEE: Yes, sir.

MR. PRESLEY: (Off microphone) (Unintelligible) Bob Presley (unintelligible) --

(On microphone) This is Bob Presley. I can say that what they have is more than adequate for -- for their dose reconstruction.

DR. ZIEMER: And Joe --

MR. FITZGERALD: And Mr. --

DR. ZIEMER: -- you were involved in that --

MR. FITZGERALD: -- from the SC&A standpoint, too. I think our process was to challenge and to raise issues that would, you know, I guess challenge the question of upper bound, and I think we were satisfied after a series of very

probing questions that in fact that satisfied that -- that issue, so I don't think it's an issue with the conservatism on this thing.

DR. ZIEMER: Now I gathered, though, that then coup-- you have to couple that with these work factors.

MR. TAULBEE: The work factor is how we go about trying to arrive at a more reasonable or more accurate estimate.

DR. ZIEMER: Right. Now, I understood from comments made yesterday that there are issues related to the work factor that are also classified.

MR. TAULBEE: That's correct. The era dose rate and how we developed that particular value, which is one of the fundamental parts of the work factor, I -- I can't go into how we actually did that calculation.

DR. ZIEMER: Well, let me ask this a different way. Are we obliged to use that work factor with the generic pit?

MR. TAULBEE: No, sir --

DR. ZIEMER: Is one obliged to use that?

MR. TAULBEE: That is our proposed method of how we would like to do dose reconstruction,

but I don't believe that we're obligated. I mean there could be modifications to that work factor or the methodology.

DR. ZIEMER: The large numbers we see here, though, and -- or saw in the chart are based on that work factor.

MR. TAULBEE: That is correct, sir.

DR. ZIEMER: Okay, I'm going to pass on this for a mom-- did you have something pertinent to this particular issue, sir? This is not a public comment period.

MR. JACKSON: Well, I am a production worker from -- Carl Jackson is my name. I was production worker from -- on Line 1 from '69 through '73 and I done assembly and so forth of these units and -- and in -- with the pits and so forth, and this one hour thing that they say that we're supposed to -- we was as close to those units as I'm standing right here to this microphone while we was working, and like I say, in the pelvic area. And we would be usually within maybe -- probably up to six hours a day being that close, or within maybe six foot or so.

As far as the gentlemen -- the people wearing

the film badges, in the areas that I was working, why, I wore them some, but the inspectors -- our company inspectors nor AE&C (sic) inspectors was the ones that seemed to wear them the most. Now their time spent against the -- within the one yard one meter would be considerable less than a production worker because production worker would be there assembling and working on these and then they would come in for a few minutes and inspect them, and then they would be back away from them. So your film badges -- I think the majority of them were worn by the inspectors, who did not spend as much time against -- in that exposure area. I just wanted to comment on that.

DR. ZIEMER: Well, thank you and in fact I think we understand, and this is why I'm raising some questions, because the work -- what's being called the work factor is perhaps almost a misnomer since it apparently includes another -- a number of other items that go into -- it's not a work factor in the usual sense, such as we use -- for example, in X-ray shielding design where it represents the actual

amount of time. As this gentleman said, they're working more than one hour a week with these so that -- that's some kind of a modified work factor that has been generated with some other secret items, so -- yes, Doctor.

DR. FUORTES: Yes, thank you. I just wanted to address the issue regarding the incident reports, the 15 radiologic incident reports. You're right, there are a couple of hundred. We actually provided you with those incident reports. Those came from Pantex at our request. We and Bill Field, our radiation health expert, were rather surprised that there were so few radiation incidents. And in fact, we had -- even from what we had heard from workers, we were surprised that the data in the boxes that we received did not reflect our perceptions of what a health and safety process in such a facility would -- would reflect. The vast majority of these incident reports were motor vehicle accidents, fires. They dropped bombs every now and again. And one thing that has to be made perfectly clear, this is not a complete record -- not even on the basis of my suspicion, but on the basis of the years

covered. There are missing years. So of these 200 incident reports, that might be over a period of 15 years or ten years. It's not the duration of the -- of the operations. So there are intermittent years that are -- that are missed in those incident reports. Why data is missing, it's probably just because they're misfiled in boxes that we couldn't recall, but it's not a complete record.

DR. ZIEMER: Thank you. Is Bill Fields (sic) here this morning?

UNIDENTIFIED: (Off microphone) I'll go get him.

DR. ZIEMER: The Board members did receive I believe a letter from Bill Fields within the past week. Board members, did you all?

UNIDENTIFIED: (Off microphone) Yeah.

DR. WADE: We've got a copy here.

DR. ZIEMER: Dr. Fields is -- I think would be considered a radon expert by most, and I think it would be helpful to have a little bit of input from Dr. Fields, if we could, on the radon issue.

Okay, well, perhaps later in the morning if -- if Dr. Fields does come to the assembly, we can

get some comments on that.
Board members, do you have other questions for either Tim Taulbee or for the SC&A team? Otherwise we're going to proceed with -- I see Dr. Fields (sic) -- I can spot him pretty easily, as you can -- Dr. Fields, I'm going to put you on the spot, but would you mind approaching the mike and -- first of all, if I could ask you to tell the Board a little bit about what work you have done in the radon field over the past number of years.
DR. FIELD: I was involved with the first surveys that were -- the first surveys that were ever done in Iowa, just to characterize the radon distribution within the state. Since then I've been involved with case control epidemiology studies. I've served on the international pooling that pooled all the residential studies together, the north American pooling group. I'm on the World Health Organization, two working groups for the World Health Organization, chairing the committee on radon measurement mitigation, so quite a bit over the years.
DR. ZIEMER: Could you reiterate for us your

characterization or perhaps your opinion on the issue of radon in the Gravel Gerties and the related areas and what potential for radon exposure might occur there? And let me ask you that in this context. I assume you're familiar with the Watras house in Pennsylvania.

DR. FIELD: (Unintelligible)

DR. ZIEMER: What -- what were the radon levels there?

DR. FIELD: Oh, the radon concentrations there were in the thousands of picocuries per liter, I mean extremely high.

DR. ZIEMER: The radon levels in the next door neighbor's house were --

DR. FIELD: It was -- it was fairly low. Some -- some in the neighborhood were below the EP action level, so it's -- it's very hard to characterize a home based on -- based on what's nearby. In other words, like you're -- like you're alluding to it, you can't say just 'cause one house is high the house next door is going to be high, also. That's a common mistake a lot of people make.

DR. ZIEMER: What can you tell us then about the Gravel Gerties?

DR. FIELD: Well, I -- I think it -- more so, what can I tell you about Iowa. Iowa has the highest radon concentrations in the nation, mostly from glacial deposits. And it's not that the radium is that high in the glacial deposits, it's just that the surface area is so great, so there's a large emanation fraction from the soils in Iowa. No other state compares to it. So there's a lot of variation within Iowa as far as radon concentrations.

We did a survey about five or six years ago that was published in (unintelligible) *Health Perspectives*. In that survey we found that the range of outdoor radon concentrations -- this is a year-long concentration -- ranged from .4 to 1.5. So the outdoor concentrations can be very -- very high in Iowa because of the source material.

The -- what you find in Iowa generally is that you find 70 percent of homes and basements are above four picocuries per liter, and ten to 15 percent are above 20. So those are normal residential settings. If you go to underground structures, like if you would go outside here and go in a utility -- utility service area,

they can be 200 or 300 picocuries per liter. It's very common, and it's a concern we have for workers that worked at these -- work in these areas.

As far as the Gravel Gerties, they were underground -- pretty much all underground, plus they had the -- above the ceiling there was also gravel in case there was a criticality, that would -- that would drop, and we know all the reasons for that. But we don't know the emanation -- factors just for that material alone could be fairly significant. But to go back and reconstruct that would be difficult. All we can say is that it's higher than 1.5 picocuries per liter, which was the value that was suggested to be used. I mean that would be a claimant-favorable value if you were making that value represent outdoor exposure, and that -- that would be fairly claimant-favorable for even outdoor exposure, so I guess in summary the underground areas would be -- you know, they could -- they could be extremely high.

What you -- what could be done potentially is go back and look at glass surfaces for imbedded

progeny and try to reconstruct it that way, but there's very few glass surfaces in those areas and you don't know the age of the glass, so you're not sure how representative that is. So that's -- that's a method that could be used and I suggested that -- to do that for the past five or six years and it hasn't been followed up on.

Without that, it would be difficult to go back today without the gravel and -- and to reconstruct that. The source is obviously going to be there, except for the gravel. But you don't know if the ventilation patterns are similar or not.

DR. ZIEMER: And the extent to which Pantex Gravel Gerties would apply here?

DR. FIELD: Well, you -- the main -- the main factor with radon source material -- obviously the source material's not -- not in Texas -- the same in Texas as what we have here, so you know, it's really apples -- apples and oranges. Texas is rated as a very low potential for radon. Iowa's very high. So using that as a surrogate is not very logical.

DR. ZIEMER: Thank you very much.

DR. FIELD: You bet.

DR. ZIEMER: Board members, any questions for Dr. Fields (sic)?

DR. FIELD: If I -- if I could while I'm here, I'd just like to make a comment about the cards and -- and the job descriptions and the departments. I'm not really sure it's clear where that information came from. As -- as you know, there's a lot of cards -- index cards that represent worker terminations. Or if they would change jobs, that would be reported there. There's also a summary, yearly radiation record for each employee that was terminated that does have the department up top. But I just want to caution you that the department that is being represented for that individual is probably not the department or may not be the department they were in when they received the exposure, so just a bit of caution to that.

DR. ZIEMER: Okay. Thank you very much. I think perhaps then we're ready to actually start today's agenda.

IAAP SEC PETITION

We'll begin with the presentation by Larry

Elliott from NIOSH on the review of the Special Exposure Cohort petition by Iowa Army Ammunition Plant. Larry Elliott from NIOSH.

PRESENTATION BY NIOSH

MR. ELLIOTT: Thank you, Dr. Ziemer, and good morning, ladies and gentlemen of the Board. And good morning, audience; welcome to this morning's discussion.

I'm going to shift your focus a little bit this morning from the discussion around the site profile or Technical Basis Document and we're going to now focus upon the Special Exposure Cohort petition evaluation, our report -- our evaluation report of that petition, as well as the supplement.

My presentation this morning will cover several different areas relevant to that focus. I will talk a little bit about the petition itself, give you an overview and a time line on how we received and processed and worked up the evaluation for the petition.

I will also speak to the evaluation process itself. I will present a reminder, if you will, to the Board of its role and its responsibilities under the statute and within

the regulation about contributing to the evaluation of a Special Exposure Cohort petition. And I will go over the supplement report that we provided since the last meeting of the Board in St. Louis, and I'll conclude with the summary findings.

The Iowa Army Ammunition Plant petition was submitted on June 15th, last summer, in a town hall meeting in Burlington, and the initial class definition is listed on this slide -- and I won't read it for -- for the audience; I'll let them read it themselves. But essentially it covered all of Line -- Line 1 and the various areas around the plant where AEC work was being done.

We worked with the petitioners on the petition -- the basis for the petition to present a solid basis for evaluation, and that took us until October 20th, when the petition was qualified for evaluation. We work with petitioners to make sure that -- that all of the basis and background that is relevant to the petition is covered in the petition so that we don't miss anything and the petitioners understand what is required under our rule for

that basis.

The petitioners were then notified by letter, and a notice that the submission had qualified for evaluation was published on our web site in October of 2004. Next slide, please.

NIOSH evaluated the petition using the guidelines that are set forth in our regulation, 42 CFR 83.13, so I draw your attention to that particular section of our rule -- our regulation. And the -- specifically, this section speaks to is it feasible to estimate the level of radiation doses of individual members of the class with sufficient accuracy. And if not, then we have to establish the second part of the test that's prescribed by the statute and by the rule, and that is, is it a reasonable likelihood that such radiation dose may have endangered the health of members of the class.

NIOSH presented the petition evaluation report to the Board in St. Louis at your February 9th meeting. Again, the evaluation report proposed this following class definition, which was very similar if not the same as the initial definition that was provided in the petition.

During NIOSH's presentation at that meeting it was stated that the revised -- I stated that the revised Iowa Army Ammunition Plant site profile that we had worked up was at the Department of Energy being reviewed to determine whether or not the manner in which we had characterized classified information created a classified document or not. That particular document was provided to the Department of Energy back in December -- or excuse me, January of this year for that review. And in addition, at the February meeting there were several issues that were raised by the petitioners that were not addressed in NIOSH's evaluation.

Can I just say here that -- that I believe that the Congressional delegation that we heard yesterday were -- were right on target, that they understood what was going on when they passed this law. They understood in fact that there were classified information that would have to be accessed. The statute actually speaks to that in the U.S. Code, Section 7384(q), and specifically says that DOE has to give access to NIOSH and to this Advisory Board

to classified information in order to evaluate the addition of classes and to do dose reconstructions. So I agree, I think they actually understood what was going on with this particular work force and the nature of the work that they were doing. Next slide.

On February 14th the Department of Energy completed its review of the revised site profile and sent NIOSH a hard copy of that reviewed site profile. When Tim Taulbee worked this up in a classified setting at DOE, he had to do so on a classified computer, and they would not release an electronic version to us. We -- we received a hard copy version.

Then through the middle part of February to the end of February, as you see here, we had to create an electronic version again. This was somebody sitting at a computer in our offices retyping all of that information that Tim Taulbee had worked up in the classified secure setting.

And then we had to incorporate and -- we had to reconstitute and incorporate all of the tables and all of the graphs and that kind of illustrative information that was not in the

text itself and add that to the site profile. This took a lot of time in order to make sure that those were accurately and adequately incorporated. Next slide, please.

On March -- through the early part of March and even before, while the typist was working up the electronic version, we were reviewing the content. I find it somewhat distressing that, you know, our Q-cleared folks have to work through this in a secure setting. They're limited in number. We're -- we're not allowed to have everyone Q cleared in my shop, and so I have to rely on the good judgment and the professionalism of Tim Taulbee and Mark Rolfes and others who are Q cleared. Then we take whatever they -- their work comes out of that secured setting and we have to review it from a technical basis as well as a policy basis. So there were several people involved, after this secur-- this document had been deemed unclassified, in reviewing the technical basis and the policy basis that it presented.

We did make some changes -- I need to reflect here that DOE did not redact any information, nor did it change the document in any way. It

simply -- they simply reviewed the document and found it to be unclassified. The changes that were made were made at NIOSH in my office, and they were made to improve the readability and to correct some technical errors that entered into the -- the development of the electronic version of the document.

On March 14th I approved the final version of this document and I sent a copy of that document to the Advisory Board through Dr. Ziemer, and we also published it on our web site and we noticed -- announced its availability and provided it to the petitioners, as well. Next slide, please.

On March 16th then Dr. Ziemer sent a -- a letter to the Board that indicated that DOE had informed NIOSH that this document was unclassified and it was publicly available.

Our determination then was, from the document, that for cases where employment was post-1963 we could do dose reconstructions and they could be done with full disclosure of information.

The converse of that is bef-- prior to '62 we would be using information that we could not disclose, as you've heard from Tim Taulbee in

discussion of the site profile.
On April 4th, 2005 the SEC petition evaluation report supplement -- this is in response to things that we heard and issues that were raised in the February meeting in St. Louis -- was -- was approved and submitted to the Board and to the petitioners and available to the public on our web site.
On April 11th then the Board met via teleconference, and the Board voted at that time to wait and review the information on the Iowa Army Ammunition Plant at its Board meeting here today -- this week. Next slide, please.
I'm going to go into the evaluation process now with you, and this is governed by the -- the evaluation of SEC petitions are governed by the statute, as well as the regulation that this Board helped us promulgate over a year ago -- under a year ago now, last May. And the two tests that must be met there are listed here.
Again, is it feasible to estimate the level of radiation doses of individual members of the class with sufficient accuracy -- and let me reflect just a moment at this point on what 83.13(c)(1) in our rule actually prescribes.

This is where we define sufficient accuracy for the Board, and I think it's important that as we shift your focus from the site profile to this SEC evaluation report to do so at this point, to provide you that definition.
The definition of sufficient accuracy for handling petitions in determining whether we have sufficient information to do dose reconstruction is listed here under 83.13(c)(1), (reading) Radiation doses can be estimated with sufficient accuracy if NIOSH has established that it has access to sufficient information to estimate the maximum radiation dose for every type of cancer for which radiation doses are reconstructed that could have been incurred by plausible circumstances by any member of the class, or if NIOSH has established that it has access to information to estimate radiation doses with more -- 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 here the employees worked to serve as a basis for a dose reconstruction.

If we find that we cannot do dose reconstruction under those premises and those requirements, then we have to establish the second prong of this test, as required by statute. And that is, is there a reasonable likelihood that such radiation dose may have endangered the health of the class. Next slide, please.

To continue on with the evaluation process, these are elements that are prescribed within our regulation, and we -- this presents the various information and types of material that were reviewed to make this evaluation. Certainly want to say that we agree that we need to look at the rest of the boxes, but at some point in line of that research effort and an evaluation of data, we have to make a conscious decision on timeliness and when we can move forward and present not only an evaluation report, but start doing dose reconstructions, as well. And so to determine the completeness of data -- data search falls into that -- that conundrum of making a decision about timeliness versus how much more do you search for.

Now this doesn't mean that we have stopped searching or we will stop evaluating records. We will continue to pursue that, and I think it's even more important that we pursue that as we -- we've heard from our colleagues from Sanford Cohen Associates, as we've heard from workers, as we've heard from issues and concerns raised by Dr. Fuortes and by Dr. Fields (sic) at this meeting and at the February meeting. I agree that we need to look a lot harder at radon than we have in the current site profile. Next slide, please. Let me talk a minute about the Board's responsibility -- but before I do that, I want to offer this. I have been quoted as saying that I believe that this work force has been put in harm's way unbeknowingly (sic), and I want to just make that -- here for the record, I do believe that personally. I think that many of -- many folks across the weapons complex, across the AEC complex were put in a work environment without proper knowledge and understanding of the hazards that they faced. I think it's important, though, to realize that in the early times of this work force there was

limited knowledge about the type of exposure, the type of hazards that they faced, and we need to take that into account.

I'd also like to thank at -- at this point, before we talk about the Board's role, I'd like to thank our colleagues at Sanford Cohen & Associates. Tim was very correct when he said earlier that they had a difficult challenge in trying to do in a month and a half essentially what it had taken us over six months to put together. And so we were working very hard on that, and lo and behold, they get a short amount of time to do their work. We appreciate their contribution that they've made and the scientific questions that they've raised, and we take those very seriously. I think we all want the same thing. We're all working toward the same thing. At least that is my hope and that is my desire and I'm moving toward that.

Now let me move into the role and the responsibility of the Board. Your role and the source of authority for your role comes from the statute and also from our -- the regulation that you helped us promulgate last year, 42 CFR Part 83. Your main role here is to consider

and advise the Secretary of Health and Human Services on a petition to add a class to the Special Exposure Cohort. Next slide, please. To do so you need to consider the petition and the NIOSH evaluation reports, both the initial report and the supplement report. That is to be done at a meeting. You have -- this is the second meeting you will have done this particular deliberation on Iowa with petitioners and public present. You have some options. You can ask us to obtain additional information, or you can ask us to continue our evaluation of a petition. And I think from our February meeting that's what we heard, and we come back to address those issues in our supplement.

You then have to develop and transmit to the Secretary of HHS a report containing your recommendation, and there's some specific requirements for the content of that report, and they are listed in here in this slide. You need to speak to the petition itself, the definition of the class that you're recommend-- your recommendations pertain to, whether or not you recommend to the Secretary to add the class

or not add the class, and you need to consider the relevant criteria for your recommendation under 83.13(c), as I read to you earlier. Next slide.

Finally, we must all consider the privacy of these individuals and -- and not breach the Privacy Act or their privacy by any unwarranted or inadvertent action. So I'd just caution you on that, as I always do. Next slide.

Now we'll move into the evaluation report, and I'll present just a summary. Some of this will be some of the same information that you've had in the February meeting.

The evaluation report that we presented to you in St. Louis spoke to three different classes based upon these three time frames: June of 1947 to May of 1948, May 1948 to March 1949, March 1949 through the end of 1974. Next slide.

We had to look, for this evaluation report, at a variety of information and data, and we had to make some decisions as to how far we dug and when we had enough to make a determination -- a summary of findings. Next slide.

Our petition evaluation report summary for June

of '47 to May of '48, based upon the data that was available to us, indicated that there was no radiation exposure for this time period. No radioactive materials or radiological processes existed at Line 1 in Iowa, and I think one of the petitioners confirmed that for us, as well -- Mr. Anderson at the last meeting. Next slide, please.

For the period of May 1948 through March of 1949, in our evaluation effort we determined that there was a separate class here that had been -- that consisted of radiographers, those individuals who were using X-ray technology to evaluate the high explosive components and other components that were used to assemble the bomb, and we are still working up a -- an evaluation of that particular class, and we will present a evaluation report summary at one of your future meetings. Next slide, please.

As regard to the third class, data availability for March 1949 to end of 1974, prior to 1955 documents suggest that there were no nuclear capability at the Iowa facility. However, those documents were not definitive for us, and we were aware that records may have been

destroyed, mislabeled, mishandled, misfiled, et cetera. And since we have not been able to find direct evidence as to when nuclear capability, nuclear -- radiological materials were first introduced to the site, we have made an assumption that there might have been nuclear capsules as early as March of 1949. That would be the start of this class definition period. Next slide, please.

The feasibility of dose reconstruction for the period -- the class for the period of June 1947 to May 1948, NIOSH has determined that no feasibility determination is necessary since members of that class received no radiation doses, as covered by this compensation program.

The feasibility of dose reconstructions for May of 1948 to March of 1949 -- again, this is for the radiographers -- is under way. It's an evaluation effort under way and we have not prepared a report for your review at this time.

As regard to the feasibility for dose reconstructions for the third class, the class of interest today, March 1949 to the end of 1974, NIOSH believes we have access to sufficient information -- source term, process

information, photon and neutron dose calculations -- to estimate either the maximum radiation dose incurred by any member of the class being evaluated, or to estimate such radiation doses more precisely than a maximum dose. The sum of information available from the site profile and additional resources is sufficient, in our opinion, to document or estimate the maximum internal and external potential exposures to members of this class. Some technical bases -- source term, process information, both photon and neutron dose calculations -- for sufficiently accurate dose reconstructions for members of the class depend upon the use of classified information that is not available to the public for reasons of protecting national security. This limitation on transparency of NIOSH dose reconstructions for the Iowa Army Ammunition Plant we feel may undermine the credibility -- we recognize that it may undermine the credibility of such dose reconstructions for the claimants. And while it is scientifically and technically feasible to estimate the doses with sufficient accuracy, such estimates may not be able to be

substantiated in a transparent and publicly-available way.

NIOSH sought this Board's advice on how to handle this kind of a situation in February at your St. Louis meeting, and we continue to seek that advice today.

Let me speak for a little bit about health endangerment for -- for these classes. For the period of March 1949 to 1974, the -- while we say we can do dose reconstructions, I want to make sure that everyone realizes we recognize that the health probably was endangered by the workers (sic) in this -- in this facility, and these are the types of different exposures that we would recognize as contributing to that endangerment.

While we talk about incident reports, we see no discrete incidents that would have involved exceptionally high levels of acute exposure or criticality incident level exposures. And the workers in this case we feel have accumulated substantial doses through chronic exposure to external sources of -- of radiation.

Let me talk a minute about the supplement.

This is the report that we sent to you in March

that responds to issues that we heard in St. Louis, and we tried to, in that report, address those issues. I'll briefly go through the issues and then I'll provide you a brief summary of our response to those issues.

The issues that were raised in St. Louis in February are listed here on this slide and the next. The Revision 1 of the Iowa site profile was reviewed by DOE and found to contain no classified information and a question was -- has been raised how does this affect the transparency issues that were discussed in February.

Secondly, the SEC evaluation relies on data from Pantex workers exposed between 1993 and 2003. And recent data collected at Pantex is felt that it cannot be considered as representative coworker data for Iowa plant workers, and this information is from the -- because this information was from a different time period which employed different work processes.

Workers recalled situations where beryllium outer shells of the pits came off and would have to be glued back. This proves that

workers -- it was felt that this proves that workers handled bare plutonium pits, creating the potential for internal exposure.

Four, workers reported that they smeared the inside of hollow spheres consisting of what was known as "hot material," and this has implications for exposure to unshielded ionizing radiation.

Five, even after 1962, a low percentage of the work force was monitored for radiation exposure, and it is felt that this did not provide enough data to make accurate estimates.

Now our response in addressing these five issues that were raised. With regard to the transparency issue and the DOE deeming the site profile unclassified, on February 9th when NIOSH presented its evaluation report to this Board I advised the Board that the Iowa site profile had been revised and was working through DOE in a classification review. We felt that we had all the information necessary to complete the revised document at the time the evaluation report was presented to the Board. However, we could not speak about that because we weren't certain that the manner in

which we had characterized that information in our site profile -- we weren't sure whether it would be deemed classified or not. And at the February Board meeting Board members and the public raised issues about due process and questions about how dose reconstruction could be done without full disclosure.

My limited understanding of this particular slide (sic) is presented on this slide, and I'll go through the slide and at the end of my presentation if there are questions about this decision or this determination, I'm sure that Liz Homoki-Titus, a representative of our Office of General Counsel, will be at the ready to respond to questions as best she can.

But basically Friday of last -- last Friday we received information that legal advice from the Department of Justice had been proffered in an opinion, and it has been concluded that non-disclosure to the public of classified or restricted information does not qualify a class for addition to the Special Exposure Cohort if sufficiently accurate dose reconstruction is otherwise feasible using classified or restricted information.

The Secretary therefore has no authority legally to grant a Special Exposure Cohort petition based on classified or restricted information that may be used in evaluating that -- that petition or in doing dose reconstruction.

Department of Justice has also indicated that access by claimants or the public at large to classified or restricted information on which HHS may rely in making its feasibility determination is not required for due process considerations. Petitioners will have the opportunity for an administrative review within the Department, as provided within our rule. And if the petitioner files a suit and the court concludes that it is necessary, the court can review the classified information in -- ex parte or in camera.

DOE review, as I said earlier, did not redact any information from our revised site profile document. And while we at NIOSH feel that disclosure is an important program value, it is not an overriding limitation of scientific ability to conduct dose reconstruction.

NIOSH now believes that the revised site

profile document, as it currently exists, allows for dose reconstructions for those cases that would be completed after 1962, and to do so with full disclosure. There will continue to be some classified information, NIOSH believes, while it's still feasible to complete sufficiently accurate dose reconstructions for cases before 1962.

The Special Exposure Cohort evaluation relies on data from Pantex workers. This issue was raised at your last meeting. Our response in our supplement speaks to the fact that area monitoring devices at Iowa could not measure the low energy neutrons, which necessitated the use of Monte Carlo N-Particle transport code calculations that were used to construct the low energy portion of the spectrum. Because of this, our recommended approach to estimating potential neutron doses for Iowa workers is to utilize the ratios of neutron to photon doses obtained from Pantex dosimeters during the period of 1993 to 2003.

Based upon this Monte Carlo neutron proton transport code calculations and neutron -- nuclear track dosimeter type measurements at

Iowa, the measured Pantex neutron to photon ratio from '93 to 2003 is greater, by a factor of approximately three, than the actual Iowa data would -- would yield. Thereby we find it to be a more claimant-friendly approach than the use of the Iowa neutron measurement data alone.

The third issue that was raised in St. Louis was that workers recalled instances where beryllium outer shells of the pit came off and would have to be glued back on. This was felt that it -- it indicated that the workers were handling bare plutonium pits. As noted in our evaluation report on page 25 of that evaluation report, this cladding -- all the pits were cladded, and the -- this precluded the potential for internal exposure. This cladding is in addition -- it's -- it's -- it's in addition to any beryllium outer shell material that may have encapsulated the pit. And so if the beryllium cladding were removed, the radioactive pit material would still have been encapsulated in cladding.

The cladding may have been thin, and it may have been warm to the touch, giving the

impression that the radioactive material, while attaching or gluing the cladding materials on, resulted in handling of bare pits, but that's -- we don't believe the case. The activity of reattaching the out shells is more than accounted for in the revised site profile because the site profile assumes that there was no cladding whatsoever. This is a claimant-friendly assumption and we use that 100 percent of the time in our proposed dose reconstruction effort.

The fourth issue that was raised was that workers indicated they smeared the inside of the hollow sphere consisting of what was known as "hot material," and that had implications regarding exposure to unshielded ionizing radiation. Our research of this process reveals the operation involves the removal of the explosive component from the ball to allow the capsule to be placed inside. And during the assembly operations thus the fissile capsule was not present, so no radioactive -- it was not radioactive at all. It would have been composed of non-enriched uranium -- if radioactive at all, it would have been composed

of non-enriched uranium, excuse me.
If the ball were uranium, the beta dose on the skin of the hand and the forearm could have been significant, and NIOSH is continuing our research to estimate the skin dose for that region.
I'd like to point out that -- however, the external dose to organs, other than the skin on the hands or the forearms, would be very low. So you know, the skin of the hand and the forearm would have been close proximity to the pits, but other organs and other sites on the body, the dose would have been very low. Next slide.
Fifth issue raised, even after 1962 a very low percentage of the work force was monitored for radiation exposure. This does not provide enough data to make accurate estimates of the unshielded ionizing radiation.
At the Iowa Army Ammunition Plant, the primary production process -- as you heard from Tim and others -- was actually the manufacture of high explosive materials. And the AEC operation was the only operation that involved radioactive material, and several people were involved in

that aspect. We understand that. The testing of these high explosives in many instances did not involve radioactive materials; and where they did, they are documented. Consequently we feel that most workers at the plant would not have been -- was not necessary for most workers at the plant to have been monitored for radiation exposure.

We believe that dose reconstructions can be completed using the Iowa coworker data that represent a greater potential for exposure. Those workers that were monitored, we believe -- as you've heard in our site profile discussion -- represent the highest exposed individuals. I do believe that we will -- as we go through records and we look at additional information, you must recognize that it's possible that as we find that information it refines our ability and our estimates for dose reconstruction, so the -- the site profile that you have before you is an overestimate and it's claimant-friendly in that way. But as more information becomes available, that could drive the dose estimates down. Next slide, please.

The site was also involved with the final

assembly of nuclear weapons. This is well known, and the Iowa plant simply assembled those components into final configuration with the explosives. They also did disassembly and they did surveillance, as we've heard. We believe that the workers who routinely handled the most radioactive materials were routinely monitored after 1963.

Workers who conducted other non-assembly jobs were monitored until 1968 -- were not monitored until 1968, and as a result at Iowa the dose distribution developed from a moderate number of workers with the highest potential for exposure we feel is claimant-friendly, especially when applied to non-assembly line workers.

In summary, our proposed class definition for this petition is presented here as all employees working at the Iowa Army Ammunition Plant Line 1, which includes Yard C, Yard G, Yard L, the Firing Site area, Burning Field B and the storage sites for pits and weapons, including those Buildings 73 and 77, from March of 1949 to 1974.

And in this summary slide we characterize the

classes as we have identified them. From June of 1947 to May of 1948 there was no fissile material present so feasibility is not applicable, no health endangerment. From May of '48 to March of '48 we're in the process of making that evaluation, and that is yet to be determined.

From March of '49 to December of '62, yes, we feel it is feasible for us to reconstruct doses with sufficient accuracy using our maximum dose estimate based on the site profile and use of the generic pit and use of the work factor that we have presented to you in -- in that report and here at this meeting. Therefore, because we can do dose reconstruction, the issue of health endangerment test is not applicable.

From the time period of January 1963 to December of 1974, yes, it is feasible for us to do dose reconstructions, and that will be done with full disclosure of all information, as you've heard. And again, we don't have to address the second prong of the test. It's not applicable.

I'll try to entertain any questions. I may ask for --

DR. ZIEMER: Thank you, Larry. Larry, can you say officially for NIOSH, aside from the feasibility of doing dose reconstruction, does NIOSH agree that nonetheless there was health endangerment for the two periods involved?

MR. ELLIOTT: Yes. I alluded to that earlier in my slide. We believe that there was exposure there --

DR. ZIEMER: It's only non-applicable here --

MR. ELLIOTT: In the test.

DR. ZIEMER: It would not be required if you proceeded with dose reconstruction and this was not a Special Exposure Cohort.

MR. ELLIOTT: That is correct. To apply the two tests that must be met --

DR. ZIEMER: Right.

MR. ELLIOTT: -- we would speak to health endangerment if it was found that the first test, can we do dose reconstruction, was not met.

DR. ZIEMER: Right. Also if I could ask, before we have questions here could we have any additional statements from -- from general counsel on the issue of transparency that you referred to in your slide? Is Liz here? Liz,

can -- can you add any -- or do you wish to add anything to Larry's statements on that issue for the Board?

MS. HOMOKI-TITUS: I don't have anything to add. I --

DR. ZIEMER: Okay.

MS. HOMOKI-TITUS: -- know about as much as the slide --

DR. ZIEMER: Oh, okay.

MS. HOMOKI-TITUS: -- so...

DR. ZIEMER: Thank you. Okay, let's begin with Dr. Melius, and then we'll go to Mike Gibson.

DR. MELIUS: First I'd like to make one -- what I believe is a correction to what Larry said. I think, Larry, you stated that the Board had requested further evaluation and further information be developed on Iowa. I don't believe that is accurate. The Board, at the last February meeting, voted to approve a Special Exposure Cohort, and that was -- that motion is actually still active. I mean we -- we voted essentially to table it at our conference call until this meeting. We never did request this -- this information. I mean, again, I don't object to NIOSH developing it,

but I think it's inaccurate to say that the Board requested that you develop this further information. All of this is responsive to some of the concerns that others raised at our last meeting, but these -- the Board never really had an opportunity to ask for further information from --

DR. ZIEMER: I think that's correct. It was my understanding that these were requests from --

MR. ELLIOTT: Perhaps I confused you or I misspoke. I mentioned in one slide that you have -- that's an option available to you under your responsibilities. If I misspoke, I'm inaccurate. I agree, I --

DR. ZIEMER: The five items that you followed up on came out of the floor discussions, I believe. Was that so?

MR. ELLIOTT: I agree, the Board -- I may -- perhaps I did misspeak, but I was speaking -- I recall I was speaking to the Board's responsibility. That's certainly one of your options. If I misspoke, I will correct that now. The Board did not ask NIOSH to make the supplement evaluation report available. It was what we considered and we did, post the

February meeting, and we felt we needed to address those things. You're quite right.

DR. ZIEMER: And let me also emphasize and what Dr. Melius says is correct, the Board's action remains its action. The only thing that has occurred is that we have not actually sent forward a formal recommendation in -- and there is -- a letter was referred to that was -- the Chair had to make a decision, when the new document appeared, as to what we should do, because our charge also requires that our evaluation to the Secretary be based on the petition review of NIOSH. And NIOSH was now reviewing -- or -- or reviewing a new set of -- new piece of information, so we had -- in a sense, we're almost required to look at, even though we had taken action and that action still remains in effect, unless changed or somehow altered at this particular meeting. Michael? I'll come back.

DR. MELIUS: And then I have some more, yeah.

MR. GIBSON: I guess the first question I obviously have is one that probably everyone in the room has a question and is there anyone in the room, government agency or otherwise, that

knows who asked the Department of Justice or how the Department of Justice got involved in making this legal determination that the classified information does not constitute a reason for a Special Exposure Cohort?

MR. ELLIOTT: I do not know. I don't know if Liz can answer that question or not, but I do not know.

MS. HOMOKI-TITUS: I can't answer that question fully because I don't have that information. I can let you know the role that the Office of Legal Counsel at Department of Justice plays for all Executive Agencies, and that may help guide how this opinion came from them. And this is actually public information from their web site.

They function as the legal advisor to the President and all Executive Agencies, including being outside counsel to Executive Agencies, and they usually deal with legals that are considered particularly complex or of a novel legal question, which this is since this is a new issue. And they're also responsible for providing legal advice to departments on all Constitutional questions, which due process is

a Constitutional question. And I believe that the reason that this was followed up on is that it was brought to the Board at the last Board meeting, as many of you are aware, and you had a great deal of discussion about it. And although you didn't send a recommendation to the Secretary as a whole Board, we obviously try to follow up on issues that are -- you all consider important and we consider important. And since it was brought to you and Dr. Melius actually spoke to this a number of times on the record, saying that it was difficult for you -- us, I believe referring to the Board, to develop the regulations or system of whatever -- whatever you want to call it, dealing with this for the whole program -- again, he says, he's talking about the context for the last petition was a single petition, and he said I think it's really up to the agencies, and particularly since we advise NIOSH, NIOSH to come back with the procedures that if they decide that's the best route, that should be taken. And I'm not saying we're adverse to that, I just don't think we can formulate it here. And since the Board was obviously

struggling with that issue, the Department, you know, wanted to provide the advice that you all apparently had sought.

MR. GIBSON: And where in this current legislation does it specifically give the Department of Justice the right to make this determination that the Secretary does not have the authority to grant Special Exposure Cohort based on...

MS. HOMOKI-TITUS: Again, I can only refer you to the role of the Department of Justice, which is to legally advise Executive Agencies on novel legal issues, which this is a novel legal issue, and apparently their opinion was sought. That's not authority that would be given -- I believe in any statute. I don't know that, though. But obviously the Department of Justice is the legal advisor to the Federal government and the Executive Agencies in particular through the Department of Legal Counsel.

MR. GIBSON: I understand that, but it -- it is not specifically addressed in the Energy Employees Occupational Illness Compensation Act.

MS. HOMOKI-TITUS: I believe the only place the restricted information is addressed is the indication by Congress that the Advisory Board and NIOSH or Health and Human Services should have access to that information.

MR. GIBSON: And notwithstanding this opinion by DOJ, how can a claimant have a meaningful appeal to a dose reconstruction case when the Energy Employees Compensation Act does give them the right to appeal and ask for additional information, if they're not entitled to that information based on its classification? How can that be considered due process and fair -- a fair appeal?

MS. HOMOKI-TITUS: First off, the Energy Employees Occupational Illness Act does not give them the right to appeal a dose reconstruction. Those rights are provided through the regulations that are set up by the Department. We have an appeals process within HHS, as well as an appeals process, I believe, through the Department of Labor for dose reconstructions -- just so we're clear that the law does not give them that right.

MR. GIBSON: (Off microphone) I might

(unintelligible) --

MS. HOMOKI-TITUS: And I haven't studied this issue myself, but according to the Department of Justice opinion, as long as there's an administrative review and also then the courts can review the information in camera, that's met the question before. This is not the first program that's faced the question of rights regarding classified information.

DR. ZIEMER: Mike, do you have a follow-up on that at this time or... While -- while you're thinking, let me just add a comment here. It would appear to me that that opinion is directed toward the decision of the Secretary of Health and Human Services. It's not obvious to me that the Board cannot take into consideration issues of transparency in its recommendation. Whether or not the Secretary can use that or not --

MS. HOMOKI-TITUS: That's right --

DR. ZIEMER: -- may be a legal issue, but --

MS. HOMOKI-TITUS: -- absolutely, it is an opinion directed at the Secretary. It only addresses the legal question of using non-transparent information. It doesn't stop any

discussions that you all may have on other issues, on science, on the sufficiency of dose reconstructions. Obviously you're an advisory board and your job is to advise the President --

DR. ZIEMER: Our advice can be --

MS. HOMOKI-TITUS: -- or the Secretary on all issues.

DR. ZIEMER: -- taken or ignored. The other part of that is -- well, it appears that the opinion states that such a classification cannot be based solely on the issue of classification, that there should be some other issues which are enumerated and which should be addressed in making a final determination. But the Chair sees no reason why that issue of transparency could not be raised if indeed we felt that continued to be an issue.

Let's see, let's -- yes, a follow-up, Mike?

MR. GIBSON: But as it states in this handout that -- part of our role is to consider this and other information that we deem important to make this, and included in that is listening to the petitioners and their information. And based on what we've heard from them, I think

it's completely at odds with what NIOSH -- some of what NIOSH and ORAU's come up with on their assumptions and their dose reconstructions. So I believe with -- based on what the plaintiffs (sic) have told us and this issue that I have a great deal of heartburn about, lack of their due process, I believe we need -- we need to move on and -- and make the motion that they be granted the Special Exposure Cohort.

DR. ZIEMER: Thank you. Let's continue the discussion. We actually have already taken such an action, so the issue would be whether that is changed. Charles Leon Owens.

MR. OWENS: Mr. Elliott, what weight did the Department of Justice decision have in regard to NIOSH's supplemental report?

MR. ELLIOTT: I'm sorry, would you repeat that --

MR. OWENS: What weight did the Department of Justice advice have relative to NIOSH's supplemental report?

MR. ELLIOTT: What right?

MR. OWENS: Weight.

MR. ELLIOTT: Weight -- oh, weight. It had none, because we finished our supplemental

report before we heard of this opinion.

MR. OWENS: Okay, so I guess -- I'm just trying to understand the process by which the Department of Justice became involved, and I understand the comments from earlier, that you don't really know. And I believe Liz had said that she didn't necessarily know the process, either. I think, Dr. Wade, that the Board needs to have someone that can possibly provide information, because I think this issue will surface again as we go to the different sites. And I feel that it's an injustice for the Board not to have all available information, particularly something that is as critical as this, as it relates to confidentiality and the ability of dose reconstruction for the claimants.

DR. WADE: Understood.

DR. ZIEMER: Liz, did you have an additional comment?

MS. HOMOKI-TITUS: I was going to say I will be more than happy to try to look into that and find out what I can and let you all know at your next Board meeting, but I don't have those answers right now. I don't have that

information and I can't give it to you.

MR. OWENS: I appreciate that. But again, for something this critical, I feel that it's an injustice to the Board members and to the public for us not to have some type of trail to allow us information that's necessary.

DR. ZIEMER: Thank you.

DR. WADE: I will also take that as a responsibility, Leon. Thank you.

DR. ZIEMER: Jim Melius.

DR. MELIUS: Yeah. I find it a little hard to believe that somebody in the Department of Justice is out there reading transcripts of public meetings and here's -- I make a comment and suddenly --

MS. HOMOKI-TITUS: I'm sorry, I didn't --

DR. MELIUS: -- issue an opinion --

MS. HOMOKI-TITUS: -- say the Department of Justice took this up themselves. I said that I'm not --

DR. MELIUS: Well --

MS. HOMOKI-TITUS: -- aware of how it came to the Department of Justice so therefore I can't answer the question.

DR. MELIUS: Please, can you let me finish my

question? My question is, who -- did NIOSH bring this to the Department of Justice and ask their opinion? If not, do you know or does anybody know who did?

And secondly, do we have a written copy of this opinion?

MS. HOMOKI-TITUS: As I just said, I don't know who brought this to the Department of Justice so I can't answer that question. I would assume that NIOSH could address that they did not, but one of them would have to respond to that for you. And there is no formal written opinion, although it is my understanding that the Department will have a formal written opinion.

DR. ZIEMER: How was this transmitted to NIOSH, verbally or -- when you say it's not a formal written opinion, what do you --

MS. HOMOKI-TITUS: The Department provided a slide -- the slide that you saw -- to NIOSH after clearing it with the Department of Justice to ensure that it was in line with the opinion the Department of Justice had provided.

DR. ZIEMER: The opinion originally came to whom and --

MS. HOMOKI-TITUS: It came to the Department.
MR. ELLIOTT: I would add -- I would add, in response to Dr. Melius's question, that I am not aware of any requests from NIOSH to Department of Justice through our Department on this issue. I would also say that we brought this issue of disclosure/non-disclosure to the table in February, feeling that the Board -- we wanted to hear the Board's thoughts on it and wanted to hear the Board's input and -- and give that full consideration.
DR. ZIEMER: Jim, did you have a follow-up question?
DR. MELIUS: No, not at the moment, thanks.
DR. ZIEMER: Yeah, Wanda Munn.
MS. MUNN: As has been noted here already, clearly the Iowa site is not the only site on which the issue of classified data is going to come before us. Also clearly, from the outset of the formation of this Board under the law's instruction, the Department of Justice was one of the departments of the government that would be involved in this. It does not seem to me to be in any way detrimental to our purposes as a Board to have Justice rule on this matter. And

certainly here at the outset better than further down the road when we have encountered this problem on numerous occasions on numerous sites.

Sorry, I'm doing the best I can with the mike. Therefore, I fail to see why this is seen as a threat. Regardless of how Justice rules on this issue, it seem to me sooner or later someone -- we or someone else -- would have had to request such a ruling.

DR. ZIEMER: Thank you. Dr. Melius.

DR. MELIUS: Well, just to clarify, while there may be reasons for the Department of Justice or whoever to issue such an opinion, it's a little hard to deal with an opinion that comes down, you know, 5:00 o'clock on Friday, you know, just before our Monday meeting, that's not in writing, that we do not know the context in which somebody asked for this opinion, nor is it spelled out how it applies to the particular case that -- it's involved here, nor has, you know, NIOSH nor their legal counsel really had adequate time to try to address that and review it so that it can be of assistance to us. So you know, I guess Wanda may be right, it's

better to know about it now than later, but certainly the manner in which it was presented to us hardly is very helpful to our deliberations here. In fact it just adds further confusion.

DR. ZIEMER: Thank you. Henry Anderson.

DR. ANDERSON: Yeah, Larry, I think you said that the Justice opinion really didn't impact on your decision, which changed between -- as I understand it, the recommendation on February 4th, the first review that we actually acted on, and now, and you had supplemental information and while I can see the supplemental information is very helpful on the site profile concerned, the SEC petitions really are a time-specific thing. You have to -- you can't just -- as we've seen here, you're going to continue to look into the radon, there's -- this is an iterative process. But for the SEC petition, it is not. I mean we have to make a decision now, and -- and I guess my question is what -- on the NIOSH side -- changed so that your recommendation now on the petition is different than it was in February, if I understand it.

MR. ELLIOTT: Our recommendation on the petition is the same as it was in February. The recommendation that we presented in February indicated that we could do dose reconstruction --

DR. ANDERSON: Okay.

MR. ELLIOTT: -- for that class. We raised the question for the Board's consideration and deliberation on how to deal with this issue of disclosure or non-disclosure pre-1962 --

DR. ANDERSON: Okay, that's -- I just wanted to be sure you had not -- I've heard the impression that you'd changed, but the reality is that it really hasn't changed. It's simply we now have, you know, some other people weighing in on the issues -- on the legal side.

MR. ELLIOTT: That's correct. Our -- our recommendation has not changed since February.

DR. ZIEMER: Okay. Michael.

MR. GIBSON: Not to drive it into the ground or play attorney -- which I certainly don't want to do -- but just for the record, does anyone in this room know if this decision came down via phone call, e-mail or face-to-face meeting from the Department of Justice?

MR. ELLIOTT: All I can say in response to that from NIOSH is I received a phone call from Liz on Friday afternoon indicating that I needed to change my presentation today and add this slide, and that's -- that was -- that's -- the slide was sent to me by e-mail. That's all I can say from NIOSH's perspective.

MR. GIBSON: Secondly, I -- you know, I just -- you know, this process was set out to be -- to compensate victims of the Cold War that the government admitted has caused harm to, and to be claimant-friendly. And there is an adjudication process if you're denied your claim. And if you're denied access to the information, you have no due rights. This is -- this is almost a Constitutional issue, to me, and I -- you know, I think it ruins the whole intent of the program.

MS. HOMOKI-TITUS: Mr. Gibson is correct, this is--

DR. ZIEMER: I'm sorry?

MS. HOMOKI-TITUS: I'm sorry. I was just going to say Mr. Gibson is correct. At the last Board meeting the due process was brought up, which is why this would go to the Office of

Legal Counsel because they advise the government on Constitutional issues.

DR. ZIEMER: Okay, thank you.

MR. GIBSON: As a follow-up, again, I state I believe these people and everyone else in the nation that served this country has due process rights.

DR. ZIEMER: Thank you -- thank you, Michael. Sir --

MR. NICHOLSON: (Unintelligible) Nicholson. I'm with the University of Iowa. I just would like to know who provided you with the text for the slide that you miraculously --

DR. ZIEMER: Sir, this is not a public comment period. We're trying to --

MR. NICHOLSON: (Off microphone) Just a simple --

DR. ZIEMER: -- we're trying to ask the same question. Thank you.

Now we are going to hear yet from the petitioners themselves, and Dr. (sic) Anderson is here I believe this morning. I'm thinking, though, we do need a break -- comfort break. I'm sorry --

MR. ELLIOTT: Before you take a break could I

just add one minor comment to the record here, and it pales in comparison to what we're discussing, but yesterday I was referred to as Dr. Elliott and I haven't achieved that level of stature in my life and I just -- ethically I need to get that on the record so that Richard Miller knows I am not a doctor.

DR. ZIEMER: Okay. Mark has a comment. Thank you, Dr. Elliott.

MR. GRIFFON: (Off microphone) Actually -- actually it's for Larry --

DR. WADE: Larry, Larry --

DR. ZIEMER: Larry had a question --

DR. WADE: -- question's coming your way.

DR. ZIEMER: -- from Mark.

MR. GRIFFON: (Off microphone) Yeah, I -- I was waiting for those similar line of questionings to stop, but -- (on microphone) I had a question on -- is this on? -- a question on -- actually the definition of the class and whether the claims that you have for Iowa, whether you can make a determination as to whether the people who have filed claims fall into that class definition 'cause I know that doesn't have high explosives workers in it, for

instance. They're trying to segregate the AEC -- the nuclear work from the high explosives work when they define their class. Can you make that distinction in the claims that you've filed? Do you have enough information on -- on --

MR. ELLIOTT: The Department of Labor could make that distinction in their eligibility process. That's why they -- they establish that a person worked at Line 1.

MR. GRIFFON: Okay, so -- so they do have enough information to make --

MR. ELLIOTT: Evidently, 'cause they have been sending us claims, about 640 of them to date, so --

MR. GRIFFON: Okay.

DR. WADE: One comment before the break. I mean while this transparency issue is fascinating and we need to discuss it, it doesn't foreclose any options on the part of this Board. And I think it's terribly important that the Board continue its deliberations, if it wishes, on transparency, but also on the issue of scientific -- the potential to do dose reconstruction. It's

terribly important we discuss those issues and make the appropriate record.

DR. ZIEMER: Okay, we'll take a break. Try to keep it brief. We have a lot of ground to cover yet. Take about ten, okay? Thank you.

(Whereupon, a recess was taken from 10:20 a.m. to 10:38 a.m.)

DR. ZIEMER: Could you please reassemble? We're going to call the meeting back to order, since we are indeed pressed for time.

PRESENTATION BY PETITIONERS

We're going to hear from the Iowa petitioners, and specifically we'll give the podium to Dr. (sic) Anderson, if he's in the assembly.

(Pause)

MR. ANDERSON: All right, my turn. Thank you to the Board for giving us time and space --

DR. ZIEMER: Is the mike on?

(Pause)

MR. ANDERSON: All right, I'm dressed now. We can go ahead.

Members of the Advisory Board, thank you for having me back. It was so much fun last time I couldn't wait to come back and see you again.

(Whereupon, members of the audience indicated

an inability to hear the speaker, requiring a pause for adjustments to the microphone setup.)

MR. ANDERSON: All right. Good afternoon -- or is it morning? Hello, hello -- it works to the tap.

Be advised that all information contained in this response is available from public sources and contains no classified information. The Cold War team has sacrificed health and even their lives to provide this great nation with safety, security for the Cold War years for all Americans. At this time and in memory of those team members who have passed on, could I ask all here today for a moment of prayerful silence, using those good words from long ago -- each in your own words and each in your own way, let's bow our heads and pray, giving thanks to the memories of the heroic men and women of the Cold War team who have passed, and the sacrifices by their families.

(Pause)

Amen. Thank you.

Members of the Advisory Board, Department of Labor and NIOSH officials, fellow former workers and their families from the Burlington

Atomic Energy Commission Plant, also known as the IAAP/BAECP. Today we are focused on the responsibilities of the Advisory Board outlined in the Section 3626(b), which is -- and I quote -- advise the Secretary on whether there is a class of employees at any DOE facilities who were exposed to radiation but for whom it is not feasible to estimate the radiation dose, and on whether there is reasonable likelihood that such radiation doses may have endangered the health of the members of the class. It would appear to me that we seem to have agreement on all aspects of that statement, except for the portion for whom it is not feasible to estimate the radiation dose.

My story begins in the 1980's. I saw in the local newspaper, *The Burlington Hawkeye*, that one of my fellow shift lieutenants had contacted (sic) non-Hodgkin's lymphoma, fought a great battle and died. Then I was diagnosed with non-Hodgkin's lymphoma, received chemotherapy at the University of Iowa. I'm here today yet. From other friends I heard of two other exempt employees at the safety department of Line 1 who had been in the same

areas as the two of us had also contacted (sic) non-Hodgkin's lymphoma and had been diagnosed at about the same time. One of them died. The coincidence of four people having the same disease discovered within a short time seemed very suspicious, as our common ground was that we all worked at the plant at the same time. Here's a list of -- short list of names from the safety and security groups who numbered about 15 to 20 people over the five years that I worked at the plant. People like me, who were first or second into the closed, lead-lined train cars and trucks carrying radioactive cargo to the plant. These are people I've known, worked with and heard about recently.

Physical security shift lieutenants, Edmond Sonny Ryder, non-Hodgkin's lymphoma, died; Jim Selton, kidney cancer, living; Bob Flannagan, cancer, died; Alan Weeks, neurological disease, living; Paul Malloy, died; and myself, with non-Hodgkin's lymphoma. Security training officer Guy L. Miller was also there, cancer, died; security chief Richard Lewis, he inventoried pits in storage areas, has cancer.

The safety members I remember, John Jameson, non-Hodgkin's lymphoma, died; Paul Cross, non-Hodgkin's lymphoma, living.

As a physical security shift commander and holder of clearances AEC-Q, DOD secret and crypto at that time, I remember meeting armed AEC couriers who protected the incoming shipments of radioactive materials at the exterior gates. I was the first person to open and climb aboard the locked, leaded cargo carrier. I was charged with comparing the serial numbers of each item with the manifest and signing receipt for the cargo for the company.

To do so I climbed over and around and on many of the shielded white containers to get close enough to read each serial number while wearing my regular uniform, which then I wore home at the end of the shift. At home I was able to pick up and hold my two little girls before going to bed.

Now I ask you, since Sonny Ryder and I were the first to enter locked and guarded trains and trucks to inventory by serial number the radioactive barrels, would I have not received

a larger dose -- simply by being surrounded by a number of pits -- than someone who was only around a single pit? Granted, they were covered. No security guard that some 200 of us were ever badged.

I can't prove my dose, but NIOSH cannot, either. That's why there is an SEC petition coming through today, and it covers the years through 1974.

In the fall semester of 1997 while taking an evening class at our Southeastern Community College, my instructor for man and the environment gave a class assignment to write a letter to a government official in response to an environmental issue, either in support of that issue or against it. I decided that I would use that assignment to ask Senator Harkin a question that has bothered me since being diagnosed in 1988. Did I get non-Hodgkin's lymphoma from working at the Burlington AEC Plant?

Since that letter-writing I've heard from so many people who have worked there or from their surviving spouses about the same coincidences of cancer that was repeated all too often. In

most cases the disease announced itself 15 years after working at the plant. Sadly, at that time we could still not tell our doctors about the risks we faced.

I was proud to have been a part of the Cold War team. Iowans have a long history of answering the call for our country. We are prepared to continue to answer that call if this petition is denied. It is only right to expect that our country would protect us, as we protected them.

I note that the Board, while reviewing this IAAP site, has retained Sanford Cohen & Associates as technical experts to support your independent review efforts. However, the Board has to date been constrained in securing the services that would allow your technical experts to ask and answer specific questions involving Special Exposure Cohorts. I question why SC&A has been only brought on now. Why not earlier? Given that NIOSH issued its regulations almost a year ago, it's confusing why -- why now? Why not earlier? You people need tools to do your job.

We have a high degree of confidence in the work of Sanford Cohen and we appreciate the

diligence of them in producing this preliminary site profile evaluation for your consideration in a mere four weeks. There are an unknown number of boxes that no one has looked at in storage. There are an unknown number of boxes sent from the IAAP to Pantex that are likely lost or mis-boxed. We don't know. And we have new information about neutron dose measurements by PNNL, but this data has not been released and has forced NIOSH to rely upon Pantex data instead -- that apparently needs to be corrected in my speech.

The uncertainty about whether data has been lost or found goes to the heart of how confident one can be about dose reconstruction. The position of NIOSH is that dose can be reconstructed after 1962 despite a small fraction of the workers being monitored. In support of this NIOSH states in the SEC supplement item five, quote, based upon a review of records, workers who conducted other jobs, not assembly and disassembly, around the fissile materials generally were not monitored until about 1968. This is an error. Security guards were never monitored at all at IAAP, and

were not considered radiological workers in the complex until the late '70's. Thus this group was not monitored as asserted by NIOSH. They should know from this -- they should know this from worker interviews.

Quote two, as a result at IAAP the dose distribution developed from a moderate number of workers with the highest potential for exposure is considered claimant-favorable, especially when applied to non-assembly Line 1 workers. Well -- unquote -- this is in error, as well.

First, non-assembly Line 1 workers include both high explosive manufacturing, which did not have meaningful potential for radiation dose, as well as disassembly and security workers, which did have significant potentials. Second, the conclusions about whether these badges represent these workers with the highest dose is more in the vein of a NIOSH guess than a validated statement.

It is an assumption that those monitored were the most exposed workers, and that the readings derived were reliable, but not confirmed by SCA's review of the records. We know that many

workers were unmonitored, and many wore badges only part of the time. NIOSH faces a major impediment to asserting the representativeness of this data, because only a fraction of the radiation dose badges have codes that can be tied to actual job title or specific departments. As NIOSH has been informed, the only job titles identified came from employment termination records, and these are not reliable indicators of previous work history. Thus we are concerned that NIOSH is making unsupported generalizations.

For the post-1967 time period there's additional radiation badge monitoring, but there's no analysis linking monitoring to job titles or departments. Coworker models are not demonstrated to be workable in situations where there is so much uncertainty about job titles and departments. This is why an SEC is warranted through 1974.

If NIOSH is relying on the University of Iowa electronic database, we have been advised this database has not been quality assured. The representativeness of the data is the very heart of a critical point. Did that selection

of worker dose badges accurately represent the exposed work force, and I've indicated it doesn't, or was it concentrated among certain job categories such as supervisors, foremen, inspectors and radiographers?

The entire case for dose reconstruction appears to be biased on a house of cards. Data and information is alleged to exist, but not revealed. NIOSH offers reassurances that they have something to prove their position, but it is classified. NIOSH postulates that what the photon dose is based on monitoring of three to seven percent of the workers, and expects us to accept their dose reconstructions.

We have lived our entire lives seeing how classification has been abused. We have seen how something that is thought to be even embarrassing and it's inconvenient to declare it classified in order to hide it.

Between 1955 and 1962 records indicate that only eight to 23 workers in a work force of more than 1,000 were monitored for external radiation doses, and that included X-ray technicians. Neutron monitoring did not begin until 1962. Only 25 percent of the badges had

NTA film included to measure neutrons. This means that only 11 workers were monitored for neutron exposure from the years '62 to '67.
I normally only speak about two sentences and I run out of throat.
SCA apparently discovered that Battelle did neutron monitoring at the IAAP in the '70's only after talking to workers for a few days. NIOSH was apparently unaware of this monitoring after spending years at the Iowa site. Even more troubling is that NIOSH hired Battelle to work on the site profile. Is this a case of the right hand not knowing what the right (sic) hand is doing? Should we feel confident that Battelle has uncovered all the rocks? I get the feeling the NIOSH scientists would rather come up with theoretical models in their offices rather than get out and talk to workers and get ground true -- level truth.
Between 1970 and 1975, the high point in screening at IAAP, only 25 percent of the work force were screened for exposure to external radiation. We do not know exactly who they were or their location in relation to the radioactive sources. No new external data was

produced between Revision 0 and Revision 1 because none exist. The data is bad and NIOSH needs to admit that.

I note that NIOSH has found plutonium was shipped off site in drums. Although quantities were not large, how could that happen with pits when NIOSH asserts they were completely encapsulated? The stuff doesn't just jump out from it. Was this wipe sample from weapons components delivered to the plant? Is there evidence to support this, or is this just another NIOSH staff theory that -- which is back-fit to explain away an inconvenient bit of data and contradict their conclusion that plutonium pits were always encapsulated? If it was plutonium dust raised by a train or truck ride across bumpy roads at IAAP, how has NIOSH accounted for exposures to security personnel who went into trucks and trains to check the serial numbers? Where did the plutonium come from that was sent to Pantex? Has NIOSH reviewed the shipping information to find out what was in the drums? What percentage of health physics records have been examined by NIOSH that were shipped from Burlington to

Pantex in 1974? What percentage of those shipped has NIOSH even identified? What percentage has been lost or mis-boxed?

I would like for NIOSH to provide a number for the Board and petitioners on the number of boxes of records shipped from Iowa to Pantex -- Albuquerque -- Federal Records Center. How many of those shipped have been found and how many of those have been found -- has your staff reviewed? What would the rest of the records show? What was the method used in the selection and review of records? Were we just cherry-picking here and just picking up the little things that we like to see that point to the ideal result? How much confidence should we have if there's a substantial percentage of records that are missing? After all, there are no internal dose records from '49 to '75, and scant external records in '50's and '60's. Please explain.

Let me illustrate how dose reconstruction works using some sample props. This is theory. This is a Landauer film badge, the kind of badges we never wore. I got this from another source. Okay? Let me see if I can show our audience

dose reconstruction and how it should work. By using the canary in the mine shaft theory, the idea is that one person's film badge does the work for all. Let me help the visualization here just a little bit.

(Pause)

In this position -- let me hand Dr. Wade (speaker moves out of range of the microphone but continues speaking, then returns to the microphone).

In this position my badge would be the same thing that Dr. Wade is receiving from the purple pit. I would have brought more pits but there's only one in the house.

All right. Now in the next scene I will be the foreman for the group, or safety person. Remember, I still have the badge. Now I'm going to come walking in, walking back out.

(Pause)

(Off microphone) (Unintelligible) Lew, this thing fit? Everything (returning to microphone) working all right for you?

DR. WADE: Seems to.

MR. ANDERSON: Everything seems fine. Okay, I'll go check the next pit.

(Pause)

Now the badge I was wearing in and back out, does that represent the dose that Dr. Wade is still receiving? Do we know? Is he comfortable that my badge represents his dose? I don't think so. I really don't.

Now to illustrate the next point, that badge is in Texas. Does it represent what we're receiving now? I don't think it does. I think it represents the theoretical model of what could happen, what should happen. What did happen needs a piece of paper saying this film badge belongs to John Jones; this is what he received. Sit down and shut up. That's all it is.

If we had those things today, we wouldn't be arguing, we wouldn't be discussing. Okay.

I know that the Board has not received a portion of the SCA report container worker interviews, but I believe once published NIOSH will need to respond to worker experiences at the IAAP which conflict with their hypothetical work factor. For the pre-1963 cases NIOSH admits it has too few records, so it developed a generic nuclear weapons pit and applied a

classified work factor to estimate external radiation dose. NIOSH assumes workers were exposed to nuclear weapon pits a mere 15 percent of the time, or one hour a day. That's bad. Worker interviews contradict that conclusion. This creates a credibility gap between the reality of the workers and the hypothetical estimates of -- by NIOSH (unintelligible) decades later.

Congress did not intend that NIOSH create theoretical models and hypothetical source terms, no matter how claimant-favorable, because it lacks access to real world measurements. This is precisely the situation for which Congress created an SEC. There's nothing robust about the dataset for Iowa. While theoretical models may be okay for an academic paper, I cannot see how NIOSH can do anything more than a wild guess. We're learning that NIOSH's assumptions, no matter how well-intended, do not match the reality checks from the workers.

A few worker interviews by the auditor uncovered so much information in such a very short time that it calls into question the

credibility of many of the assumptions by NIOSH. The only time NIOSH responds and discloses anything is that if we call on them -- as if we call them on it as it was done last summer at the public meetings requested by Senator Harkin. How can we have believable information with a funny way of doing business? If we don't catch you at it, then you don't respond. Gee, it'd be nice to have this up front.

The cynical person might think this is a plan to wait us out until the mortician resolves this problem, or is this just plain old bureaucratic slight of hand. Is this just a promise for relief that was never meant to exist? I don't know.

NIOSH's site profile uses different assumptions for those employed in the pre-'63 time period compared to those employed after. This creates inequities in the outcome of compensation decisions and casts doubt on its credibility. For example, a worker employed from 1958 to '62 with pancreatic cancer will be compensated with a 58 percent probability of causation. But a worker employed from 1963 to '67 with

pancreatic cancer will receive a seven percent probability of causation. If you're one of those seven percent, it's not probable anymore. A woman with breast cancer employed for two years from '61 to '62 would get a 52 percent probability of causation. However, a woman employed five years, from '63 to '67, would have only a 16 percent probability of causation.

The irony here is that the risks did not increase or -- I'm sorry, the risks did not decrease from '62 to '63. The workers don't know that anything changed from '62 to '63. They're still doing the same jobs, a little more of it. But yet the numbers take a dramatic jump. Dose calculations result in an eight-fold reduction in probability of causation. That doesn't -- that doesn't meet with my approval. This is the product of using classified information, theoretical models and skimpy data.

The Act was enacted -- the Act as enacted provide timely, uniform and adequate compensation, but this kind of outcome doesn't meet the test of uniformity. It doesn't meet

the test of anyone's fairness. And it sure doesn't meet timely. Since I started -- raised the first flag in 1998 -- '97, over 400 people have passed on, waiting for this moment.

I was there. Fellow employees were there. NIOSH was not there. Pantex was not there. We are the reality of this situation. We were the canaries in the mine shaft known as the IAAP. And as I look back over time, all I see is a trail of dead and dying canaries that lead directly back to the IAAP.

As the Board debates this important issue before them today and in the future, keep in mind the human faces of the people involved. Life is not just numbers on a paper. Life is flesh, blood and spirit. Remember many people are no longer here. Remember the sacrifices they made and will continue to make. Mostly remember how long we've already waited.

I wish to offer my thanks for the active participation of Senators Harkin, Grassley and their staffs from Iowa, the continued interest of Representative Leach, and the ongoing concern from Senators Obama, Durbin and Bond as they, too, have constituents from the tri-state

area who worked at and were injured at IAAP. Personal thanks for my wife Kathleen for her continuing support over many years. It's been rough.

Again, I strongly urge the Board to act today to recommend the inclusion of all eligible workers in a Special energy -- Special Exposure Cohort. Enough is enough. The Board has seen enough foot-dragging, paper-hanging to last a lifetime. Please ensure that it finds its way to HHS Secretary Mike Leavitt in a timely manner.

Now Mr. Chairman, to sum up my response I direct the Board's attention to Dr. Laurence Fuortes whose years of work and dedication have brought focus and meaning to the Cold War team at Iowa. Dr. Fuortes is a medical doctor, professor at the University of Iowa, is responsible for the Burlington Atomic Energy Commission Plant former worker program. Dr. Fuortes has been working with the Cold War team for several years now, learning about the processes, risks and health outcomes experienced by the workers. Thank you.

DR. ZIEMER: Thank you. Thank you very much,

Robert Anderson. I -- I was wondering if you're available to help me teach students at Purdue University.

MR. ANDERSON: I am retired.

DR. ZIEMER: He is retired. Very -- very good. Dr. Fuortes, are you going to add some comments? Please, use the mike or the podium, whichever you prefer.

DR. FUORTES: Well, I'm trying to address you guys so I think I -- I'll sit here -- or stand here and I'll try to be brief because many of the technical issues I think have been addressed by SC&A, but the former workers I think have done a great job of clarifying some of the concerns about the representativeness of data.

You know, following Bob I feel like to keep you guys awake and entertained I'm going to have to play the accordion and tambourine with my knees. Bob, that was fantastic and I think a very good example of some concerns regarding representativeness.

You guys are doing a fantastic job and I'm amazed -- I know some of you guys haven't slept in your own bed in quite a while. You've been

traveling, addressing issues of the Department of Energy workers' health concerns for quite a while now. And we're here today, as you guys have noted, because of this change from the Rev. 0 to the Rev. 1 from the time when you really did make a recommendation that the SEC was appropriate. And I'm not an attorney, I don't play one on TV. We have real attorneys here. I can't cite the language of this regulation and Act, but I can -- I think I can repeat the intent. And the intent appears to be that SECs should be awarded where there's a lack of accurate and sufficient data from or relevant to a site from which to perform dose reconstruction accurately, fairly and in a timely manner. So I think there are a number of criteria other than just, you know, that there's the health risk and the feasibility. I think that feasibility boils down to a lot of things that we have to consider in terms of -- of this process.

The accurate data assumes -- there are -- I think there are some assumptions. There's some difference in NIOSH's assumptions regarding the accuracy, validity, representativeness of data

with some of -- some of the rest of us.
You noted that there is no new data since the April meeting in St. Louis, so what changed from Rev. 0 to Rev. 1? What changed was NIOSH a -- was asked, after critique of Rev. 0, to please talk to the workers because there were inaccuracies, that workers' histories really did not assumptions made in Rev. 0. On the basis of those worker histories, which were not many. I have to tell you that this -- these were small town hall meetings and a couple of -- of follow-ups, but still they -- they did a good faith effort I think in responding to our concerns regarding Rev. 0. The response was to say okay, there are -- there are potential worst case scenarios involving naked pits or -- or radiation exposure. We'll adopt that in the era prior to any radiation badge monitoring. So only for the era prior to any monitoring at all.
Another statement in the -- or clause, I guess, in this SEC language is that any uncertainty -- or in the dose reconstruction, any uncertainty in dose is to be resolved in favor of the claimant. And I think -- SC&A said it -- that

everybody's -- has -- understanding that they made a great good faith effort in being claimant-favorable in the pre-1963 era. But post-'63 there are some -- some issues.

Dr. (sic) Elliott -- Larry Elliott stated in one of his slides just a moment ago, workers who routinely handled the most radioactive materials were routinely monitored post-1963. Statement of fact. I -- I don't know. We also saw the table showing that in 1963 it was at -- '63, was it 29 or 41 workers monitored -- 41 workers, and we have the workers telling us at least 120 were working in the bays? Well, that says that some workers with exposure were monitored, certainly. But the accuracy of the statement, workers who handled the most radioactive materials were routinely monitored, I think is not a factual statement.

It's -- it's -- it's almost, to me, an attempt to sway the Board, the use of language. There's some very selective use of language in statements of fact that I would not agree are based on or supported by -- by the facts. And -- and it may be that it's a reflection of a different assumption of what the scientific

process is between my assumptions and -- and NIOSH's. But I had discussions with OCAS about this very issue, and the reason I'm concerned about -- that this swaying the Board is that I think -- we heard statements today of the Board being told what their duties are by NIOSH. My -- my impression was you guys are an independent board, you're like a scientific council. You don't respond to a -- a -- to NIOSH, you -- you address concerns and you -- you are -- are there really to be not just -- there -- being an advisory board is a difficult situation, but you're not there just to rubber-stamp their decisions. And then you're doing a fantastic job I think of being very, very credible and -- and objective in this process. But I am concerned about some of those statements that I heard. It could be that it's just perceptions.

But perceptions really do mean something and that brings me to some of the other perceptions. I have to reiterate some of the history. NIOSH was advised regarding our concerns regarding the adequacy of exposure back in 2001, both -- repeated letters and

telephone calls. This isn't a six-month process of review. This is a four-plus-year process of discussion of -- of inadequacy of data.

In the meantime, what happened from Rev. 0 to Rev. 1? Hundreds of claimants have filed for cancer and every single one of those cancer claims that has been reconstructed has been denied -- every single one. I'm wondering if there is some implication that instead of good science dictating good policy we have a concern, at least a perception, that a policy might be dictating how we interpret data. And that -- that's a -- that's a concern I have here because now what's happened is that after Rev. 1 we have de facto SEC for all the workers prior to 1963.

I've run all the IREP models for the 22 cancers and -- and it's a very generous model, so we have a -- basically a de facto SEC. Everybody but -- but squamous cell skin cancer, you know, is -- is going to show up in the IREP models as having a POC above 50 percent.

Post-'63, no one. The only ones that come out are lymphoma and leukemia. That's work -- for

working 12 years, actually. So one year compensates the majority of people. One year's work compensates the majority in '62. Post-'63 you can work for all the 12 years through 1975 and you don't get compensated.

So I just have some questions I wanted to put on the record, questions about the process. I -- I know -- not the process you guys are doing. I think this is a fantastic thing, but I think that some oversight of what's been going on in terms of the policy -- you guys brought up issues of Department of Justice. I agree with you, Dr. (sic) Munn, that Department of Justice has to weigh in. But if there's any implication that somebody is using policy from a political stance to affect the Board, I think that that's probably a concern, a perc-- even if it's just a perception, it's a concern that we should get on the record and I'm glad that some of you did note that.

Last issues, I -- I think that you guys have really -- really addressed most of this, but -- but I do want to reiterate that my impression was, after reading the letter that the Board sent on, was that you made a decision regarding

recommending an SEC -- you had four bullets, and the second bullet was on the basis of concerns regarding the technical adequacy of data. I -- I did call OCAS to discuss this and I was told blanketly (sic) -- and I think that we saw the impression, the perceptions are different. OCAS seems to believe that the SEC was approved on the basis of transparency. I -- I tried to make this point in St. Louis and many of you reiterated that in your deliberations, transparency is one issue and it has certain implications in terms of due process, and that may have implications at other sites, as well. But what we're discussing here is the credibility of a small sample of -- of whatever we talk about. If we talk about the highest exposed workers and we have zero in -- in disassembly workers or guards who were highly exposed, that's a very small sample. That's a zero sample. And if we have a -- a minimum of -- you know, 15 out of 120 workers who worked in bays -- we know worked in bays, just statistically, that's not a large sample, either. So the representativeness of data I know did affect

some of the Board's decision last time. That's -- that was reflected in your letter. So I just want to get that on record that I think I'm hearing a difference in perception on several points regarding what NIOSH views as their role in establishing policy and what -- what I think the intent of the Act is. Thank you.

DR. ZIEMER: I'd like to give the Board members to -- the opportunity to raise questions, either from Robert Anderson or Dr. Fuortes. Michael?

MR. GIBSON: (Off microphone) (Unintelligible) (on microphone) specifically to raise questions to them I guess just to follow up a little bit on what they're saying about the adequacy of the -- the records and stuff. I'd like to refer back if I could for a moment to the presentation on the IAAP TBD that I believe Mr. Taulbee had the other day. Specifically on page 13, the pie chart that was shown, I guess -- you know, in looking at this it raises a few questions that -- it says 40 workers from a single dosimeter cycle in 1965. I wonder why one particular snapshot in time was taken

rather than showing a year's worth of data. And secondly, you know, when you add in -- I'm a former DOE worker, and when you add in AEC workers into the mix, when you add safety people into the mix, just as Mr. Anderson demonstrated, typically those type of people -- they walk in and out of a room -- if once daily, it's for half of an hour, but more typically they -- the AEC people and DOE people, you might see them once a week. And I think that -- that lowers the overall value of the dosage of the workers that are in there for 40-plus hours a week, and I'm -- so I wonder if perhaps someone could explain, you know --

DR. ZIEMER: Perhaps Tim Taulbee could clarify the question on -- did you understand the question that was being asked?

MR. TAULBEE: Yes, I did, Dr. Ziemer. To answer your question, Mr. Gibson, is the snapshot in time was just to try and get a -- a feel, because this was a question that was raised by SC&A of how sure were we about that the highest exposed workers were monitored. I certainly could do it for all the dosimeter cycles over all the time from 1962 through

1974. This was just to give a relative snapshot so the people could get a feel that they were monitoring the workers, who I had interviewed, who I had talked to, and I saw those dosimeter names. I knew which departments roughly they worked in. I didn't know all 40 'cause I certainly didn't talk to 40 different workers during my deliberations, and so I wanted to get a snapshot of that.

DR. ZIEMER: I suppose the question would be how representative is this of the overall picture or how consistent is it from one time to another.

MR. TAULBEE: With the --

MR. GIBSON: And secondly --

MR. TAULBEE: I'm sorry.

MR. GIBSON: And secondly, just -- again, when you add in people that are in a room for ten minutes or in a room once a week, that seems to lower the overall value of the dosage of the people that are there weekly.

MR. TAULBEE: That's correct, sir. The safety and the AEC folks basically made up the vast majority of the zeroes, which we dropped out of the analysis.

DR. ZIEMER: Thank you. Dr. Fuortes mentioned something about the -- he's run some numbers and you brought up the issue of the skin cancers in the one case versus the situation in the Special Exposure Cohort. I wonder if anyone from either NIOSH or perhaps ORAU could clarify the impact on -- if you had a Special Exposure Cohort that -- does that -- that excludes the skin cancers, I believe, and what would be the impact of one versus the other?

DR. NETON: This is Jim Neton from NIOSH. Skin cancer is one of the non-presumptive cancers, as is prostate and few others. If -- if the site were to be a Special Exposure Cohort, those cancers would not be automatically granted compensation under the conditions of the statute. There are very large doses, as has been pointed out, in the early time periods of this model, particularly 19-- up to 1962. And in some of the runs I believe that Dr. Fuortes has -- has had us perform, it appears that skin cancers and even some prostate cancers are likely to be compensated under this program if the model stood as is. If -- if it's decided that dose reconstructions cannot

be done, I'm not sure what the fate of those decisions would be.

DR. ZIEMER: Thank you. Mike, did you have a follow-up?

MR. GIBSON: Yeah, I just wondered if -- I'm not -- certainly not the scientific one. I just wondered if our contractor would like to make any response to what I was trying to get across with -- with Mr. Taulbee and how that may affect the overall results.

DR. ZIEMER: Someone from S-- yes, Hans Behling.

DR. BEHLING: Yeah, I believe that Mike brought out the point that I was trying to make this morning, and that is the assumption of people who were monitored being representative of the maximally exposed worker group has to be questioned based on the fact that we have data here, at least on that pie chart, and testimonies presented by workers saying that the people who were really most likely to have been awarded a badge for -- for exposure monitoring were not necessary (sic) the pit one workers, and yet we are -- or the implication is that the data -- post-1963 data is in fact

those involving workers who were maximally exposed. And worse yet, it was that data that's imbedded into the pre-1962 pit model. So one has to be very careful about what we're looking at. And of course the concept of cohort badging that I was referring to really dilutes the exposures, at least for the maximally exposed individual group, meaning Line 1 workers, so one has to be very cautious here.

DR. ZIEMER: Thank you. Wanda Munn has a question or comment.

MS. MUNN: A simple matter of clarity. I am not Dr. Munn. A simple nuclear engineer.

DR. ZIEMER: We're awarding degrees today.

DR. WADE: Paul, could I make just a very brief statement, just in terms of timing and to try and remove some of the timing pressure. While we're supposed to break very quickly, we can continue to work into lunch. We have the ability to bring lunch in if that's necessary and work through lunch. We can delay the start of the proceedings this afternoon to allow more time for this discussion to happen after lunch. While we have a busy agenda, including some

items on the agenda that don't relate to Iowa or Mallinckrodt on Wednesday afternoon, we could compress that activity and take more time. So it is terribly important that you make a complete record and I don't want you to feel time pressure. There are many things that we can do to give you the time that you need.

DR. ZIEMER: Indeed, if necessary we can continue deliberations even after lunch. There've -- there've been some conversations with some of the Mallinckrodt folks and they understand that and they're willing to delay the start of those discussions, as well, if necessary.

Jim Melius.

DR. MELIUS: I don't know if you want to try to settle -- I was not going to speak to the issue of lunch, so if you want to try to -- do you want to continue to deliberate now or --

DR. ZIEMER: I think we can at least go till noon, if necessary, and --

DR. WADE: More, if necessary.

DR. ZIEMER: -- we were looking into the possibility of having box lunches available.

DR. WADE: It can be done.

DR. ZIEMER: It can be done for Board members. What about others? They'd prefer not to eat out of those boxes then?

UNIDENTIFIED: (Off microphone) (Unintelligible)

DR. ZIEMER: Okay. Well, in any event, we --we can -- we can continue for a bit now, perhaps till the noon hour. Then we will take a break if we have not completed our deliberations on Iowa and we'll resume them after lunch. Again, let me ask for questions, and then I would like to take a moment and clarify what we need to do as a Board.

DR. MELIUS: Well, I really want to speak to the second point, so if there's --

DR. ZIEMER: The second point being what we need to do.

DR. MELIUS: What we need to do --

DR. ZIEMER: Okay.

DR. MELIUS: -- and a recommendation that I --

DR. ZIEMER: Let me ask for any more questions or comments relative to the information provided by the petitioners.

(No responses)

BOARD DISCUSSION: IAAP SEC PETITION

DR. ZIEMER: Okay. Then let me kick this off and Jim, you can add to it then. To clarify what options are before us or what actions we need to take as a Board, there is -- or remains a previous action which this Board took at its last meeting. I point out that that previous action was linked, to a certain degree, to Rev. 0 of the site profile. So it may be that if the Board wished to retain that action, there may be some modifications that would be needed so that there was a more specific link to the updated site profile. But in essence, one option would be for the Board to retain or reaffirm its prior action.

Another option would be for the Board to in some way modify its prior action. There -- there are a number of ways in which such a modification might be formed. It might take the form of looking at action by years.

Another action would be for the -- another possible action would be that the Board recommended that there not be a Special Exposure Cohort and that in fact concurred with the recommendation of NIOSH.

Another possible option would be for the Board

to delay further action pending receipt or evaluation of whatever information or data or other -- well, let's say other information that the Board may wish to have to help it make its decision.

So there are a number of possible options before us. As we consider those, I'd remind you also that, aside from the issue of transparency -- which I maintain still could be discussed and considered by this Board in some fashion -- it's important that we address the issue of the feasibility of estimating dose with sufficient accuracy. We may wish to go on record on the health endangerment issue, if that becomes part of the recommendation. I think we have in a sense done that, but nonetheless that would need to be reaffirmed. Perhaps the timeliness issue would come into play. These are things that we need on the record, regardless of the recommendation that we make, so that it can be made clear in our recommendation as to the basis for which we make such a recommendation.

Having said that, let me ask Jim Melius, who is always very articulate -- can I -- I can even

call him Dr. Melius and he will -- and I say this seriously -- to add some thoughts to this. You've thought about moving forward on this issue and I'd entertain whatever remarks you may wish to add.

DR. MELIUS: Thank you, Paul. I would --

DR. ZIEMER: You'll have to address me as Dr. Ziemer, too, then.

DR. MELIUS: Yeah. I would like to recommend a course of action, and I guess the premise for this is really the same premise we had at the last meeting in the sense that the Board, I think in reviewing these petitions and the evaluation of the petition, has to deal with the information before us at this point in time; that we can't sort of keep looking ahead to what might be done or what may be done at some undetermined point in time, nor -- I don't think it's fair to the petitioners, NIOSH or anybody involved to sort of keep doing that. So we base our recommendation on what's before us at a given point in time.

I also would add that I think we have to be very careful of this transparency issue, also. And I think it -- I think we have to make it

very clear what the basis for our recommendation would be and that if we are going to use transparency that we word that very carefully. In fact, my recommendation is that at this point we do not do that until we have a better understanding of -- of the implications of that decision, and I'd like to offer a separate motion later on that -- to try to address that issue.

So what I would like to recommend and what I've actually started to write up is really a modification to our last letter, what we adopted at our last meeting, and the modifications have to do with writing a little bit more detail on the basis for that recommendation, as well as trying to address some of the issues over, you know, time and what information we have -- have before us.

And I guess -- I would be glad to read that. I have it written here that -- I think we could -- may be able to work out something and make copies available for people.

DR. ZIEMER: What I'm going to suggest is that you get your motion on the floor. We will have an opportunity to have some preliminary

discussion. Perhaps during the break -- the lunch break we can get it in writing. I think it would be important for us to have it in writing, and then formalize any action on such a motion immediately after lunch, if that's agreeable. Proceed.

DR. MELIUS: Okay. The motion -- the beginning of the motion really -- I guess you'd call it the preface -- is -- I think it addresses some of the issues that came up between these two meetings, and so the beginning is (reading) The Board recommends the following letter be transmitted to the Secretary of DHHS within 21 days. Should the Chair become aware of any issue that in his judgment would preclude transmittal of this letter within that time period, the Board requests that he promptly inform the Board of the delay and the reasons for the delay, and that he immediately work with NIOSH to schedule an emergency meeting of the Board to discuss this issue.

I recognize that -- just parenthetically -- recognize that we had talked about discussing this issue in more detail, but I think we need to --

DR. ZIEMER: Indeed, that's --
DR. MELIUS: -- at least get some procedures --
DR. ZIEMER: -- very helpful, regardless of what the recommendation is.
DR. MELIUS: Yeah, right. Okay. The letter would be as follows, and this first paragraph -- essentially the same as the one from the -- we adopted at the last meeting. (Reading) The Advisory Board on Radiation and Worker Health, parentheses, the Board, close parentheses, has evaluated SEC Petition 0006 concerning the Iowa Ordnance Plant under the statutory requirements established by EEOICPA and incorporated into 42 CFR Section 83.13(c)(1) and 42 CFR 83.13(c)(3). The Board respectively (sic) recommends a Special Exposure Cohort be awarded to all Department of Energy contractor or subcontractor or Atomic Weapons Employer employees who worked at the Iowa Army Ammunition Plant Line 1, which in-- parentheses, which includes Yard C, Yard G, Yard L, Firing Site Area, Burning Field B, and storage sites for pits and weapons, including Buildings 73 and 77, from March 1949 to 1974, and whom were employed for a number of work

days aggregating at least 250 work days, occurring either solely under this employment or in combination with work days of employment occurring within the parameters, parentheses, excluding aggregate work day requirements, close parentheses, established for other classes of employees included in the SEC. This recommendation is based on three specific factors.

The first factor, all employees identified in the petition worked in one of the earliest environments where nuclear materials were handled.

Factor number two, there are limited monitoring data available at this facility during the time period involved. Even when a personal monitoring program was implemented, most workers were never monitored and the representativeness of these data has not been established. In addition, personal exposures in some job categories with significant radiation exposures were never monitored.

There are also serious uncertainties regarding the monitoring techniques in place at the time, with the evaluation of radon exposures at the

facility, with the basis for calculating the neutron to photon ratio, and with the evaluation of exposures from some sources of exposure, parentheses, for example, the so-called pits, close parentheses. These limitations and deficiencies cause a number of difficulties for performing individual dose reconstructions.

Third factor, at our February meeting NIOSH concluded that it is likely that radiation doses at the Iowa Ordnance Plant during this time period could have endangered the health of members of this class. The Board concurs.

Based on these considerations and our discussions and deliberations at our February and April Board meetings, the Board recommends that this Special Exposure Cohort petition be granted.

And I'd like -- these are -- next two paragraphs are taken from our last decision. They're identical.

(Reading) In addition, the NIOSH evaluation of the petition defines a class of employees who worked from June 1947 to May 1948 prior to the introduction of any radioactive materials or

radiological procedures at Line 1 of the Army -- Iowa Army Ammunition Plant. For this class NIOSH determined that no feasibility determination is necessary because members of this class received no radiation doses as covered by EEOICPA. The Board concurs with this determination.

Next paragraph, (reading) Finally, the petition and evaluation also addresses a potential class of employees composed of industrial radiographers who may have conducted radiography on non-radiological high explosive weapons from May 1948 to March 1949. NIOSH plans to issue a separate evaluation report addressing this potential class in the near future. In the context of this petition and evaluation, the Board concurs with this decision.

DR. ZIEMER: Thank you. You've heard the motion. Is there a second?

DR. DEHART: Second.

MR. GIBSON: Second.

DR. ZIEMER: Thank you. Now just procedure-wise, I would like the mover and seconder to specify that this motion is to take the place

of the action that the Board took at its previous meeting. Parliamentarian-wise, I'm not necessarily asking that we rescind that action since -- if this motion passes, it would in essence replace that, and that is your understanding?

DR. MELIUS: Yes, it --

DR. ZIEMER: The mover and the seconder?

DR. MELIUS: Yeah.

DR. ZIEMER: Okay. Then this motion is open for discussion and we'll -- we'll carry out discussion for about 15 minutes. If we're not ready for closure, then we will continue after lunch. Wanda Munn.

MS. MUNN: Now I know what Dr. Melius has been doing all morning busily on his computer. I have concerns about his item number two until we have this in written format so that we can actually look at the wording. My concern is based on the fact that what we do here affects the cohort of the Iowa group, but also establishes some sort of standard by which we may make future decisions. I know it's very difficult for the petitioners to continue to have us withhold any final judgment, but it's

also difficult for them to understand that we have 200 different sites that we're concerned with, and people at each site.

That being the case, it is of real concern that NIOSH has given us their perception that they are capable of doing a fairly good job, as good a job as can be done, with dose reconstructions. And dose reconstructions, contrary to information that may be believed, does not mean that applications will be denied. Our experience with previous dose reconstructions does not support that. So I would like for us to seriously recognize that, should we accept what I believe I heard Dr. Melius say at face value, then what we are saying is we do not believe that NIOSH can in fact fulfill the requirement for just dose reconstruction.

So I would -- although obviously we must discuss all portions of this, I certainly do not feel that -- that a final consideration can be taken until we have this in hard copy and we have discussed it further.

DR. ZIEMER: Thank you. Actually item two I believe had a number of sub-parts to it. You

may want to look at specific ones of those. Also I hope it would be clear that one is not necessarily saying that NIOSH can't do what they say they can do. I think Dr. Fuortes perhaps raised a good point, however, and that is kind of the issue of equity through this cohort. If you use the dose reconstructions for those early years, the -- it's almost un-- a -- almost a default SEC because of the high doses, and there is that kind of issue built into what we've seen today. Perhaps unique to this facility, we don't necessarily know. And I think as Dr. Melius indicated, we are in a sense forced to work with what we have at the moment, which I -- I -- I have a fair level of confidence that if we had another ten years to get to Pantex and all these other places and -- we -- we could figure out all these things. We could even -- you know, there's just all kinds of things that brilliant people can do, given enough time. But time is of the essence here. I think Leon is next, and then Jim, you had another response.

MR. OWENS: Dr. Ziemer, I just wanted to say I think that Mr. Anderson did an excellent job

with his presentation, as did Mr. Elliott for NIOSH. I speak in favor of the motion. This Board has had deliberations in St. Louis in regard to this Special Exposure Cohort petition. We've had deliberations here. We talked about this transparency issue. But to me the predominant issue now for the Board is credibility, and I think the claimants that are here deserve action. The petitioners deserve action. I think that the best available evidence, documentation, was presented by NIOSH -- that they had -- in St. Louis, and the Board acted on that. I think each time that we travel to a site, the decisions that the Board makes, the deliberations that they make are based on the available evidence at that time, the best science that might be available. And so once we made a decision, we need to stand by that decision. That's all that we do have is credibility. We're not the Department of Energy. We're not any of the other Federal agencies. And if we cannot maintain our credibility, then we lose the faith of the claimants to do the right thing.

DR. MELIUS: Yeah, just two -- one -- one just

for clarification, regard to Wanda's question, was what I tried to do with that second factor was really tried to capture the major reasons why we doubted that -- had concerns that NIOSH would be able to do individual dose reconstructions and why we did -- we believe they were not feasible to do with sufficient accuracy, and essentially capture some of the discussions we've had here over the last two days as -- as -- for those reasons. And I agree, it -- I think it's a lot easier to address these issues when you have something in writing in -- in front of you.

Secondly, I -- my understanding is that Congress did set a limit on evaluation of the SEC petitions, at least in -- as far as NIOSH's role, and I believe, if I'm correct, NIOSH has 180 days from the time of certifying a petition to prepare and present an evaluation report to the Board. Is that correct, Larry?

MR. ELLIOTT: You are somewhat correct, correct. It's from the time of qualification for evaluation until we present a -- an evaluation report to the Board, 180 days.

DR. MELIUS: And even though that, I don't

think, technically applies to the Board's deliberations, it's certainly an implication for us not to -- not to stretch this out through a whole series of iterative processes and so forth, without good reason. And I think in some sense we are recommending in this -- we did last time -- that -- that at least for the radiographers there really is not enough information now to act. But I think we -- otherwise we really have to try to do this in a timely fashion, to the extent possible. And I also don't think that our action really questions the sincerity or the effort made by NIOSH's staff in doing this. I mean I'm very impressed with what they've done and in their openness and willingness to share with us what the limitations and -- as well as the -- the basis for what they've done. But again, we have to work with within the context of what's available to us at the present time.

DR. ZIEMER: Okay, thank you. Henry, you have some additional comments?

DR. ANDERSON: Yes, I just want to speak in favor, as well. And I think one of the things that our -- our job here is, as we're finding

out, there's no bright line of typically a yes or a no, or many of these are not going to have a bright line. I mean if there's absolutely no information, then it becomes clearer that most of those sites have been handled in the original legislation. So I think what we are -- our job is to begin to define when is it sufficiently accurate. I think what NIOSH did a good job on is they have gone to the maximal side, and I think what we've seen in the display of the data is that that maximal number begins to truly press the sufficient accuracy issue. And so I -- I think, you know, the weight of the evidence in this instance is in favor of the SEC petition approval. Thank you.

DR. ZIEMER: Yes, Michael.

MR. GIBSON: I also speak in favor of the motion. I don't question the abilities of NIOSH and the work that they've done. Based on the limited data, it is somewhat speculative and subjective. But I would also point out that in the limited amount of time that our contractor has -- has had a chance to look at this, they've -- they've presented, at least in my opinion, sufficient evidence that there's --

is doubt whether a dose -- an accurate dose can be constructed. And so I think this has drawn on long enough and we've debated it and it's time to move on with the process.

DR. ZIEMER: Thank you. Okay, others that wish to speak either for or against the motion?

DR. MELIUS: I just wanted to --

DR. ZIEMER: Are you going to speak for the motion?

DR. MELIUS: Yeah.

DR. ZIEMER: Okay.

DR. MELIUS: Just one point of clarification. The original letter included a fourth factor, which was the transparency issue. That's left out of this. And I believe that, based on what we've heard from the members of our Board who are -- have the appropriate clearances, from our contractor and so forth, that the factors that are outlined here are -- take into account the classification issue in a sense. It's not a factor in why we're -- why we're going forward with this particular petition at this point in time.

DR. ZIEMER: And I might point out -- or remind the Board, although our original action did

mention issues of quality of data, there was indeed a bit emphasis on transparency. In fact, there were many of the members here who indicated that they voted primarily on the basis of the transparency issue, thinking that it was sort of immaterial on the others anyway since it was kind of a moot point. Now what -- with this motion, the focus has gone more on the other issues, the issues of the quality of information, the dose reconstructions themselves, the timeliness factor, those other factors which indeed are very pertinent to -- to the decision.

We -- we recognize, based on what we heard, that the transparency issue itself could be problematic for the Secretary in any event. If indeed dose reconstruction were done, apparently even though there is that issue, an ultimate -- what's the word I'm looking for? I guess an ultimate challenge by a petitioner on a decision could go to the courts where classified information could in fact be revealed in an appropriate way, so that may not be an issue in any event. But now the focus is away from that and on to these other issues.

Any further discussion -- I think in fairness -- it's been asked that we have this in writing before we take action, and in order to keep everyone around here, come back after lunch and learn what the vote will be. We're going to recess approximately one hour. A few comments from Dr. Wade before we leave.

DR. WADE: Yeah, I'd like to make just three comments. Again, certainly without bias, just so the record is clear, this Board will make a recommendation to the Secretary and the Secretary will decide. In between, as laid out in the SEC rule, it states in 83.16 that the Director of NIOSH will propose and transmit to all petitioners a decision to add or deny classes of employees to the cohort. This proposed decision will take into account -- and I've read this to you before -- the evaluations of NIOSH, the report and recommendations of the Board, information presented and submitted to the Board, and the deliberations of the Board. So again, it's terribly important that the record be complete.

Dr. Melius mentioned a 21-day clock that would start. I would put on the record for you that

I think the deliberations of this Board are terribly important, as in -- captured in the transcript, and we should have the transcript within a minimum of 14 days -- a maximum of 14 days after the end of these deliberations; therefore, that's not inconsistent with Dr. Melius's motion. I think the Chair has to consider his own -- his own time frames between the 14 days and the 21 days.

The other thing I would mention, and Dr. Anderson mentioned this issue of sufficient accuracy. Again I would point out to you from 83.13(c)(i), radiation doses can be estimated with sufficient accuracy if NIOSH has established that it has access to sufficient information to estimate the maximum radiation dose for every type of cancer which radiation doses are constructed, and that could have been incurred in the plausible circumstances by any member of the class -- and it goes on. You need to be aware of that as you -- as you do your motion.

Again, I present all that without bias.

DR. ZIEMER: That's correct, and one of the constraints is that we do have to provide the

transcripts, so we put the pressure on our transcriber to get those available. Of course the Chair would -- would rather have a caveat that allowed the 21 days to be extended in the case that the Chair is off fishing somewhere, but -- but I won't insist on such a modification, so we'll try to meet the 21 days.

DR. MELIUS: We'll get you a satellite modem or something.

DR. ZIEMER: Yes, Mark.

MR. GRIFFON: I would -- I would just ask for the opportunity to deliberate a little bit after lunch, especially on number two. I think we need to -- I --

DR. ZIEMER: Oh, yes --

MR. GRIFFON: -- think we need to --

DR. ZIEMER: -- of course.

MR. GRIFFON: -- go through some of those --

DR. ZIEMER: We'll have the --

MR. GRIFFON: -- prior to a vote. You said come back and vote --

DR. ZIEMER: Oh, yes.

MR. GRIFFON: -- I just --

DR. ZIEMER: No, no --

MR. GRIFFON: -- think we need to --

DR. ZIEMER: Well, the point was, we will --
MR. GRIFFON: -- explore those a little more. Right?
DR. ZIEMER: -- we will defer the vote until after lunch and have an opportunity to see the written motion, and any further discussion will be in order. So we will recess for lunch and then try to reconvene as close to 1:00 o'clock as feasible.
(Whereupon, a recess was taken from 12:00 p.m. to 1:15 p.m.)
DR. ZIEMER: We're going to resume our deliberations now if you'd please take your seats. Board members, Henry Anderson is not with us for a while. He has -- something has come up and he will rejoin us about 2:00 o'clock, but I think we will need to proceed. We -- we now have available to you the written motion that is on the floor. I'd like to make sure all Board members have a copy of the written motion, and this motion remains open for discussions or questions or comments. I -- I was -- okay, Wanda, please proceed.
MS. MUNN: First, thanks to Dr. Melius for being on top of this and having this ready for

us. Thank you, Jim.

A couple of items for consideration. In the second paragraph where we so carefully call out the specific employees that are of concern, I nevertheless have some reservation. This plant on this site had many more workers who were not radiation workers than workers which were radiation workers. That makes it somewhat different than many other sites that we have seen and will be seeing. Despite this very clear definition of who the employees are, it seems to me that it would be worthwhile -- to make the record very clear -- to include a sentence that notes that only a fraction of the total employees at this site are covered by the designation here.

DR. ZIEMER: Thank you for the comment. Let me point out that the words here correspond to the description in the petition from the petitioners, so I -- I guess I'm wondering if it's necessary to go beyond what was being petitioned and trying to define that any further. I'm -- I understand your point. Is it necessary that we do that is what I'm asking.

DR. MELIUS: Can I just --
DR. ZIEMER: Could you --
DR. MELIUS: -- address that, 'cause I understand it, also, and with the -- the finish of that sentence, the second -- second phrase in it was (reading) and the representativeness of these data has not been established -- was when I was trying to capture that point. I mean it's -- trying to keep it relatively brief and accurate, and I think that captures what you're trying to address, also.
MS. MUNN: No -- no, it really doesn't.
DR. MELIUS: No? Okay, I --
MS. MUNN: It really doesn't, because I want to make very clear to any individual reading this document 20 years from now that the individuals for whom this SEC applies are limited not only as described here, but by reason of the fact that they were employees of one certain segment of this site, not all of the site.
DR. MELIUS: Okay, I -- okay.
MS. MUNN: I think that would be -- might not be absolutely necessary, but certainly in terms of clarification for individuals unfamiliar with our process or with this site, it would be

helpful in my opinion, and shouldn't be too difficult to add.

DR. ZIEMER: I think you're certainly welcome to offer an amendment to that effect, or maybe you want to give that some thought and --

MS. MUNN: I'll -- I'll compose a sentence to that effect.

DR. ZIEMER: -- compose something, and we can come back to that. Did you have an additional comment?

MS. MUNN: Yes. Yes, I did. Second bullet, these are just editorial nits, hopefully clarifying ones. In the second sentence of the second bullet, (reading) even when a personal monitoring program was implemented -- I would suggest striking "most" and say "many of the nuclear area workers were never monitored," again reinforcing that we're talking specifically to radiation workers and no others. Semicolon, "consequently, the representativeness of these data cannot be clearly established." I don't think that changes your meaning any, does it, Dr. Melius?

DR. ZIEMER: Let me ask the mover and seconder if they consider that a friendly amendment or

do you wish to formalize it?

DR. MELIUS: Well, I believe that in what we've heard presented, I think "most" is accurate, and so I would say -- I would be acceptable to somebody saying "most of the nuclear area workers were never monitored," period, "Consequently, ..."

MS. MUNN: Fine with me.

DR. MELIUS: Is that...

DR. ZIEMER: Okay, and that's okay --

DR. MELIUS: I'm willing to accept that as a --

DR. ZIEMER: So with the consent of the mover and the seconder, a friendly amendment that would say -- or add the words in the second bullet, second sentence, "Even when a personal monitoring program was implemented, most of the nuclear --

DR. MELIUS: Area --

MS. MUNN: "Nuclear area workers were never monitored," semicolon, "consequently the representativeness of these data can-- cannot be clearly established."

DR. ZIEMER: "Consequently" rather than "and."

MS. MUNN: Correct.

DR. ZIEMER: "Consequently the

representativeness of these data has not been established."

MS. MUNN: I would prefer "cannot be clearly established." Because efforts have been made to cause them to be representative.

DR. ZIEMER: "Cannot be"?

DR. DEHART: I don't know that -- I don't know that that is -- is reasonable. Ten years from now it might have -- it might be.

DR. ZIEMER: It implies a future tense kind of thing, you're saying.

DR. DEHART: Yes.

DR. ZIEMER: It has not been. Whether it can be in the future is perhaps --

MS. MUNN: Then "cannot be clearly established at this time."

DR. ZIEMER: Cannot -- is that agreeable, friendly amendment?

DR. MELIUS: I think it says the same thing.

DR. ZIEMER: Cannot -- cannot clearly -- cannot -- say it again, Wanda.

MS. MUNN: Cannot be clearly established at this time.

DR. ZIEMER: Okay.

MS. MUNN: And the last sentence of that same

bullet, we had referred in the earlier sentence to uncertainties, and it seems logical to me that we would call those uncertainties by that same term in that last sentence, rather than limitations and deficiencies. These uncertainties cause a number of difficulties for performing...

DR. ZIEMER: But -- mover and seconder, do you --

DR. MELIUS: That's fine with me.

DR. ZIEMER: That's --

DR. DEHART: Yes.

DR. ZIEMER: -- fine with you. So these uncertainties --

MS. MUNN: Uh-huh.

DR. ZIEMER: -- cause a number of difficulties --

DR. MELIUS: These limitations -- I would prefer that limitations be maintained in there.

DR. ZIEMER: Limitations and --

MS. MUNN: Limitations and uncertainties, uh-huh.

DR. ZIEMER: Agreed?

MS. MUNN: Uh-huh.

DR. ZIEMER: By the mover and seconder? Thank

you. Further --

MS. MUNN: I have one -- one last word. The last line of the third bullet. It currently reads that (reading) At our February meeting NIOSH concluded it is likely that radiation doses at the AOP (sic) during the time period could have endangered the health of members of this class.

We determined that it could have endangered the health of some members of this class. I do not believe we can say that all members of this class were endangered. I recommend the addition of the word "some" before "members."

DR. ZIEMER: The "could have" probably has the same effect, I would judge. In keeping with the requirement of the regulation, the finding has to be that it could have endangered members of this class. I think we're trying to stay with the wording of --

MS. MUNN: With the wording of the --

DR. ZIEMER: -- the requirement, so --

MS. MUNN: -- proper language.

DR. ZIEMER: -- if you're --

MS. MUNN: Fine.

DR. ZIEMER: Without objection, we'll leave

that one --

MS. MUNN: That's my only comments.

DR. ZIEMER: Thank you. Mark Griffon.

DR. MELIUS: Can I just add one --

DR. ZIEMER: Jim.

DR. MELIUS: -- hunk of that was from the last letter, that phrasing, so just --

DR. ZIEMER: Word for word, yes.

DR. MELIUS: Yeah.

DR. ZIEMER: So it was the action at the last --

MS. MUNN: Yes.

DR. ZIEMER: Thank you. Mark.

MR. GRIFFON: You can go on to someone else. I was --

DR. ZIEMER: Okay. Robert Presley.

MR. PRESLEY: This is Bob Presley. I agree with Wanda. There needs to be something put in the second paragraph to distinguish nuclear workers and the explosive workers in parts of the plant.

DR. ZIEMER: Do you feel that the addition of the word "nuclear area" that was added is in-- is not sufficient to do that, or are you suggesting additional wording?

MS. MUNN: It still doesn't quite put...
MR. PRESLEY: Yeah.
DR. ZIEMER: Right now the second sentence says (reading) Even when a personnel monitoring program was implemented, most of the nuclear area workers were never monitored; consequently the representativeness of these data cannot be -- cannot --
DR. DEHART: Has not been...
MS. MUNN: Be clearly --
DR. MELIUS: Be clearly established at this time.
DR. ZIEMER: -- be clearly established at this time.
MS. MUNN: Yeah, that -- I think that's not the -- the lack of clarification. The lack of clarification to which I referred originally was in the second paragraph, not the second bullet.
MR. PRESLEY: Right.
MS. MUNN: I was requesting the addition of --
DR. ZIEMER: Oh --
MS. MUNN: -- another sentence --
DR. ZIEMER: -- up in the --
MS. MUNN: -- in the second paragraph.

DR. ZIEMER: -- class of employees.
MR. PRESLEY: This is Bob Presley again.
DR. ZIEMER: Yes. Actually Wanda had volunteered I think to get us some words here in a few minutes that would be inserted, so you're -- you're agreeing with that.
MR. PRESLEY: Yes, yes.
DR. ZIEMER: And at that point we'll determine whether that's a motion to amend or whether or not that's a -- a friendly amendment. Is there some clarification that could be added here, Dr. Fuortes?
DR. FUORTES: A minor clarification, or -- or I'm not sure that this needs clarification because maybe you already understand this, but this facility had a huge, huge population of -- of high explosives-only work force --
MS. MUNN: Yes.
DR. FUORTES: -- and those we have excluded from the population. There is a smaller -- so it's a -- there's probably 36,000 workers who ever worked at the facility, of whom we assume about 3,400 were Line 1 or AEC workers, so we've already excluded the DOD work force. Within Line 1, however -- just to consider this

-- the language that you're using is something that would be very, very difficult for us to -- us and the Department of Labor and Department of Energy to -- to address because people's -- people went back and forth between the bays and the high explosives areas, and we don't actually have a track record -- all we have is the -- is the fact that they were eligible to be in that work area, but not a track record of what site they worked in over periods of time. So we -- we can discriminate -- 90 percent of the work force were only high explosives workers, but of that ten percent, that 3,400 or 3,600, can't tell you for a fact was there a worker who only worked in high explosives during their -- their work history there.

DR. MELIUS: Can I speak to that --

DR. ZIEMER: Thank you. Jim?

DR. MELIUS: -- Paul? It was my recollection and understanding from the last meeting that the way we have this paragraph worded saying that the atomic weapons -- the DOE or Atomic Weapons Employer employees was designed to capture that -- that issue, and then it's really up to the Department of Labor, I

believe, to make a determination for an individual employee whether they fall into that. And I think we need to be careful about trying to further clarify that in a way that's going to sort of interfere with the legalities of making a determination of -- of whether or not somebody's eligible or not. I don't think we should try to further restrict it. I think the restriction and clarification is based on the -- what's -- what's in that paragraph.

DR. ZIEMER: I don't think Wanda was trying to restrict it so much as to point out that it really represents only a small fraction of the total work group, but maybe that's not our job to really do that.

DR. MELIUS: I should say inadvertently restricted, I think that's the --

DR. ZIEMER: Yes, Liz, please.

MS. HOMOKI-TITUS: Where you use the word "or Atomic Weapons Employer," that has a very specific definition, and this is a DOE site, it's not an AWE site, so you may want to use some different language to describe what you're trying to say there, or indicate that you're not using the definition that that's given in

the statute, 'cause AWEs are contractor sites and this is a DOE site, I believe.

DR. MELIUS: Well, my recollection is you provided this language to us last time, or we lifted it from some -- someplace. I don't -- I'm not disagreeing with you, but...

DR. ZIEMER: It's certainly true that AWE is a very specific designation. This was not an AWE site, and the -- I want to make sure that we align with the petition itself.

(Pause)

Is it -- is it correct that if we use the word "all Department of Energy contractor or subcontractor employees" it would fully cover this cohort? Dr. Fuortes is indicating he believes that to be the case.

DR. DEHART: As is Mr. Elliott.

DR. ZIEMER: Mr. Elliott is indicating -- so without objection then we would strike out the words "Atomic Energy (sic) employees" since it probably does not apply -- or the -- we'd strike out the phrase "or Atomic Weapons employee." Thank you for that clarification. Let's see, Gen Roessler is next.

DR. ROESSLER: To fine tune a little bit, in

the second bullet, line seven where we're talking about the serious uncertainties, talking about radon, I think it should say "evaluation of radon levels" or "evaluation of radon progeny exposures." We might need --

DR. MELIUS: Yeah, that's...

DR. ROESSLER: I might need some help on -- on whether that's proper. Dr. Field could probably advise us as to what the proper terminology is there.

DR. ZIEMER: Dr. Field?

DR. ROESSLER: Without an S.

DR. ZIEMER: I thought I said Dr. Field.

DR. ROESSLER: You did.

DR. ZIEMER: I didn't this morning. I was corrected.

DR. FIELD: Yeah, I think if you just say "radon and progeny," I think that would say --

DR. ZIEMER: Will cover it?

DR. FIELD: 'Cause you're measuring the radon gas. That's what's always been measured so far, not the progeny, but the progeny's actually what causes lung cancer. So if you just say "radon and associated progeny."

DR. ZIEMER: Well, generically we -- the term

that we have here now is "radon exposures" --
DR. FIELD: Well, I think you can just say radon and radon progeny.
DR. ZIEMER: Without the word "exposures"?
DR. FIELD: That would cover it, I think.
DR. ROESSLER: Levels or --
DR. FIELD: Concentrations.
DR. ROESSLER: Concentrations?
MR. PRESLEY: Radon concentrations.
DR. ZIEMER: The suggestion is to use the words "radon and radon progeny -- levels"?
DR. FIELD: Concentrations.
DR. ZIEMER: Concentrations. Is that agreeable with the mover -- that's considered friendly?
DR. MELIUS: Uh-huh.
DR. ZIEMER: Okay. Any more friendly or unfriendly amendments?
MR. GRIFFON: Yeah, I --
DR. ZIEMER: Mark.
MR. GRIFFON: Just -- in the -- in the second bullet there, I think we -- we ought to note -- in the first line, limited monitoring data available at the facility, and I -- I'd suggest maybe to amend that by saying either external or internal dose -- dose data, something to

that effect. I think we need to point out the -- we've been focusing our discussions on the external dosimetry, but earlier on we noted that there was very limited bioassay information throughout the -- the site history for throughout this time period. So I think that can be --

DR. ZIEMER: So you're suggesting the addition of the words "external -- external or internal"?

MR. GRIFFON: Yeah, external or internal dose data -- I'm trying to be --

DR. ZIEMER: That's probably --

MR. GRIFFON: -- brief.

DR. ZIEMER: -- that's probably friendly, but let me ask this question. The word "monitoring" itself can be even more inclusive than personnel monitoring. It can also include area monitoring. So as I read this term now, it actually is a broader term than if we added the words "external and internal," which then restricts it to personnel monitoring. We could say "external, internal or area monitoring."

MR. GRIFFON: I mean external or internal did not imply personal external or internal, you

know. I -- I guess I just wanted to make sure we didn't miss the -- the -- we -- maybe we can include it in another line, but I think it's important that we point out both the limitations of the external data -- external dose-related data and data related to doing internal dose calculations.

DR. ZIEMER: Well, are you suggesting we add the words "external and internal" at that point then, and does that not imply personnel monitoring, Mark? I mean external and internal personnel monitoring is what that becomes, does it not? Or not?

MR. GRIFFON: Maybe -- maybe we could say "used for determining external or internal doses," you know, parenthetically. Limited monitoring data available at this facility, parentheses, used for determining -- or used for calculating -- or estimating external/internal doses.

DR. DEHART: The second sentence refers to personnel monitoring. Look at that, does that take care of it?

DR. ZIEMER: Well, I don't think this changes the intent. Can we just agree -- let's add a parenthetical phrase after "available at this

facility," paren, "used for external or internal dose determinations."

DR. MELIUS: Yeah.

DR. ZIEMER: Does that --

MR. GRIFFON: Yeah.

(Pause)

DR. ZIEMER: Okay. Wanda, did you have any additional -- oh, I'm sorry. Yes, Mr. Anderson.

MR. ANDERSON: Could I ask that we zoom in on the screen so some of us with bad eyes can see that at the back of the room?

DR. ZIEMER: Yes.

MR. ANDERSON: Just go to 150 percent or something.

(Pause)

DR. ZIEMER: Or in between, is that -- is that okay?

MR. ANDERSON: Excellent.

DR. WADE: Liz.

DR. ZIEMER: Liz, did you have a clarification for us there?

MS. HOMOKI-TITUS: I have a question for you all, just to make sure that we cover what you want. Back to the people that you're

recommending covering, right now you have -- so all Department of Energy contractor and subcontractor employees, and I believe if you look at page 20 of Larry's presentation, they recommend a definition that you may want to consider using, because it's all employees working at Iowa Ammunition Plant Line 1, which includes the statements -- and right now you only are specifically covering contractors and subcontractors. You're not covering Department of Energy employees. I don't know if you -- if that's what you intended, that's fine, but I just wanted to make sure we got exactly what you guys were trying to cover.

DR. ZIEMER: The intent is not to exclude Department of Energy employees, so a simple solution would be to cover all Department of Energy employees and their contractors and subcontractors. Or perhaps we can use just the wording here. Larry?

MR. ELLIOTT: I would just, for clarification -- we're back in the day of the AEC, and I believe the statute defines the AEC as a predecessor to DOE, so there were A-- in my understanding, there were AEC inspectors that

came into this facility, and we just want to make sure that the Board includes them.

DR. ZIEMER: Right. But we don't need to use the word "AEC" here, I guess, do we? You're using the word "DOE" in your document, the legit--

MS. HOMOKI-TITUS: I believe that the statutes says DOE and its predecessors, which AEC --

DR. ZIEMER: Right.

MS. HOMOKI-TITUS: -- is one of them, so if you refer to DOE employees, then you're -- you should be covering that whole (unintelligible).

DR. ZIEMER: So isn't a simple solution be just to put Department of Energy and its contractor and subcontractor, just add the words "and its"?

DR. MELIUS: Yeah.

DR. ZIEMER: Okay, let's do that. Thank you. Thank you, Liz. Jim?

DR. MELIUS: I'm actually not offering any friendly amendments, but -- so -- but the point I wanted to clarify and it's the point that Henry brought up earlier when we talked about the basis for the determination and -- in our discussion here and the regulation which we've

heard Larry and I think Lew refer to -- refers to radiation doses can be estimated with sufficient accuracy if NIOSH has established -- et cetera -- a maximum radiation dose for every type of cancer for which radiation doses are reconstructed that could -- could have -- incurred in plausible circumstances by any member of the class. Then it goes on to say that NIOSH can also develop more precise ways of doing the dose reconstruction. And my understanding from what Henry was saying this morning was -- point that -- sort of a broad line. We're trying to determine where that -- that line is and I think we in fact have determined that they cannot meet this -- this requirement, in essence, due to the reasons that we've laid out here in this -- in our communication to the Secretary. And I just wanted to clarify that and make sure that's what Henry was -- was -- that -- was trying to address.

DR. ZIEMER: I want to go back to Wanda and Bob's suggestion that there be additional clarification on the work force. Wanda, had you --

MS. MUNN: Oh, I'm still wordsmithing. I haven't gotten past the first clause yet.

DR. ZIEMER: Okay. Any other comments or modifications anyone wishes to make?

A question Rich Espinosa -- here, Rich.

MR. ESPINOSA: With the words added, nuclear area workers, I just want to make sure that this isn't going to narrow the scope for the people that have worked in there with maintenance and custodian (sic) and things like that, where they weren't going to be working directly with the pits, but maybe involved directly with the area.

DR. ZIEMER: Let me begin by simply observing that that particular bullet doesn't really define the worker group so much as it just points out that most of the nuclear area workers weren't monitored, sort of a generic statement, but it doesn't -- I don't believe it restricts or defines the group. Ask again the mover if they agree that that is correct.

DR. MELIUS: Yeah.

DR. ZIEMER: Okay. Thank you. Did you have an additional comment?

DR. MELIUS: Well, it's a possible suggestion.

In what's the second paragraph there, the first sentence, Advisory Board and the -- (reading) Advisory Board on Radiation and Worker Health has evaluated SEC Petition 0006 concerning the -- you want to say the nuclear weapons production workers or nuclear weapons workers at the Iowa... I think that -- does that capture what you're trying to clarify, so we specify that this -- we're concerned with just the workers that were involved in nuclear weapons production at this facility, which is really what the petition's about. This is really who's eligible and I think it --

MS. MUNN: Yes, although that may not incorporate exactly the kind of thing that Richard was just trying to -- to capture, and -- and for that reason -- that's one of the reasons why I'm struggling with my language here. I want to try to fulfill that requirement at the same time that we make it very clear that this doesn't cover everyone who ever worked on that site.

DR. MELIUS: Well, my reading of this would be that the second sentence there, the Board respect-- respectfully recommends a Special

Exposure Cohort, and then we define that -- that cohort, is the one that's relevant for determining eligibility. And so the first -- first sentence is just a description of what we're doing. We reviewed a petition. We're just sort of specifying who it -- who it concerned in a general way, not in a way of -- that sort of defines eligibility.

DR. ZIEMER: We want to be careful that we do not redefine this cohort in ways that are different from the petition.

DR. MELIUS: Yeah.

MS. MUNN: Right, but the only thing that I'm suggesting that we do, and the only addition that I'm trying to make, is just a clarification to the uninformed reader that this cohort constitutes a small portion of the total number of employees who worked at this site during that period of time. That's all I'm suggesting.

MR. PRESLEY: Can I offer some wording, please?

DR. ZIEMER: Yes.

MR. PRESLEY: Employees who worked in the manufacturing, assembly or disassembly areas at the Iowa Army Ammunitions Plant Line 1, and

that should take care of all the people that worked in the manufacturing, assembly or disassembly of the nuclear weapons.

DR. ZIEMER: That appears to me, Robert, to be an alternate definition of what is here, rather than what was -- Wanda's trying to describe the others, I believe. Is that correct, Wanda?

MS. MUNN: Yes.

DR. ZIEMER: You -- you're describing the cohort itself in somewhat different words. Right, Robert? Yeah.

MR. PRESLEY: That -- that ties it down.

DR. ZIEMER: Right.

MR. PRESLEY: Yeah, that -- that would tie it down.

DR. ZIEMER: Again I'm -- I'm a little reluctant to describe this cohort in words that are different from the petition. And I don't believe it addresses Wanda's concern here. Let me entertain a comment here while Wanda is -- Larry, as well.

MR. ELLIOTT: I think you should consider using the definition that NIOSH has provided you.

DR. ZIEMER: Right, which is what we have here.

MR. ELLIOTT: Not the petition definition,

because --

DR. ZIEMER: Oh --

MR. ELLIOTT: -- there was some difference in the early -- the initial petition definition, if that's what you're using. I think that's where the AWE came -- I don't know, but we would just suggest that you use the petition definition that we've established and defined.

MR. GRIFFON: And your -- Larry, your definition includes all of what --

MR. ELLIOTT: All DOE workers, all DOE subcontractors, all workers -- the only group that's --

DR. ZIEMER: Was that in your slides? Maybe --

MR. ELLIOTT: Yes, it was in the slides.

DR. MELIUS: Yeah.

MR. ELLIOTT: It was at the -- second to the end, that slide, next to the last slide. The only group that's not in that would be the radiographers.

MR. GRIFFON: Right.

MR. ELLIOTT: And you can talk about that, as well, if you wish, but...

DR. ZIEMER: Can we agree then to use -- if there's a difference, we'll use what's in that

definition. It's -- yes, it's all employees working at the Iowa Army Ammunition Plant Line 1, which includes Yard C, Yard G, Yard L, Firing Site Area, Burning Field B, storage sites and -- for pits and weapons, including Buildings 73, 77 -- from March '49 to 1974. That would be pre-- well --

DR. MELIUS: Yeah, the only difference is small B and a big B under burning field in what we have listed there, I believe.

DR. ZIEMER: Right.

DR. MELIUS: And then I -- if I recall now --

DR. ZIEMER: And we have to still say Department of Energy and its contractors and subcontractors.

DR. MELIUS: Yeah.

DR. ZIEMER: Right.

DR. MELIUS: I think we're...

DR. ZIEMER: So we're okay there.

DR. MELIUS: Yeah.

DR. ZIEMER: Big B, huh?

DR. MELIUS: I believe the Atomic Weapons Employ-- I think we actually used some of your slides from the last meeting, Larry, the one where you laid out what was in the regulations

as to who was potentially eligible and so I think we just sort of threw in AWE as being sort of generally eligible and included it there and that's where that confusion comes from.

DR. ZIEMER: Okay. Clarification point, gentlemen.

UNIDENTIFIED: Sir, at that plant they were -- they were known as A and Division B. If you were Division A, you were exclusively Army. If you were Division B, you were Atomic Energy Commission only.

DR. ZIEMER: Yes, understood.

UNIDENTIFIED: So if you could use -- maybe in a parenthesis or something -- Division B, that would incur (sic) everybody that worked Division B.

DR. ZIEMER: Yes, understood. Nonetheless, I think we need to parallel the way the group has been defined by NIOSH so there's no question on that. Mr. Anderson.

MR. ANDERSON: I was just wanting to clarify that my people, the guards, were included in that since it doesn't specifically say that, but I wanted to get your impression that it

does or doesn't.

DR. ZIEMER: Thank you. Wanda?

MR. ELLIOTT: Could I answer that for Mr. Anderson? Yes, it would include the guards, the security personnel --

MR. ANDERSON: All right.

MR. ELLIOTT: -- and all associated workers who worked in Division B.

MS. MUNN: Yeah.

DR. ZIEMER: Wanda?

MS. MUNN: The SEC petition includes production personnel, physical security personnel, you know -- that's in the SEC.

A suggestion for the proposed addition, single sentence following the description of the employees, ending with SEC, in the second paragraph.

"This cohort encompasses only a small percentage of the total number of individuals employed at this site over the period stated."

DR. ZIEMER: This cohort encompasses only a small --

MS. MUNN: Only a small percentage of the total number of individuals employed at this site over the period stated.

DR. ZIEMER: Over the period what?
MS. MUNN: Stated.
DR. ZIEMER: Stated?
MS. MUNN: Uh-huh.
DR. ZIEMER: Now this sentence does not change the intent of the motion. It is presented to us as a sort of clarification, but -- Larry?
MR. ELLIOTT: I would just offer this for your consideration. I would avoid using "cohort" in that sentence and use "class", because there's a huge confusion that there's multiple cohorts. There's one cohort, and what we're working through is to add classes to that cohort.
MS. MUNN: No disagreement.
DR. ZIEMER: Let me get the sense of the group on adding Wanda's sentence.
DR. MELIUS: Can someone repeat it to me then?
DR. ZIEMER: The sentence is "This class encompasses only a small percent of the total number of individuals employed at this site over the period stated."
UNIDENTIFIED: (Off microphone) (Unintelligible)
DR. ZIEMER: And that is recommended I believe to be added after the -- at -- toward the end

of the second paragraph, after the SEC. Yes, Mr. Anderson?

MR. ANDERSON: Another point of clarification. When you say "at this site," what are we really talking about here? Because --

DR. ZIEMER: Yes --

MR. ANDERSON: -- we had an AEC facility within the physical boundaries of an Army facility, so when you say "at this site" -- when you mention IAAP, that includes 20,000 acres. If we mention AEC, then those 4,000 people -- I think we need to -- some (unintelligible) identify that.

DR. ZIEMER: I don't know the answer to that, myself.

MR. HALLMARK: I feel compelled -- Shelby Hallmark, Department of Labor. I'd like to just suggest that the sentence that Wanda's suggesting might be confusing -- at least it is to me -- because from our perspective at Labor, we -- I believe -- see the proposal, the petition group here, as encompassing all covered employees for the facility -- any -- any individual whom we would consider to be a covered employee under EEOICPA. So while it is

a small percentage of everybody who was on the entire IAAP facility, it's 100 percent -- I think -- of the covered employees under EEOICPA, so --

MS. MUNN: Yes, that's correct.

MR. HALLMARK: -- I just wanted to, you know, make that statement.

DR. ZIEMER: I think you're suggesting it may muddy the water a little bit in terms of clarity. Yes, Leon?

MR. OWENS: Dr. Ziemer, in all due respect, I ask that we move the question.

DR. ZIEMER: Okay. The question's been called for. However, rather than vote to end debate, for a moment let me -- I want to get a sense of this last item. Does the Board wish to include it or not to include it?

DR. MELIUS: I think it's problematic. I understand the intent of what Wanda's trying to do, but I -- I have some concerns about accepting that particular sentence.

DR. ZIEMER: Just for clarity of decision-making, I'm going to consider Wanda's sentence as a motion to amend and ask if there's a second.

(No responses)

There does not appear to be a second, so the motion dies for lack of a second, although I should add that I think everybody understands and agrees with the intent, but there is some concern that it might muddy the water.

The motion as amended in very friendly ways has now been called for. Are you ready to vote on the motion?

MR. ESPINOSA: (Off microphone) (Unintelligible) ask that the motion be read in its entirety (unintelligible).

DR. ZIEMER: It's been requested that the motion be read in its entirety.

DR. MELIUS: I can do it from my notes, if --

DR. ZIEMER: Okay.

DR. MELIUS: -- that would be --

DR. ZIEMER: Dr. Melius will read the motion now in its entirety, as amended.

DR. MELIUS: (Reading) The Board recommends that the following letter be transmitted to the Secretary of DHHS within 21 days. Should the Chair become aware of any issue that in his judgment would preclude the transmittal of this letter within that time period, the Board

requests that he promptly inform the Board of the delay and the reasons for this delay, and that he immediately work with NIOSH to schedule an emergency meeting of the Board to discuss this issue.

I'm reading the letter. (Reading) The Advisory Board on Radiation and Worker Health, parentheses, the Board, close parentheses, has evaluated SEC Petition 0006 concerning the Iowa Ordnance Plant, parentheses, IOP, close parentheses, under the statutory requirements established by EEOICPA and incorporated in 42 CFR 83.13(c)(1) and 42 CFR Section 83.13(c)(3). The Board respectfully recommends a Special Exposure Cohort be accorded to all Department of Energy employees and its contractor or subcontractor employees who worked at the Iowa Army Ammunition Plant Line 1, parentheses, which includes Yard C, Yard G, Yard L, Firing Site Area, Burning Field B, and storage sites for pits and weapons, including Buildings 73 and 77, close parentheses, from March 1949 to 1974 and whom were employed for a number of work days aggregating at least 250 work days, occurring either solely under this employment

or in combination with work days of employment occurring within the parameters, parentheses, excluding aggregate work day requirements, close parentheses, established for other classes of employees included in the SEC. This recommendation is based on three specific factors.

One, all employees identified in the petition worked in one of the earliest environments where nuclear materials were handled.

Two, there are limited monitoring data available at this facility, parentheses, used for external or internal dose determinations, close parentheses, during the time period involved. Even when a personal monitoring program was implemented, many of the nuclear area workers were never monitored; consequently, the representativeness of these data cannot be clearly established at this time. In addition, personal exposures in some job categories with significant radiation exposures were never monitored. There are also serious uncertainties regarding the monitoring techniques in place at that time, with the evaluation of radon and radon progeny

concentrations at the facility, with the basis for calculating the neutron to photon ratio, and with the evaluation of exposures from some sources of exposures, for example, the pits. These limitations and uncertainties cause a number of difficulties for performing individual dose reconstructions.

Number three, at our February meeting NIOSH concluded that it is likely that radiation doses at the Iowa Ordnance Plant during this time period could have endangered the health of members of this class. The Board concurs.

Based on these considerations and our discussions and deliberations at our February and April Board meetings, the Board recommends that this Special Exposure Cohort petition be granted.

In addition, the NIOSH evaluation of the petition defines a class of employees who worked from June 1947 to May 1948 prior to the introduction of any radioactive materials or radiological procedures at Line 1 of the Army Ammunition -- Iowa Army Ammunition Plant. For this class NIOSH determined that no feasibility determination is necessary because members of

the class received no radiation doses, as covered by EEOICPA. The Board concurs with this determination.

Finally, the petition and evaluation also addresses a potential class of employees composed of industrial radiographers who may have conducted radiography on non-radiological high explosive weapons from May 1948 to March 1949. NIOSH plans to issue a separate evaluation -- evaluation report addressing this potential class in the near future. In the context of this petition and evaluation, the Board concurs with this decision.

DR. ZIEMER: Thank you. You have the motion. Are you ready to vote?

Okay, all those who favor the motion, please raise your right hand.

(Affirmative responses)

There appear to be none opposed. Any abstentions?

(No responses)

The motion carries. Lock the doors so these people don't leave. We need -- we -- we have an additional item pertaining to Iowa.

At our -- at our telephone meeting last month

the Board appointed a workgroup to draft a letter of regret, and we have that letter before us. This was drafted by Mike and Richard -- Mike Gibson and Richard Espinosa -- and Board members, you should have a copy of that letter before you now. This comes to us from the working group and therefore constitutes a motion before the Board. It does not require a second. It is now open for discussion.

I should ask if all the Board members had an opportunity to read the letter. I know that it was just distributed earlier today, and I do want to give you opportunity -- yes, Rich, you have a comment?

MR. ESPINOSA: (Off microphone) (Unintelligible) I have it because, you know, me and Mike worked on it, but I don't have it (unintelligible).

DR. ZIEMER: We have a hard copy -- an additional one, we'll get you one here shortly. You'll notice on --

DR. MELIUS: I think I need one, too, Lew.

DR. ZIEMER: You'll notice on page two -- get an extra one for Dr. Melius. On page two,

second paragraph from the end, we need to insert a date. I believe the date to be inserted is the date of our telephone Board meeting.

MR. GIBSON: It was the 24th or the 25th, I just wasn't sure which --

UNIDENTIFIED: April 11th.

DR. ZIEMER: It was the Board meeting in -- by phone in March, full Board meeting...

MR. PRESLEY: April 11th.

DR. ZIEMER: You're right, it was April 11th is the correct date. April 11th should be inserted there.

DR. ANDERSON: You could indicate it was 5:00 a.m. for Wanda.

MS. MUNN: Please.

DR. ZIEMER: Let me ask if any Board members wish to amend in any way this draft? Dr. Roessler?

DR. ROESSLER: Just a question on the terminology. The petition we just approved was for the Iowa Ordnance Plant. This document refers to both the Iowa Ordnance Plant and the IAAP. Is that the --

DR. ZIEMER: There are at least three names, I

think, that get used for this facility.

DR. ROESSLER: We should probably pick one and stick with it.

DR. ZIEMER: Let's pick one and stick to it. Shall we call it Iowa Army Ammunition Plant, IAAP? So if we can modify this throughout to make it consistent, we'll add that. Any others? Yes, Roy Gibs-- Roy DeHart.

DR. DEHART: Turning to page two, this -- the most narrow or shortest paragraph, (reading) The Advisory Board's letter of recommendation...

I would suggest we put in there clearly what the recommendation was for, the purpose -- for the cohort.

DR. ZIEMER: The Advisory Board's letter of recommendation approving -- or recommending approval of a Special Exposure Cohort --

DR. DEHART: Designation.

DR. ZIEMER: -- class -- designation? Any others?

(Pause)

There's a question on the grammar in the middle of the second page, the second sentence. (Reading) We relied on NIOSH staff, it appears,

who had not represented -- is that the question?

DR. WADE: No, we are not aware for the bias (sic) --

DR. ZIEMER: Oh, for the -- We are not aware for the basis -- aware of the basis, of the basis, is that -- and what was the other? Is that -- was that the only issue there, Lew?

DR. WADE: Yes.

DR. ZIEMER: Yes.

DR. DEHART: The last paragraph of the same page, two.

DR. ZIEMER: Yes.

DR. DEHART: I can't recall exactly what was said. Is this a correct statement as -- does anyone recall?

DR. ZIEMER: The last paragraph on page two?

DR. DEHART: Correct. Is that a -- is that a correct statement, (reading) The Board did not task SCA to review the SEC petition --

DR. ZIEMER: That's correct, we tasked them to review the site profile for Iowa. There was no task to review the petition itself. That's correct, is it not, Dr. Wade? Yes.

DR. DEHART: And that was because of

procurement, because there was no procurement vehicle?

DR. WADE: That -- I don't know that.

DR. ZIEMER: Well, the way the sequence of events arose, what we had from NIOSH, the new document was in fact the revised site profile. And so we asked SC&A to assist in the rapid review of that new document on behalf of the Board because that was the issue that -- where we needed some -- some assistance, so I believe this is correct as Mike has stated it. Mike?

MR. GIBSON: But as memory serves me correct, after this data came out a few days later, I believe it was NIOSH that asked our contractor to review the TBD.

DR. ZIEMER: Actually it was Lew Wade who made the request, I believe --

DR. WADE: Correct.

DR. ZIEMER: -- with my concurrence that -- that as soon as I got the document, we talked to Lew and asked that John Mauro be contacted to determine whether or not they could in fact do this. And yes, it's true that -- that Lew is employed by NIOSH -- not by OCAS, but -- but the request came with my concurrence on our

behalf, and his position as our Federal -- Designated Federal Official for this Board, and working within the existing task, yes.

DR. WADE: Right.

DR. ZIEMER: Wanda?

MS. MUNN: In keeping with my nit-picking nature, could I request that you remove the T from that word? There's something about using the word "task" repeatedly as a verb that is disturbing to some of us.

DR. ZIEMER: Did not task SC&A --

MS. MUNN: Could we say the Board did not ask SC&A?

DR. ZIEMER: Ask or request?

MS. MUNN: Yeah, either.

DR. ZIEMER: How about request? Is that agreeable that... Dr. Melius?

DR. MELIUS: Yeah, the first paragraph on the third page, the last sentence of that. I believe that we have undertaken steps (unintelligible) -- and we will undertake steps to assure -- I think we need to refer to our actions at this meeting that we just took. One is that we did approve the Special Exposure Cohort petition and we did take steps to help

assure that -- at least the miscommunication that was associated with this last situation will not recur.

DR. ZIEMER: Basically you're asking to update this to refer --

DR. MELIUS: Yeah.

DR. ZIEMER: What paragraph are you in?

DR. MELIUS: I think it's the first paragraph of the third page, (reading) The Advisory Board recognizes that the actions of NIOSH...

DR. ZIEMER: Michael, do you want to respond to that?

MR. GIBSON: Yeah, I -- I don't guess I have a problem with that. The only reason it was written this way is because at the time the Board voted to -- to generate this letter it appeared that --

DR. ZIEMER: The action hadn't been taken.

MR. GIBSON: No, we have some regrets in what had taken place due to the -- the petitioners at Iowa, so...

DR. MELIUS: And I'm not -- I'm not suggesting that we take back the general intent or purpose of the letter. I just think we should update to say that -- that we have -- at least,

particularly in this paragraph, that we have taken steps, one, to approve the SEC; and secondly to at least try to prevent any miscommunication that -- and uncertainties around that.

DR. ZIEMER: So it would then read "we have tak-- we have undertaken steps to assure that actions are followed up" and so on, is that...

DR. MELIUS: Yeah.

DR. ZIEMER: Is that what you're suggesting?

DR. MELIUS: Yeah.

DR. ZIEMER: And Michael, are you agreeable with that?

MR. GIBSON: Yeah, I just -- I wanted -- in my opinion, I thought we wanted not only Iowa but -- this is to Iowa -- but to know that we wouldn't be caught in this situation --

DR. ZIEMER: In the future --

MR. GIBSON: -- down the road with something else.

DR. ZIEMER: Exactly, right. Any other changes?

I would like to now -- do members of the -- does the general public have copies of this?

DR. WADE: The draft is on the back table, yes.

DR. ZIEMER: The draft is on the back table. I think it would be appropriate if the letter be read. Lew, would you be willing to read this -- conserve my voice?

DR. WADE: If you'd give me your --

DR. ZIEMER: This is the letter from the Board. It's directed to the folks here in Iowa.

DR. WADE: (Reading) This letter from the Advisory Board on Radiation and Worker Health is to express our sincere regret to the claimants and survivors from the Iowa Army Ammunition Plant for an additional delay in processing of their petition for the Special Exposure Cohort status.

During an Advisory Board meeting in St. Louis, Missouri on February 9th, 2005 a petition for exclusion -- for inclusion as a Special Exposure Cohort for a class of former employees of the Iowa Army Ammunition Plant was presented by NIOSH and deliberated by the Advisory Board. Following the deliberations, the Advisory Board on Radiation and Worker Health unanimously passed a motion to forward a letter to the Secretary of Health and Human Services to recommend Special Exposure Cohort status be

granted to the defined class of employees for the Iowa Army Ammunition Plant.

The actions taken by the Advisory Board to that point were consistent with the duty and authority assigned to us as members of the public appointed by the President under Section 3624 of Public Law 106-398.

In its SEC evaluation report presented to the Board NIOSH established that it would have to rely on security-classified information to conduct dose reconstructions for employees at IAAP, and has determined that such data may not provide a viable basis for conducting dose reconstructions. The classified information that NIOSH could not release to the public for the protection of national security includes source term and process information needed to reconstruct radiation doses for employees.

This limitation on the transparency of NIOSH dose reconstructions for IAAP employees would be likely to undermine the credibility of such dose reconstructions among the IAAP claimant population.

The SEC evaluation report which was signed by Larry Elliott stated, quote, NIOSH has

determined this limitation on the transparency of the NIOSH dose reconstruction program, imposed through the use of classified information, may be unacceptable for the purposes of conducting dose reconstructions under EEOICPA. For this reason, NIOSH finds that it is not feasible to estimate doses with sufficient accuracy (sic) for employees working on Line 1 AEC operations at the Iowa Army Ammunitions Plant in Burlington, Iowa during the years of 1949 to 1947, close quote.

The Board, after evaluating the adequacy of the data for purposes of the SEC recommendation, parentheses, but without technical assistance from its audit contractor, close parentheses, and after considering the NIOSH position on transparency, and receiving advice from DOL and the public, voted on the following proposition (sic):

Bullet, there are limited monitoring data available at this facility during the time period involved. These limited data cause a number of difficulties for performing individual dose reconstructions. In addition, a number of serious questions have been raised

about the accuracy and completeness of the monitoring data.

Bullet, NIOSH reports that data critical to performing individual dose reconstructions is classified and not available to the public at this time.

Bullet, following extensive efforts seeking, retrieving and reviewing all available information, NIOSH has concluded that it is likely that radiation doses at the Iowa Ordnance Plant during this time period could have endangered the health of members of this class. The Board concurs.

Given these difficult circumstances and the importance of transparency to the dose reconstruction program, the Board recommends that this Special Exposure Cohort petition be granted.

Approximately seven days after the Board meeting DOE transmitted NIOSH's Revision 1 site profile for IAAP to NIOSH. None of the information contained in that site profile was deemed classified. NIOSH transmitted the revised site profile to the IAAP SEC petitioners several weeks later. Further, the

Board was advised that some of the data which NIOSH represented as classified by the Department of Energy in its Revision 1 site profile was not classified.

We are not aware of the basis for NIOSH concluding that any part of its site profile would be classified. We relied on NIOSH staff, it appears, who had not represented the potential options with respect to transparency issues. We have been advised, however, that no information was declassified by the Department of Energy in the Revision 1 site profile.

The Advisory Board's letter of recommendation recommending approval of the SEC petition was not sent to the Secretary as the Board assumed would happen.

The Advisory Board ratified a decision by NIOSH to seek assistance from Sanford Cohen & Associates, the Board audit contractor, to review the Iowa site profile on April 11th, 2005. Sanford Cohen & Associates has had a short period of time to review the site profile, and portions of its report indicate the need to conduct further evaluations or to await declassification of notes. SC&A staff

was also delayed in its work by the absence of Q clearances. We recognize DOE for working to expedite these Q clearances once NIOSH provided the necessary information to DOE.

The Board did not request SC&A to review the SEC petition or evaluation report, or its supplement, because there was no procurement vehicle in place to secure such review due to objections from the NIOSH Office of Compensation and Analysis Support.

The Advisory Board recognizes that the actions of NIOSH were not consistent with the actions taken during the St. Louis, Missouri meeting on February 9th, 2005. Further, the Advisory Board has discussed this inconsistency and we have undertaken steps to assure that its actions are followed up with transmittals to the Secretary of HHS or convene emergency meetings if new information arises which would conflict with its previous recommendations.

In closing, the Advisory Board on Radiation and Worker Health expresses our regrets to the petitioners, claimants and survivors of the Iowa Army Ammunition Plant.

DR. ZIEMER: Thank you, Lew. There -- I do

note, as I heard it read, the issue of NIOSH tasking SC&A -- that technically that was the Chair and the Designated Federal Official. That would have -- I'm looking to see where that is. I think that probably needs to be corrected here.

DR. DEHART: Bottom of two. Bottom of two.

DR. ZIEMER: Bottom of two.

DR. WADE: The Advisory Board ratified a decision by NIOSH.

DR. ZIEMER: Yeah, the decision was -- NIOSH did not make that decision, in a -- is that correct? I mean it was --

DR. WADE: That's correct, I made that decision.

DR. ZIEMER: -- the two of us that made the decision, so I think --

DR. MELIUS: Just clarify that, probably.

DR. ZIEMER: I'm just looking to see where it is in this motion.

DR. WADE: It's the second page --

DR. MELIUS: First sentence -- yeah.

DR. WADE: -- the next to last paragraph, the Advisory Board ratified the decision by NIOSH --

DR. ZIEMER: I see it now, yes -- decision by the Board's Chair and its Designated Federal Official, is what should be said there.

MR. GIBSON: Paul?

DR. ZIEMER: Yes, Michael?

MR. GIBSON: I don't mind -- I don't mind if the record's clear, but I think the point that -- at least I thought we were trying to get across is that we won't get caught in the -- in the short hairs next time, that we'll -- that there'll be a system in place that --

DR. ZIEMER: Right.

MR. GIBSON: -- we'll convene an emergency meeting if we have to to --

DR. ZIEMER: Right, and this was taken care of by some specific words in the current motion that we have already approved, and I think we have on our agenda for tomorrow a more permanent solution to how we will proceed on these documents so that we don't get caught in that again.

Okay, let me ask, Board members, now any other items on this? You've heard the full letter now, motion that's before us. Any other comments before we vote?

(No responses)

I do want to ask this question. Again, I saw the letter for the first time just a moment ago. At the very end of page two it said that there was no procurement vehicle in place due to objections from OCAS -- NIOSH/OCAS. Is -- I just want to make sure that that is correct. I'm not aware that they had prevented us from putting anything in place. Lew or Larry --

DR. MELIUS: Well, let me address that because I can distinctly remember a meeting where I made that suggestion and Mr. Elliott strongly objected to the development of any procurement task order that was related to that particular item. And whether prevention is the right word, I'm not sure, but it certainly -- there was certainly strong NIOSH objection to it at -- at the time.

DR. ZIEMER: At that time?

DR. MELIUS: Yeah.

DR. ZIEMER: Okay. I just wanted to be sure that that was indeed factual, because as a matter of fact, we are looking at putting such a vehicle in place with the help of NIOSH at the moment, though. Okay. Thank you.

Other items? Are you ready to vote then on this?

All in favor of approving this letter now as slightly amended, say aye?

(Affirmative responses)

Any opposed, no? Any --

MR. GRIFFON: I'll abstain.

DR. ZIEMER: -- abstention? One abstention. The motion carries and this letter expresses the regrets of the Board to our constituents in Iowa.

The Chair recognizes Mr. Anderson.

MR. ANDERSON: I appreciate -- as a petitioner I wish to thank the Board for their action and for the letter of apology, and I understand what happened and I really do appreciate the thought and concerns that each one of you have put into this. Thank you.

DR. ZIEMER: Si --

MR. IVERSON: As a former worker, I thank all of you. Thank you very much.

DR. WADE: We have Missouri people waiting, so --

UNIDENTIFIED: I want to thank all of the Board. You're so gracious and you've worked so

hard, and we appreciate this for all the people that -- that are sick and dying.

DR. ZIEMER: Okay. Thank you very much.

UNIDENTIFIED: And I want to thank Larry 'cause he put in his all, too.

DR. ZIEMER: They --

UNIDENTIFIED: He did his job, and we do thank each and every one of you. Thank you very much.

DR. ZIEMER: Thank you very much. We are going to proceed. We have Mallinckrodt folks sort of waiting in the wings to get underway here, so we are going to proceed on our agenda.

DR. WADE: So we can take Tom Horgan reading a letter from Senator Bond, once the room settles.

DR. MELIUS: Can we take a break before we -- at this time?

UNIDENTIFIED: (Off microphone) (Unintelligible) proceed with the opening statements (unintelligible) --

DR. ZIEMER: Yes, we can.

UNIDENTIFIED: (Off microphone) -- and if you want to take a --

DR. ZIEMER: We certainly can.

DR. WADE: That's fine.

DR. ZIEMER: The Chair will recognize Tom Horgan, who will come and give us some remarks from Senator Bond's office.

(Whereupon, the discussion turned to a focus on Mallinckrodt until the public comment period.)

DR. WADE: And then it's going to be --

MR. GRIFFON: Are we taking a break or...

MALLINCKRODT TECHNICAL BASIS DOCUMENT

DR. ZIEMER: We'll have the opening remarks here and then we'll have an opportunity for a break, so let us proceed. Thank you, Tom, for being with us today.

DR. WADE: Please, I would ask that we -- we respect now the beginning of the Mallinckrodt discussion.

DR. ZIEMER: Iowa folks, thank you for being here. If you have sidebar conversations, if you would do that out in the lobby, please, so we can proceed, we thank you very much. Again, welcome, Tom, to the podium.

MR. HORGAN: Members of the Board, my name is Tom Horgan and I'm with U.S. Senator Christopher "Kit" Bond's office of Missouri. Unfortunately Senator Bond cannot be here today

due to votes that are taking place on the floor. There is quite a significant piece of legislation on the floor this week, of which Iowans and Missourians I'm sure are interested, and Senator Bond plays an important role in that bill.

Nevertheless, he wrote a statement to the Board which I would like to read and submit for the record. However, before I begin I would like to briefly mention a few things.

First of all, a lot of the former workers from the Mallinckrodt site, particularly the downtown site, would like to have come up for this meeting, but they could not make the trip because a lot -- as you know, a lot of them are older and not well enough. However, I believe a few have made it up here and they may be filtering in around...

Secondly, I communicated to Senator Bond last night and he was quite surprised to hear about the DOJ opinion on the transparency/confidentiality issue or classified issue that was issued at 5:00 p.m. Friday night. I didn't find out about it until the plane ride on Sunday night. At any rate,

he expressed an interest in learning more about the origins, facts and personnel surrounding that request and opinion.

Finally, I do want to thank the kind people of Cedar Rapids, Iowa and the citizens of Iowa for their warm welcome and their hospitality. You don't get that everywhere you go, so I appreciate it.

Now I would like to read the statement -- Senator Bond's statement to the Advisory Board, to be submitted for the record.

(Reading) Good morning. Thank you once again for taking time out of your busy schedules to attend this meeting to discuss and act upon the extremely important issues related to the Energy Employees Occupational Illness Compensation Program Act of 2000. I greatly appreciate your dedication and expertise in advising NIOSH on the administration of this statute.

At your previous Board meeting in St. Louis members of this Board made a calculated decision to designate the former nuclear energy workers who worked at the downtown Mallinckrodt site from 1942 through 1948 as members of the

Special Exposure Cohort under EEOICPA. This decision was made primarily due to the absence of any employee exposure data upon which a credible dose reconstruction for these former workers could be calculated. I strongly commend the Board for this decision, which has brought long-awaited justice in the form of expedited compensation to these former workers who made extreme sacrifices in helping our nation win the Cold War. Your decision to designate these workers as part of the SEC has brought relief and closure to victims -- to these victims, who have waited for this result for over 50 years.

Today this Advisory Board convenes once again to discuss designating the remaining employees who worked at the Mallinckrodt downtown site from 1949 through 1957 as members of the Special Exposure Cohort. I have met with many of these former workers and heard about their sufferings firsthand. Several of these workers whom I have had the privilege of meeting are now deceased. In total, over 40 of the former Mallinckrodt workers have died while waiting for dose reconstruction to be performed. They

are victims of what appears to be an endless bureaucratic process.

In light of this, I urge this Advisory Board to designate the remaining former Mallinckrodt workers who worked at the downtown site from 1942 through 1950 -- or excuse me, from 1949 through 1957 as members of the Special Exposure Cohort. There are just too many complicating circumstances and too much unknown information regarding these former workers that make it impossible for NIOSH to proceed with dose reconstruction for the Mallinckrodt claimants with any degree of accuracy and credibility.

As I stated to this Board at its February meeting, there are important documents regarding worker exposure and worker history that are either missing, incomplete or possibly destroyed. There are also documents that indicate that a significant portion of existing worker exposure data is inaccurate and unreliable. We also now know that there was a serious dust problem at the plant, which may have caused significant dust exposures.

Furthermore, we have documented testimony from a former Atomic Energy Commission official that

states that the Mallinckrodt downtown site was one of the two worst plants in the country in terms of levels of radioactive contamination. The Mallinckrodt downtown site had levels of contamination that were over ten times the levels at the Paducah site, which was previously considered one of the worst and is one of the four original Special Exposure Cohort sites.

What is perhaps the most disturbing about the entire EEOICPA process is the pace at which NIOSH and ORAU are proceeding with their responsibilities under the statute. We constantly hear from NIOSH and their partners at ORAU that it is definitely feasible to construct doses and compensate these former workers at the downtown site and other Mallinckrodt sites. Yet in reality, the NIOSH/ORAU team has actually performed dose reconstructions on only a small number of these diseased and dying workers.

As of this week NIOSH has completed approximately 74 dose reconstructions out a total of 311 existing cases at the downtown site. So after several years and expending

over $74 million, NIOSH and ORAU have managed to dose reconstruct only 23 percent of the claimants at the downtown site. In terms of actual compensation of the Mallinckrodt workers, NIOSH record is even worse. There have been 990 total claims filed by former employees at all three former Mallinckrodt sites. Out of this total, NIOSH has compensated only 82, or roughly eight percent, of these claimants. Out of a total of 330 claims at the Mallinckrodt downtown site, NIOSH has paid only 56, or 17 percent of these claimants.

Now while I realize this Board is not tasked today with deciding on the Mallinckrodt Weldon Spring SEC petition, I share with you an interesting statistic. Out of the 168 claims filed by former workers at the Weldon Spring site, NIOSH has denied 148, or almost 90 percent of these claims. These claims are being denied, even though NIOSH has yet to complete a site profile for the Weldon Spring site.

I ask a question. On what basis are these people being denied?

In addition to all this information, it has been 18 months since NIOSH first released its site profile for the downtown Mallinckrodt site -- 18 months. Now NIOSH is still in the process of revising this document due to technical flaws. It should also be noted that it took NIOSH over three years to finalize the Special Exposure Cohort rule which maps out the process for adding any potential sites to the SEC.

Needless to say, this is hardly an impressive record given the amount of time and money NIOSH and ORAU have been given to get these workers compensated under the statute. This extremely slow rate of dose reconstruction and compensation is not consistent with the intent of EEOICPA, which is to compensate these diseased former workers in a timely manner. But it is consistent with the fact that so many workers' records are missing, incomplete or inaccurate, which is why designating these workers as members of the SEC is the only practical solution.

You could ask these victims to wait again in the hopes that records will appear, will be

accurate and will be useful. But for how long? Another three months? Another six months? A year? Longer? Keep in mind that a good portion of these workers, the ones who have not died, have already been waiting for dose reconstruction for over four years now. At some point this Advisory Board has to decide how much time NIOSH and ORAU can spend on each site profile and SEC petition to determine whether or not dose reconstruction is feasible for the class of employees included in the petition. Otherwise the Board runs the risk of allowing NIOSH and ORAU to violate one of the principal tenets of EEOICPA, which is to compensate these cold warriors in a timely manner.

I would argue that a failure to compensate such a large portion of these workers almost five years after enactment is not achieving the intent of EEOICPA. Sadly, for many of these aging cold warriors time is a luxury they simply do not have. These former Mallinckrodt workers are some of the oldest former nuclear workers in the country. As stated previously, many of these former workers have already

passed on as a result of illnesses they occurred -- they incurred while serving their country. I believe it is long past time to compensate these former workers for the heroic sacrifices they made in helping America win the Cold War. Therefore I urge this Board to recognize their plight and designate the remaining workers at the downtown Mallinckrodt site, those who worked from 1949 through 1957, as members of the Special Exposure Cohort. This will give these former workers the compensation they need to pay their medical bills and to provide for their survivors. Please take the reasonable, prudent and just action and help these cold warriors who did so much for this great nation. I thank you for listening.

DR. ZIEMER: Thank you very much, Tom, and I think Denise Brock was also going to make some preliminary remarks. Denise, would you like to do that at this time?

DR. WADE: (Off microphone) She's reading (unintelligible) Congressman Akin.

DR. ZIEMER: And this is, I believe, a statement from Congressman Akin, as well.

MS. BROCK: It is, but actually I also have a statement from Senator Talent.

I would first like to thank the Board again for having me here and for your time. I'd like to thank members of the public, as well. And obviously I don't want to go into my full statement for you today. I'll wait till tomorrow. I just wanted to -- to read something from Senator Talent and from Congressman Akin.

(Reading) Dear Mr. (sic) Ziemer, let me take this opportunity to thank the Board for their time and work in reviewing the Special Exposure Cohort status petitions for the Missouri workers. I appreciate and thank the Board for approving SEC status for those Mallinckrodt workers who worked at the downtown Mallinckrodt site from 1942 until 1948. While this designation is commendable, I must encourage the Board to also give the same SEC status for those downtown Mallinckrodt workers from 1949 until 1957.

These workers have already waited too long for compensation and should not be made to wait any longer. This process has been too slow, and

that has discouraged a lot of people from even applying for compensation under the EEOICPA. I am frustrated by NIOSH's delay in recognizing the dose reconstruction is not possible on every case, and that workers from Mallinckrodt's downtown facility and in Weldon Springs should be included in the cohort. I will continue working with Senator Bond, Representative Akin, Denise Brock and other families of Mallinckrodt workers, and hopefully these cases can be dealt with fairly and promptly so that people get the payments they deserve in a timely manner. Sincerely, Senator Jim Talent.

This next is from Congressman Akin. (Reading) Dear Dr. Ziemer and Advisory Board members, the Board's evaluation of compensation claims and dose reconstruction data pertaining to several sites in the Greater St. Louis area has been of great interest to a number of my constituents, as well as to me. As you know, the NIOSH Advisory Board recently made the decision to designate former nuclear energy workers who worked at the downtown St. Louis Mallinckrodt site from 1942 until 1948 as members of the

Special Exposure Cohort under the EEOICPA of 2000.

I commend the Board for this assessment, which finally brought relief to those who sacrificed for the security of our nation during the Cold War. An important decision lies before you today, whether the remaining employees of the downtown Mallinckrodt site from 1948 until 1957 should be designated as a member of the SEC. I strongly urge the Advisory Board to include these workers under the Special Exposure Cohort.

There is no doubt that the lack of accurate data and missing information has created a situation that makes it virtually impossible for NIOSH to perform precise dose reconstructions. Simply put, these workers and their families have waited long enough for a decision to be rendered. I ask the Board to take reasonable and equitable action in designating these workers as members of the SEC. Thank you for your time in this matter, and I appreciate your diligence in evaluating this issue and for your service to our community. Sincerely, W. Todd Akin, Member of

Congress.

And again, I just want to state that I thank the Board so much for making the recommendation you did for '42 to '48, and I am extremely pleased for Iowa. I -- it was breaking my heart to give something to somebody and then to take it away like that, the emotional trauma that that puts on people was just unbelievable. So God bless you and thank you very much for that.

DR. ZIEMER: Thank you, Denise, for bringing those words from the Congressional delegation. We will take a brief break at this time and -- after which we will resume with the presentations on Mallinckrodt, which include presentations on the revised Technical Basis Document and some -- a report on the review by our Board contractors. So we'll recess now for about 15 minutes.

(Whereupon, a recess was taken from 2:45 p.m. to 3:10 p.m.)

PRESENTATION BY NIOSH

DR. ZIEMER: We're going to return to our session now. We're addressing the Mallinckrodt facility, and we're going to begin with the

presentation by NIOSH. Dr. Jim Neton is going to go over the -- the revision of the site profile. Jim, the podium is yours.

DR. NETON: Okay, thank you, Dr. Ziemer. It's a pleasure to be back again to address the Board. I'm going to talk about Revision 1 to the Mallinckrodt site profile. To give you a little bit of history, as a reminder of where we are in this process, the initial revision, Rev. 0, of this profile was issued in October of 2003, about 18 months ago. And I think I addressed the Board back in the St. Louis meeting at the end of October, 2003, and provided them a summary of what the contents was of Rev. 0 at that time.

SC&A has since, under their task order with the Board, conducted a review of that revision, and in January -- at the end of January 2005 issued their report. Subsequent to that they provided a presentation at the Board meeting February 8th in St. -- is it St. Louis again, I guess? yes -- and it became clear that Rev. 0 was undergoing review by NIOSH at the time and we'd had ongoing discussions with SC&A. And so it was decided at the St. Louis Board meeting that

NIOSH and SC&A would work cooperatively. We would get the -- NIOSH would get the profile, Rev. 1, out the door as quickly as possible, and SC&A would be tasked to do an expedited review of Revision 1, and that has happened. So I am here to speak generically about the update to Revision 0 to you today.

I think I went one slide too far and unfortunately this new projector doesn't recognize the reverse button on --

DR. WADE: Here comes somebody who does.

(Pause)

DR. NETON: Thank you, Chris. The document -- the outline of the document remains exactly identical to what it was before. It's not one of these profiles that has eight -- or six individual chapters or Technical Basis Documents like the large DOE sites. It has eight separate sections, and these are the same sections that were contained in the original Rev. 0.

What's happened since Rev. 0 was issued, though, is the document has doubled in size. It is now -- it went from a 124-page document to a 250-page document. And unlike the Iowa

profile Rev. 1, there really are no major shifts in the -- in the concepts. It is really just a more complete representation of the information, more tables, more data, more instructions as to how to assign surrogate workers, that sort of thing.

What I intend to do is go over briefly each of these sections. Since it's a 250-page document, I have roughly 30 minutes. I figure that's about seven seconds a page, so I don't think I can get into that level of detail with you today, so I intend to go over the highlights of what the document contains to give you a feel, and then entertain any questions.

Just quickly, the section that has changed the most I believe is this section five here, radiological characteristics, conditions and available data. Originally, in Rev. 0, that -- I think that was about 25 pages. It's now over 70 pages, a lot, lot, lot more data about the radiological conditions and a discussion of the available data.

Also the residual contamination section was marked reserved. That is -- that is now

complete and included.
So the purpose and the scope -- and this is a standard, generic purpose for all site profiles -- is to assist in the reconstruction of doses for workers at the Mallinckrodt downtown site. It covers exposures for the seven plants listed here from April '42 through July 1958, and it now covers residual contamination from 1959 through 1995. There's some new models in there, some res-rad runs -- residual radiation runs -- that allow NIOSH and ORAU to assign doses in these periods when production has essentially stopped, but there was contamination remaining at the site.
New to this profile, though, is a discussion of how to reconstruct doses at the St. Louis Airport site, those operations that occurred between 1946 and 1958. If you recall, the St. Louis Airport site was essentially a storage facility for waste from -- from Mallinckrodt. It's appropriately named the airport site because it was near the airport. Essentially all the effluent -- the filter cakes, the byproduct material of the processing of the uranium ores was -- was placed there in various

states over time.
Also the airport site, although dumping ceased there in '58, there is some instructions in the profile of how to reconstruct doses -- residual contamination doses from 1959 to '62.
One thing I'd like to mention here up front, and I think this was noted in the SC&A review of Rev. 1, we do have exposure information in this profile covering doses prior to 1949. Now the Board did recommend that Mallinckrodt be a Special Exposure Cohort between 1942 and '48, and that has been passed on to the Secretary. However, we still have the condition that we have to reconstruct or need to reconstruct doses for non-presumptive cancers under the SEC. We believe that the data contained in the profile right now allows for reconstructing lower bound doses to these organs. We may not be able to maximize and figure out what the upper limit was, but in the situations where NIOSH can re-- can do a partial dose reconstruction and it appears that that reconstructed dose exceeds 50 percent, we're going to attempt that. So the profile doesn't say that, but we need to amend that with a page

change to state that's why those doses remain in the profile. As I said, if the lower bound dose is greater than 50 percent, it will be forwarded to Department of Labor.

A good example of this is the external doses were fairly high at Mallinckrodt in the early days, as we all know. And there are situations -- I'm aware of a particular case where by merely adding up the monitored external dose prior to 1949, there are cases that are likely to be compensable. Now that's a partial estimate. That's a lower bound dose on a person, and we may not be able to reconstruct the internal dose -- maybe we can -- but nonetheless, the person meets the criteria for a POC of greater than 50 percent. So that's the concept of why that's in there.

I will take this opportunity to also say that I'm going to restrict most of my remarks to information that's in the profile relevant to 1949 and later, or more contemporary, because I think it's more germane to the Board's deliberations at this meeting. We certainly are going to continue to work with SC&A in their review and take their comments to heart

prior to 1949, but you know, for -- to cover the matter at hand today, I'd just like to focus on the after-1949 time frame.

Okay. So I want to step through fairly quickly the individual sections. Some of this you've heard before at the previous meetings so I won't dwell on it, but as we all know, Mallinckrodt started work around April 1942, the uranium operations. It was a chemical processing facility at that time and it was converted into a uranium operation. And remarkably, within about three months, almost a ton of uranium dioxide was being produced per day. It's an incredible, incredible feat to accomplish that, so there was a lot of activities going on and we don't need to discuss the high, high exposure conditions that existed in those early time periods. I think we're all fairly well acquainted with that.

As the plant -- as time went on the plant added more and more types of operation. Eventually UF4 was being produced, and in '53 metal was starting to be produced, so a multitude of traditional uranium foundry type operations.

So in the entire operating history --

production history, '42 to '57, more than 50,000 tons of natural uranium products were produced -- a tremendous amount of uranium products. More importantly, these products were produced, to a large extent, from ore that contained the daughter products or the progeny of the decay chain of the uranium series that provided some very hefty exposures, both externally and internally, to the workers. And I'll talk about that in a little bit.

I'd like to discuss a little bit about the health physics operations. This is more relevant to today's discussion. A full scale health physics program did not exist at Mallinckrodt until '47, and did not really get underway until 1948 when -- when a professional health physicist was brought on board, as well as some more involved and intimate collaboration with the Atomic Energy Commission's Health and Safety Laboratory, which possessed some very, very reasonable expertise, some -- in the measurement of radiation in the work environment. They were some of the forerunners in this area.

As noted in the previous meetings, 1945 time

frame -- there was no film badge prior to '45. Film badge monitoring program was established. Urinalysis was not existent until about 1948, at least to the point where there's a reasonable, somewhat routine monitoring program. So again, not to belabor the point from the last meeting, but early operations are -- are very difficult to characterize, but we see the advent of some better monitoring data in the later time periods.

I mentioned by Mallinckrodt and the Atomic Energy Commission performed these air sam-- periodic samplings, other surveys and breath analyses, so you tend to have -- you can have data from both -- both sources, Atomic Energy Commission HASL -- Health and Safety Laboratory -- data and Mallinckrodt data. Again, the external dose is mostly from '46 on; records missing '42 to '45 -- I won't belabor that point. Most importantly here, the context of this profile is for the interpretation of existing records.

This is a very different profile than Iowa, than Bethlehem Steel. This is a more -- what I would call traditional profile that tries to

set the stage for the dose reconstructors. It is an encyclopedia, a road map, a compendium of available monitoring information that, when one starts to do a dose reconstruction, one can go there and find out a lot of information -- detection limits, monitoring frequencies, characteristics, production processes. Again, it's 250 pages. A lot of this is text. It's descriptive text about processes that dose reconstructors would use. So in some sense, the proof of the ability of this profile to work lies in the dose reconstructions that are generated as a result of this. This is something I've said before, but I want to -- I want to clearly state that, because this is not a model, like the Iowa where you have the generic pit. This is I have some monitoring data, I have no monitoring data, how do I interpret that in the context of what happened at Mallinckrodt.

Okay, the history of the site use. This is a short section that goes through the basic operations and I won't dwell on it. It goes through a description of all the different plants and the safety -- some of the safety

issues and problems that were encountered early on, some of the various decontamination surveys that were performed in the later years, and discusses something about the recycling. Mallinckrodt was a uranium manufacturing facility, but at certain periods -- I don't -- this is not to be confused with recycled uranium that contains plutonium. This is recycling of the effluent stream, to some extent, where they were interested in obtaining, for instance, thorium 230 and actinium 227 to provide to Mound Laboratories for other purposes. So they would occasionally go and -- I wouldn't say mine, but retrieve the collection of the informa-- or collection of the waste streams from -- at the St. Louis Airport site, bring it back and reprocess it through the system.

And again, it talks about how most of the waste was taken to St. Louis Airport site after a certain period. It's -- it's the opinion in the profile that most waste didn't remain at the site for very long because it would accumulate and essentially get in the way of the production processes.

The next section is a description of the uranium refining process, quite a bit of relevant information. This is not unlike most uranium processes. There's only so many different ways one can make uranium. Most relevant to our discussion here is the later post-war period, 1950 to '58, maybe part of the '49 era, where -- Mallinckrodt was pretty much on a routine process of receiving ore from Middlesex, processing that ore and making various uranium products. What's happened here, when you get into the 1950 time frame is the processes tended to be more automated, and what you see are process improvements in relation to adding booths or coverage around work areas, attempts to reduce the airborne concentrations in those time periods.

There's a lot of discussion in this profile about those types of activities that took place. There was a -- in 1950 an ore -- ore receiving station was there where ore was ground, just a lot more added to the automation of the process.

In the previous years, prior to say '46, we recognize that it was a very mechanical,

scooping type process. By this time period you have the -- essentially the plumbing, the guts in place for things to move forward in a more automated process so that manual handling, although it did exist, was minimized to a large extent.

There's also discussion of the other processes that were involved. A lot I mentioned, also recovery of -- of some of the thorium 230 material from the St. Louis plant. Also uranium was a fairly valuable commodity, so saw-- piles of saw-- not sawdust, but uranium dust from grinding operations, that sort of thing, were recovered and put back through the process. The mag fluoride slag that was -- that was generated as a result of -- of producing the uranium derbies themselves was recovered -- the uranium was recovered and put back in there. So a lot of different industrial operations that need to be described and they are described in some detail in this document so that one can get a flavor or a sense for the types of activities related to generation of airborne activity, that sort of thing -- whether these were wet processes, dry

processes, a lot of that can be inferred from the document.

Important again, I mentioned the ores and other feed forms. After World War II, most of the ore coming in I believe was foreign ore. Some Canadian ore came in at ten percent uranium by weight. I believe Belgian ore was still coming in and it was extremely high in uranium. I think it was some -- somewhere around 65 percent by weight uranium, I mean tremendous process, interesting to speculate the geochemistry of how something would -- would form in the earth in that concentration in one spot.

So this is all described in this section and goes through the residues and the effluents. There is a section there dealing with -- there was a discussion at the Board meeting last time about how NIOSH is handling the exposure to non-uranium issues when you get into residues and effluents, and I'll discuss that a little later when we talk about internal dosimetry. They do need to be treated differently. By and large, the facility -- to our knowledge -- we only have available information related to the

uranium monitoring in urine, so one needs to make some inferences when we're talking about these special exposures to residues and effluents. I think you'll -- you'll hear some comments later from folks at SC&A about sperry cake.

Okay. This is -- this is really to my liking, the meat of the profile, as a health physicist. This deals -- 75 pages or so of the radiological characteristics and conditions, and most importantly, what type of data do we have to be able to attempt to reconstruct some of these doses.

Units, limits and recommendations, it's interesting that after '49 you're still in the 70 dpm per cubic meter range for uranium as a preferred level or a tolerance limit. In this era, 300 milliroentgen per -- per month was considered to be the limit, so 15 rem per year was the exposure limit, and we have evidence that workers were being exposed in those -- in those -- at those levels.

The radioactivity content and handling of the ore, uranium products and residues really just goes over and has some detail about what --

what are the constituents of these different materials, and what should one use as default assumptions when doing dose reconstructions. For example, there's a section now dealing with ore that talks about a ratio of assuming 100 to one radium to uranium when the ore is -- is -- if you're in a production facility that was handling the ore. Fairly conservative upper limit because I think that's the highest value that was found in the tables.

Uranium products, of course we have available monitoring data for uranium in urine. There are also air dust samples that were taken about the facility, and then the residues and wastes, there are some tables in there for how to deal with the fact that workers may have been processing these thorium residues to be shipped back to Mound, what type of equilibrium values were used, that sort of thing.

Internal dosimetrically there are default values included in here about particle size. The profile right now assumes five micron particle size as a default based on some data that were taken by -- I think it was in the Eisenbud era, I've forgotten, where they came

up with a mass median diameter of around two to three, which roughly, for uranium density, equates to around five microns.

Solubility, there's a table in there that talks about what solubility form should be considered. It is our intent, although I will agree that it's not clear in the profile but it's consistent with our other profiles, where we don't know the solubility in the particular operation we will assume the solubility class from an inhalation perspective that delivers the highest dose to the organ under consideration. That's been part and parcel to our program and we're going to continue to pursue that practice in -- in this -- in these dose reconstructions.

The compensation considerations I talked about, how does one handle these non-uranium -- after -- you know, after the uranium is extracted you have the residues; how do you deal with the composition of these materials based on the isotopic ratios of the radioactive elements that are remaining.

The airborne dust levels, there's -- there's a fair amount of dust level data, thousands of

samples. I'll talk to that a little bit. In the subsequent section there's a discussion of how one deals with these dust samples. There are enough dust data that have been collected by year to assign values in various facilities about the plant, and the profile -- I think there is over 40-something tables in there that list what dust levels to use by job category by year for various plants and facilities.

We're still wrestling with the idea -- again, this is to be used by the dose reconstructors as a road map. One needs to be careful, and we had a discussion this morning about what is relevant, is it the geometric mean of the air dust distribution in a facility or does one use the 95th percentile. We maintain that if -- and we agree with SC&A. If you know nothing else, if you don't know what facility the person worked in and you have no other evidence, then you should use the 95th percentile of the air dust data distribution. However, as you'll see later in the -- in the years that we're talking about here, we have a fair amount of uranium and urine monitoring data that we can use to bracket these exposure

scenarios. And we need to take -- we will take advantage of that when we're doing these analyses, where appropriate.

Respirator use, just to mention briefly, we take no credit in the profile for respirator use, even though we know there were instances where respiratory protection was worn. It's just not possible for us to go back this far in time and make any kind of reasonable estimates as to what percentage of workers wore respirators and who wore them, so you'll see that. Now this makes it a little interesting -- and I'll talk about later -- comparing the urine data to the air sample data because, for example, if you have urine data that is lower than the air sample data, one doesn't know whether that's because the urine data is not appropriate or whether the person happened to be wearing a respirator. There's a number of reasons why those values might not be able to -- to balance.

And there -- there are data in there, and this is new, a fair amount of additional radon monitoring data is in this profile, and there are radon levels by plant. Admittedly, they

are quite variable. Radon is, as we heard this morning, is very difficult to predict. Even if you know the source term you need to know such things as ventilation rate and process through -- through put, that sort of thing. But we believe we have sufficient radon data, as I'll show you in a few seconds, to be able to bracket at least the upper range of the exposures for radon by certain buildings. Okay, just to move through the radiological characteristics, internal dose considerations, there's -- there's a several-page discussion of surface contamination. There are not a lot of surface contamination values listed there. The ones that do exist predictably show some fairly high significant surface contamination levels. There is evidence of some decontamination bound to existing standards at the time that are included in there. But we don't believe, at least from an inhalation perspective, that surface contamination from resuspension is problematic for us because we believe that we have air sample data that would include the resuspension at that time.

So -- and this chapter also summarizes the information and available data based on the urinalysis data, the radon data -- breath analyses I might want to mention just briefly. Radon breath analysis has nothing to do with measuring the radon concentrations or inferring the radon concentrations or exposure to workers in the air at the plant. Radon breath analysis is an indirect technique to measure the radium 226 body burden of the worker. The idea is that if you inhale radium 226 or incorporate it into your skeleton, which is the ultimate repository, you will eventually breathe out radon gas at a certain rate. And knowing the physiology of that and doing a few calculations and calibrations, one can infer how much radium one breathed in by the amount of radon one breathes out. So these are important, but not necessarily related at all to radon levels in the plant. That's going to be important later when I talk about some of the data gaps. Almost -- I'm not aware of any whole body counting data at Mallinckrodt, or lung counts, so we have no ability to rely on those to help bracket -- bracket the pictures. So we have

urinalysis data, a fair amount; we have radon breath analyses and we have radon data, which is not listed here but we certainly have a fair number of those.

External dose considerations, one has the gamut of exposures. You have beta exposures from the uranium, from the protactinium 234-M/and* daughters that grow in. You have gamma exposures from the -- from the progeny in the ore stream. When you have high radium 226 values, you also have high gamma exposures from -- from the ore and the raffinate material, and these non-specific beta-gammas are just mixtures. So you've got a fairly complex mixture.

In this profile, even though there are some high energy photons involved here, it is conservatively assumed that the exposures occurred in the 30 to 250 keV range, which -- if one is familiar with our radiation effectiveness factors -- would double the radiation effec-- it would multiply the dose times two, as far as equivalent risk from the exposure.

Neutrons are not a major issue here. The only

instance where neutrons -- neutron -- there is no monitoring data for neutrons, primarily because it's just a low potential for exposure. One can generate some neutrons based on the alpha interac-- alpha end reaction with light Z materials like fluorene, so for instance, uranium tetrafluoride or thorium tetrafluoride, which I believe was made at one point at Mallinckrodt. One can do some calculations and in fact there is an appendix -- a table at the back that provides neutron dose rates from -- from the alpha end reaction for -- with -- with thorium that can be used to reconstruct some fairly small neutron doses. And there was a radium -- a radium beryllium source, I believe, used in a laboratory -- it was called a shotgun laboratory -- to do some non-destructive testing measurements, and that's discussed in the profile.

Okay, moving along with external dose, film badges were -- were used to measure the external dose. We have a large number of those measurements. It was a standard, two-element film badge with a cadmium filter covering one side and an open window on the other side. Not

a lot of information about procedures for calibration, but we do have evidence that they were radiated and calibrated with a radium source, essentially a radium platinum-clad needle. It was the same film badge used throughout the processing of the plant, from -- we believe through the -- through the production days, anyway, from '49 to '57, for sure, the same dosimeter badge.

Not much in the way of external dosimetry was provided. In the profile that essentially says we have to evaluate that on a case-by-case basis. That of course would only affect dose reconstructions for the extremities where there were large discrepancies in the fields that a worker may be engaged with, such as working in a glove-box or that sort of thing.

Occupational X-ray exams, like all profiles, is discussed here. We are assuming an annual chest X-ray, whether we have indication that the worker was ex-- had an annual chest X-ray or not, and we have no knowledge of the process of the X-ray equipment during that era, but we do have a generic Technical Information Bulletin that talks about what the likely

exposures were to X-ray exams during certain time periods in the past, and that's what's used here.

Of interest here is that between 1942 and '44 I think pelvic exams were required for people working with fluorene compounds, hydrofluoric acid, that sort of thing, and I wasn't familiar with this but apparently fluorosis is an issue where if you have high exposure to the fluorene it tends to wreak havoc with your bones and your connective tissue. And so pelvic exams were used to look for the effects of fluorene on the skeleton.

DR. MELIUS: Pelvic X-rays, I believe. Right?

DR. NETON: Did I say pelvic X-rays?

DR. MELIUS: No, you said --

DR. NETON: Oh, I'm sorry, pelvic X-rays, not pelvic exams, sorry. Thank you, Dr. Melius. I of course am not a physician, so -- yeah, pelvic X-rays.

DR. MELIUS: It had some of us wondering here.

DR. NETON: Okay. Other data included in here at the end of the radiological characteristics are the number of workers by different -- different plants, number of hours worked, so

that one can have an idea -- if they're using surrogate data -- of how many hours per year one should use. In general, it's not -- although there's evidence that people worked additional hours -- Saturdays and overtime, that sort of thing -- somewhere in the area of 40 to 45, 46 hours a week is -- is generally considered to be reasonable for these dose reconstructions.

And there's tables in the back that have delineated the job titles and the work areas of workers based on data from a number of sources. The bioassay records have job titles. The TLD and film badge measurements have job titles, so there's an effort in here to compile and list all of these job titles and work areas for the dose reconstructors.

Now to get to the meat of the issue related -- the monitoring -- related to the monitoring data, I mentioned we -- there's a fair amount of data and I'm only summarizing what's available '49 to '57, although realistically there's not much more than this because prior to '49, as we all know, there weren't -- were very few samples taken. So between '49 and '57

there's about 8,860 or so uranium air samples. These are dust samples taken in the various facilities at the plant. This is the basis of these tables at the back that show what the concentrations of uranium may have been in the air, by facility by year.

I talked about breath radon earlier. There's 2,321 breath radon samples. Those would be used, as I indicated, to infer radium body burdens of workers, not radon air concentrations. There's about 7,200 film badge measurements, but I need to qualify that. That's actually 7,200 person years of film badge data. In other words, these are annual roll-ups, so this is the annual film badge roll-ups for the workers during this time period. And if there were weekly or bi-weekly measurements, then this represents roughly somewhere -- could be 300,000 to 400,000 individual film badge measurements, a large, large number of film badge measurements in this era. And as you'll see later, most of the workers were monitored with film badges at Mallinckrodt in these years.

There's 4,700 radon air samples, approximately.

I've indicated that radon is difficult to estimate because of parameters we talked about earlier -- ventilation rates and emanation rates and all those sort of things. But with these -- this amount of data, 4,700 samples, we believe that it's very possible to put upper limits of exposures by certain facilities for workers. And in fact, we've been using these data in -- to reconstruct some doses for lung cancers. The way our radon lung model works is if you've got some hefty doses that we've seen from some of these areas, it's sufficient in and of itself for compensation in many cases, and where we can we use that to our advantage to do dose reconstruction.

There's a little over 13,000 urine samples that have been taken between '49 and '57, so it's a goodly number of samples. There was a routine program in place during this time period. It was not a routine program that was taken monthly. I would say that the sampling frequency was variable, but it is not unusual to have someone sampled every three to six months in that time frame.

Okay, this is a breakdown of the individual

monitoring data, and we have a column here labeled workers. I should qualify that. These are workers as identified in the Mallinckrodt epidemiologic study that was conducted. And typically epidemiologic studies talk about white male workers, you know, in a certain facility. We believe that it's fairly indicative of the work force. There weren't many female workers allowed into the production area in those eras, or working in the production areas, so we believe this is a fairly reasonable indicator of the work force. And this is the Manhattan Engineering District work force. I don't believe this represents the entire Mallinckrodt facility or the chemical activities, but these are the people who were working in the -- in the Manhattan Engineering District operations.

What you see here, though, is a very interesting picture. I think the lowest percent monitored, whether it's urine or film badge, is around 50 percent between 1959 -- '49 and '57. So we have monitoring data on many of the workers, if not almost all of the workers in the later years. This gives us a fair

amount of comfort that we know what these workers were exposed to with the individual monitoring records, and in fact much of the site profile -- the 250 pages of site profile would not be relevant to many of these workers if we indeed have their -- almost their entire monitoring history. We're really just filling in some gaps, and in some cases may be no gaps. Now I mentioned the urine program was not a weekly/monthly type thing. I think if you look at this and add up the number of samples compared to the number of workers, you end up with maybe a couple of samples per year for a worker or something to that effect. But anyways, you have data. So if we have several urine samples per year on a worker, that is sufficient for us to bracket the worker's exposure to uranium in the plant. It doesn't matter to us -- at least the way we do this -- if there were incidents. The incidents are covered in the urine monitoring program. They would show up, and we can say that if the person was excreting this amount of uranium in their urine, then there is no way that an incident could have moved them above that

level, given certain constraints. So we intend to take advantage of that in this profile. Okay, this gets into chapter -- section six that talks about how you do these radioactive intakes and dose, and this is really where -- how do you use these tables that are in the back. You have these tables that delineate dust concentrations by facility by year. There's also tables that delineate intakes by year for urine. If you -- if you look, you can get -- based on the urine data that were available, ORAU went back and modeled what the intake per year would be in these facilities -- again, based on the urine samples that were available. This gives one the ability to compare intake per year based on urine, based on air sample, to get a feel that they're both in the same ball park. That will become important as I finish up my presentation to address this data integrity issue, I believe. This area here, the estimated intake using time-weighted daily average exposure, that is what is used. The time-weighted daily exposures, we know from the Bethlehem Steel era, is really just what was a person exposed

to throughout the duration of the day, not the peak concentration. And it's a way to get more accurate depiction of what a worker's intake was during the year -- or during the day.

This needs to be looked at. We -- we -- if we only have these data here, without anything to bracket it using the urine data, then we agree with SC&A's assertion that the 95th percentile is more appropriate. If one, however, has urine data to help bracket the intakes, then we're not certain that then one really needs to go to the level of -- of using the 95th percentile, although -- you know, when there is a doubt, we will certainly err on the side of the claimant and be favorable and increase the dose.

And again, these are how to use these tables where you have maybe spotty gaps in the data. They're instructions about how one would fill in those blanks.

Okay, external dose is a very similar thing, although I will state that the external dosimetry section right now has sort of some bold letters on top that says right now do not use a surrogate -- do not use the data that's

in these tables for -- for anything other than limited dose reconstructions. And the reason is that ORAU has not yet completed the evaluation of the -- of the composite external dosimetry data that are available. I mentioned there were a large number of external dosimetry results -- I've forgotten how many -- the annual results by year, but the large number of results have not been tabulated and put into distributions usable by dose reconstructors. There are some data in there that give you a feel for what the doses may have been by facility, but we believe -- to do a better job -- those things need to be filled out in more detail and that's currently ongoing.

I did mention, though, that this does not preclude us from doing dose reconstructions for workers who we happen to have complete monitoring data for. Again, the only reason one would use those surrogate tables is when you have an unmonitored worker, and in most of the time frames we have monitoring data for the vast majority of the workers.

Okay. There are some indi-- there's some data in there about what type of exposure geometries

to use by job category, whether it's locational or anterior/posterior, isotropic, that sort of thing. And photon energy ranges are defaulted, as I mentioned, to three -- 30 -- 30 to 250 keV.

Other external exposures, there's not much in here. I mentioned extremity dosimetry was not very prevalent, almost no data in that area. Submersion in a cloud we believe is only relevant to reconstruction of surficial organs, and that would be handled on a case-by-case basis. And the shallow dose -- right now there are beta dose windows that we believe are -- accurately depict the beta dose and we're taking those at face value and assigning them for shallow dose.

Okay. A little bit at the end of the presentation about these data integrity issues that have been raised, and this is going to be discussed in more detail in Larry Elliott's presentation tomorrow, but I thought I'd briefly touch on it 'cause it certainly is relevant to our ability to reconstruct these doses.

It was raised by the Special Exposure Cohort

petitioners, there's a couple issues, I mention two of them here. One was the practice of recording zero exposures for workers when -- when they were monitored, and our interpretation of that is they were not -- high values were not made zero, but they were recorded as zero if they were not monitored. Internal Mallinckrodt regarding hiding worker exposure results, there's the Mont Mason information that talks about maybe not reporting something to the workers because it might upset them, or something to that effect. These things, in and of themselves, are disturbing. But we believe, given the amount of data and the variety of data that we have after 1948, that we have sufficient data to evaluate the concern. And otherwise, to do a validation almost of the datasets to make ourselves feel comfortable that we're not missing large chunks. Now I have a very brief example here to show you -- I hope you can see it.

This is a hypothetical example. I was hoping to have a real world example based on Mallinckrodt. I didn't have time to get it

together. But we have -- there's three types of data, and I mentioned this at the last meeting. You could have air monitoring data, you can have urine monitoring data, and you also have the source term data. What happened at the plant, what type of mechanical equipment was there to generate airborne, that stuff. And one can -- can compare these three values to see that one has a consistent picture. Now I'm not suggesting that on a -- on a week-by-week basis, or even a month-by-month basis, but on an annual basis I think if we take the aggregate data, one can make a comparison. And again, I just made this up, so this is not a real plant six example, but let's say for instance that we had time-weighted air concentration data that tended to look like this, that started in '49 and trended down in '56 and we would think great, you know, engineering controls are being put in place. Maybe things are going down and everything's hunky-dory.

Now we'll go look at the urine data and we see the urine data is indicating that the picocurie per year intake based on the available data is

way up here. Well, that would certainly raise a flag in my mind because it's almost impossible for these data to be lower -- to be -- this data to be lower than these data, for many reasons, as I mentioned.

Now if we took a source term evaluation and compared it -- for instance, what were they doing -- there -- there are guidance documents out there such as new Reg. 1400 that were really there to say when do you need an air monitoring program, but one can sort of reverse-engineer the calculations and say what would be my predicted range of concentrations -- and I apologize, I don't have uncertainties on here because this is a made-up example, but we could certainly do that -- and compare these two values, the source term, the urine and -- and the air data, and say do we have a problem. And this, in my mind, would clearly indicate that we have a huge issue. Something happened here to artificially lower -- lower the air sample data.

So we can go through, based on these picocurie per year intake evaluations that have been done for the various plants to see at least if

they're consistent in the right area. They're not going to be perfect. I cannot guarantee that there wasn't one sample that has been discounted or something to that effect, but it at least gives you a feel that there was not a wholesale ignoring of important data or hiding or reporting things as zero that were very significant.

So that -- that's the intent of what I wanted to talk about here. We have not done this yet. We certainly intend to go back and do this and demonstrate that we were comfortable with the datasets that we do have.

Okay. With that, I think I've concluded my presentation.

DR. ZIEMER: Thank you very much, Jim. I think we'll open this for questions and then we'll proceed.

Okay, Mark -- Mark Griffon.

MR. GRIFFON: I feel bad you didn't get any questions.

DR. NETON: I was going to say, you weren't going to let me get off that easy, Mark.

MR. GRIFFON: Everybody's getting a little tired.

The film badge data, I'm curious if you have -- you said annual roll-up data. Do you have the monthly data, also, or is it only the annual roll-up data available?

DR. NETON: I think -- I don't think the monthly data are coded. Tim, do you know any more on the monthly data? I wish I knew. I believe that the data exists somewhere, but we have not -- they're not coded, they're not available at this time, but I think -- I think -- I need to check on this, but I'm pretty sure we do.

MR. GRIFFON: And I guess another --

DR. NETON: I'm sorry, Dick -- Dick Toohey seems to --

DR. ZIEMER: Dick Toohey is approaching the mike, ORAU.

DR. TOOHEY: Let me preface this answer with a well-known phrase, to the best of my knowledge and belief, we have the monthly data and it is being entered. And you know, it was in hard copy form so it's being entered into the spreadsheets, so it's not yet analyzed and able to be used for dose reconstruction, but it is on hand.

DR. NETON: Thanks.

DR. ZIEMER: Follow-up, Mark?

MR. GRIFFON: Yeah, not -- not so much -- kind of a different topic. On the -- you mentioned the urinalysis data. All -- all of that is uranium -- total uranium data or gross alpha or what -- what --

DR. NETON: Yeah, it's uranium data -- it's fluorometric, so it's a mass measurement, micrograms per liter, that sort of thing. It's a standard fluorometric technique.

MR. GRIFFON: And they -- and they didn't do any measurements for the other contaminants that you mentioned other than the breath radon for radium.

DR. NETON: That's correct, the breath radon was measured for radium, so -- I think I know where you're driving here is we don't -- we don't have any bioassay data for the -- the daughter products that would have been concentrated in the waste streams, but we do have air data that was measured for alpha dpm per cubic meter, and the profile goes through and guides the dose reconstructor as to what ratios one should assume in those alpha dpm per

cubic meter measurements.

MR. GRIFFON: Based -- based on source -- source term percentages and -- yeah.

DR. NETON: Source term percentages, but there's also the issue -- I know that the sperry cake issue, which is the reprocessing of some of the sperry cake to get the thorium 230 for Mound -- I believe that's what it was for. Those ratios are somewhat different and we do have available data, and I know that Mark has some of those references, as to what the isotopic compensation of the sperry cake were.

MR. GRIFFON: Yeah, I -- I actually just got these references. Janet Westbrook did follow up and -- from a -- I guess that was a workgroup call, I'm not sure what -- anyway, I had requested references on the concentrations of these other contaminants in the sperry cake and the airport cake, and I have them now. And I do have a question on some of -- I -- I'm wondering -- the sperry ca-- maybe you can speak to the sperry cake and airport cake and where that might have been an issue at the plant. Was it only in one area of one building, was it -- how -- how -- where and how

might it have --

DR. NETON: Yeah, I wish I could speak more intelligently about that. It was an effluent stream. I don't know that they had more than one sperry cake filter area, that would be my guess but I really don't know. Janet Westbrook would probably know better. It did end up going out to the St. Louis Airport site, but I -- I can't tell you exactly how widespread it was. I think it was relegated to one particular plant, but I need to check the profile and talk to Janet.

DR. ZIEMER: Jim, let me ask a question that pertains to the Mallinckrodt monitoring data but may also apply to other sites, as well. Most of this time period, the late '40's, early '50's, I think the regs still were addressing perhaps weekly limits, something like that, as opposed to annual limits. I don't even recall when the switch-over occurred. But many sites, once they established that they had met a weekly limit, they felt they were pretty well done. And I've seen sites where they really didn't keep track of -- in fact, they would assign a badge number of some -- to a different

person with the same badge number and so on. Do you run across that in a site like this or are you able to uniquely identify -- is there a consistency where workers, for example, get the same badge number each month or week --

DR. NETON: I don't know about the exact same badge number, but we do have indications that the workers were monitored -- in fact, there are assertions in documents at Mallinckrodt that anyone who entered the Manhattan Engineering District area, the proc-- what we would call the process area, was required to be badged, visitors included. So all worker --

DR. ZIEMER: Did they maintain, for example, annual totals on them, even though that wasn't required, and...

DR. NETON: I can't answer that directly. I know that we have the annual totals. I don't think that they were added up from the individual data because then we would have had it computerized. So they were added up at one point. Now I don't know whether that was done retrospectively by Mallinckrodt or not. But you're right, the exposure was 300 millirem per -- per month --

DR. ZIEMER: Per month.

DR. NETON: -- in those time periods.

DR. ZIEMER: Mark?

MR. GRIFFON: Just a question, Jim, on the -- could you describe the -- I mean I don't know if it was the same over the -- I guess the main question is over the '49 to '55 or '57 time period, the -- the bioassay program for the uranium, what frequency of sampling -- I think they did Monday morning -- could you just expand on a little bit of (unintelligible).

DR. NETON: Yeah, I can only tell you that it certainly wasn't like a monthly sampling program. It was -- it was quarterly, at best, to my knowledge, from what I've seen in the reports.

MR. GRIFFON: Mostly annual, is that --

DR. NETON: Some annual, some quarterly, maybe bi-annual, but it was considered a routine program. Now just because it was annual doesn't mean we can't do anything with it. In fact, that actually drives up our -- our missed dose estimates because you would then have to assume that, you know, when -- what the chronic exposure was that could result in an annual

exposure below that value. But yeah, I don't think more than a couple times a year was probably the average for workers, at most. It wasn't -- it wasn't what you consider like a -- a contemporary program today where you'd have a monthly urine sample that was taken after the end of the -- the weekend, that sort of thing.

MR. GRIFFON: Did -- did you interview any workers on -- on the bioassay practices, former workers, claimants? I think it -- I -- I think the TBD or the -- the site profile mentioned Monday morning sampling before they went on their shift, which -- which is understandable.

DR. NETON: Right. Right.

MR. GRIFFON: I'm just wondering if -- you know, if they -- I've heard some stories, not necessarily at Mallinckrodt but other plants where they say they'd have a -- you know, they'd be off on vacation for two, three weeks, then they'd come back and that'd be the first thing they'd do, so I just wonder if -- you know.

DR. NETON: Yeah, I don't recall that ORAU or NIOSH has interviewed the workers on the urine program.

DR. ZIEMER: Yes, Dr. Melius.

DR. MELIUS: I've been puzzled by your last two slides, which is this presentation of this sort of hypothetical approach that you might use to address some of the data integrity issues raised by the petitioners, I believe --

DR. NETON: Uh-huh.

DR. MELIUS: -- if I understood that --

DR. NETON: Right.

DR. MELIUS: -- correctly. And if I understood you also correctly, you've not really ever -- you haven't done this yet.

DR. NETON: That's correct.

DR. MELIUS: Yeah. And theoretically, if you did do this, one could -- and found a discrepancy of -- of the type you show in your hypothetical slide there, hypothetical example, one could make an adjustment, but one could also end up with a situation where the discrepancies were so great that one would -- that would in fact support the charge by the petitioners and say that look, the data here is so terrible or whatever that we can't pretend to understand it. I mean I just don't quite understand the point of presenting a

hypothetical example of what you haven't done to supposedly explain the proc--

DR. NETON: I think this was -- this was presented in the original SEC -- and we're getting more into the SEC petition evaluation, but in the original SEC petition, when we got to the 1946 through '48 time frame -- '47, '48 time frame -- we had monitoring data, but we didn't have a good handle -- there weren't sufficient monitoring data to bounce one against the other to validate that the data seemed appropriate. So it's our contention that in this time frame we do have sufficient data to do that. You're right, we have not done the analysis yet. I can say that we don't expect this to be the case -- I don't want to prejudge, but it appears from what we've seen so far, there's not been a detailed statistical analysis done, but from looking at the data, they appear consistent in the profile such that the intake per year based on urine data -- and it's in the profile, you can look at it -- and the intake per year based on the air monitoring data appear to be very consistent. I didn't want to show up here with a very incomplete

statistical analysis, so I -- I've just presented what -- what we will do with the -- with the analysis.

DR. MELIUS: With all due respect, I mean I just -- I mean it's very sort of misleading and confusing. I mean you either present the real data and let us evaluate it or don't present anything -- or leave it to the petition review -- evaluation review tomorrow, but I just -- I don't see what purpose this serves.

DR. ZIEMER: Okay, thank you. Other comments or questions?

PRESENTATION BY SC&A

Thank you, Jim. Then we'll proceed with the presentation by our contractor, SCA. Board members should have actually received that report -- well, you had the slides. The report itself was distributed earlier, some -- many that -- do we have the over-- the overheads?

DR. WADE: Yes, we have. They've been distributed.

DR. ZIEMER: Okay. Dr. Makhijani is going to make the presentation. Arjun, are you set to go?

DR. MAKHIJANI: Mr. Chairman, members of the

Board, may I ask Dr. Neton a question --

DR. ZIEMER: Of course.

DR. MAKHIJANI: -- about one of the charts? Dr. Neton, in the urinalysis -- in the chart where you had number of workers and number of urinalysis, were -- were those numbers of urinalyses per year or -- I didn't --

DR. NETON: No, I believe they were individual urinaly--

DR. MAKHIJANI: Oh, they were individuals who were monitored, so we can --

DR. NETON: No, no, they were individual samples, I believe.

DR. MAKHIJANI: They were the number of samples and not the number of workers --

DR. NETON: Wait, wait, wait, wait --

DR. MAKHIJANI: -- who were monitored.

DR. NETON: -- I need to look at the slide again.

DR. MAKHIJANI: Okay. It's -- it's --

DR. NETON: It's been a long day and I apologize.

DR. MAKHIJANI: It's this one (indicating).

DR. NETON: No, this is the number monitored, not the number of samples.

DR. MAKHIJANI: Okay. Thank you.
DR. NETON: That's correct, because there are many more samples than that.
DR. MAKHIJANI: Okay. Thanks. I'm sorry, I was just -- I needed that clarification.
We prepared this with my colleague, Tom Bell, who's not here. The background to this is -- this is the supplemental review -- if I could have the next slide -- of Revision 01. We gave you the review of Revision -- of the basic document, of Revision 0 in your St. Louis meeting in February. You know about the downtown site so I won't -- won't go over what Dr. Neton went through already. Next slide, please.
We -- the background to this review is we began reviewing this shortly after the site profile was published, according to the direction of the Board. That was about in mid-March. We were asked to provide an early draft so we could get some feedback from the subcommittee and from NIOSH, which we did on the 5th of April.
We provided the version you have for the full Board on April 18th. Since we were doing this

in parallel with the Iowa, which was a new document entirely, it was a very crushed schedule. We did not have time and it slipped -- actually to review some of the documents in the six -- five or six boxes that we were sent on CD. Subsequently Tom Bell and I reviewed some of those documents and I'll present a slide of some of the -- brief overview regarding the -- some of the documents in those boxes.

Our review objectives were a little bit more compressed than our normal objectives. We made a comparison of our recommendations. If you'll go to the next slide, please. We -- we made a comparison of what we had recommended and found in Revision 0, evaluated NIOSH's response and evaluated the adequacy of data. We broke that up into two periods, 1942 to 1948 and 1949 to 1957.

In your -- in the report that you have there are three places where this time period is kind of addressed in a compressed summary form that might be useful to you that I might point out. In the preface I listed the sections. In the old review of Revision 0 and in this review

where we address '49 to '57, that might be useful for you. There are also bullet points in a summary table in the front of the review that you just have. There's a kind of a gridded table. They're not all called out by years, but where you don't see '42 to '48 explicitly, you should generally assume that it would apply to '49-'57 and if there are any questions, I'd be happy to clarify. Next slide, please.

This revision did have a significant number of strengths, and I would agree with Dr. Neton, it really is much expanded. It's basically the same format, but there's a lot more detail. I also agree that section five contains a lot more data there. There's much more early data. There's been a very good compilation of data from the '42 to '48 years. There -- a very useful discussion of radiological conditions, more information on film badge type. We had said that there should be an approach defining surrogate worker cohorts and an approach has been described, with some limitations that I'll get into. And of course there are the new sections on the St. Louis Airport storage site

and on the decommissioning period. There are also important questions of detail. There were the questions of geometric standard deviations in Revision 0 that we had pointed out, air concentrations of Mallinckrodt versus AEC that have been partially addressed. And there are all those tables of isotopic ratios that I think would be very useful if the areas can be identified. Next slide, please.

I give you a brief overview of the weaknesses that we found for the early period. Now I think Dr. Neton actually addressed all of this, so I would -- I would just not focus that much on this slide in that, as you will see in the report, we had said that the early period data can be used for minimum dose calculations for compensation but not for anything else. And if I understood Dr. Neton properly, they are going to amend the TBD with a page change saying that that's what the early data can be used for and not for the reasonable claimant-favorable doses or maximum doses. And we would be in agreement with that. That is in our report, that -- that early data can be used for that. So we would withdraw this criticism with -- with the new

information that I just heard. I mean we stand by the report that we have given you and we're pleased that Dr. Neton said that they're going to change the site profile.

The 1949 to '57 period had a sort of longer list of weaknesses. NIOSH did not address a number of the key issues that we raised in Revision 0 to produce claimant-favorable doses. The question of oro-nasal breathing, the choice of solubility when using urinalysis data, the general use of Mallinckrodt versus AEC data in a claimant-favorable way, taking expert input on which jobs were heavy where the larger breathing rate of -- would -- should be taken into account for specific situations and specific jobs, potential for intakes through cuts and burns -- there are a number of issues of detail, some of which might apply to particular areas and some of which apply to the whole plant, that are still not addressed.

There's a very significant question of incidents that is not addressed as to how the doses are going to be calculated from the incidents that are listed. The TBD is much stronger in that it actually talks about many

of the incidents, but dose calculation procedures are not specified in the TBD. Now in the supplement to the SEC evaluation report NIOSH actually describes a potential method to calculate doses from blowouts, and I'll address that in a separate slide. So we actually evaluated a little bit more than the TBD so we could take into account all the analytical procedures that NIOSH has set forth so you would have as much of that before you as possible.

We -- the -- the radon adequacy -- there is a lot more radon data, but there are some questions about radon data adequacy that need to be more fully addressed. Specifically there's a document from Mallinckrodt itself that questions the adequacy of radon data for dose reconstruction purposes up to 1955. That -- that really needs to be analyzed better than the TBD would -- would lead us to believe, and I have some other remarks on radon data a little bit later.

In the internal dose in this period I would agree that there are quite a lot of data, and I had not seen some of the specific numbers that

were put up by Dr. Neton, but I was aware that there is quite a lot of information. There is the question of the interpretation of that external dose information, which I'll mention briefly as I go along.

The question of the surrogate cohort determination is statistically a difficult one, and the site profile has still not specified a method. I know that there are tables in which categories are specified, but when you -- when you don't have certain kinds of information for a particular claimant, the site profile doesn't give you much indication as to how to proceed, and this -- this matter will consider -- concern survivor claimants somewhat more strongly than worker or employee claimants.

And then there's the question of the time-weighting of the air data. Now as Dr. Neton has indicated, we did have a conference call with -- with NIOSH and some members of the Board, and -- and NIOSH did indicate that some of the issues, like the 95 percent values in the absence of other information, oro-nasal breathing and so on NIOSH is addressing on a generic basis and we're pleased that they're

doing that. They're not currently addressed in the site profile, but I -- but SC&A does want to recognize that NIOSH has said that they are addressing these issues. However, they're not currently available for dose reconstruction for Mallinckrodt claimants. Next slide, please.

The question of time-weighting is very important and broadly applicable. We discussed it briefly a little bit in another context, but I thought to go a little bit more deeply here and actually do a sample calculation for you to give you an idea of what the range of numbers involved is.

The Atomic Energy Commission did some time studies. The early -- this was a lot for industrial hygiene purposes, to install ventilation equipment, to reduce dust in the work place and so on. They had a number of these studies. There are -- so each operation was -- was timed, the -- some -- some air concentration samples were taken. Generally the number of air concentration samples were quite small. Some were breathing zone samples. We've had a discussion about characterizing those, but we have not specifically taken it up

in this context and I won't do that again today. If you go to the next slide I can give you a little view of the calculation that I did. There's a table in the report that goes into this in more detail.

We did some calculations for this job category called bomb chargers. There's several type of jobs that are specified under bomb chargers. The bomb -- when you mix the -- mix the uranium tetrafluoride with magnesium flakes and there's an intimate mixture and that was put into a furnace and heated, and then at a certain temperature the uranium tetrafluoride is reduced to uranium metal and the magnesium flakes become magnesium fluoride. So the fluorene goes over from the uranium into the magnesium and you get uranium metal. And so this was the time-weighting data for the bomb chargers operation, so the mixing operation, the loading of the furnace, air concentrations while the furnace was not in oper-- was in operation, not in operation, so all of those detailed data are given in your report. I can point you to the page number if you'd like -- if you'd like to go to the report and refer to

the data. They are on page -- they're toward the end of -- on -- they're on page 28 of your report. There's a table there that will show you all of the data, and then there's the minutes per task and the total minutes per day. And there's a typical day of 495 minutes for this type of job category that is spelled out there, and I -- this is basically a reproduction from the background documents for this one item.

This one item is listed in -- in the Technical Basis Document as one of the time-weighted average concentrations. So what I did basically is I took the first operation which lasts only one and a half minutes, mixing -- but it's 12 -- it occurs 12 times per day, for a total of 18 minutes, and I said suppose you ignore the uncertainties for all of the other operations, but just take into account the uncertainty for this one operation. I also postulated that since the worker would do it many times, they're not trying to go out into the tail of the distribution of the individual air concentration, which would be a rather large number, but I tried to calculate -- I

calculated the 95 percentile -- 95 percent upper confidence limit for the average of what the worker would experience.

Now normally that might not deviate a lot from the actual straight -- straight average, lognormal average. However, in this case, because we have very few measurements -- as you can see, for the mixing we have only three air measurements -- you cannot actually develop a very good statistical distribution so you have to make allowance for the fact of the small number of measurements, and because of the small number of measurements, when you calcu-- and the higher spread in the air concentrations, just the uncertainty for the mixing operation leads to a total intake that is two -- nearly two and a half times, two -- 2.4 times the time-weighted average intake. So you can see the uncertainty makes an enormous amount of difference.

In some operations, like the lunch room or the locker room and so on, the uncertainty doesn't make a lot of difference 'cause the air concentrations are quite low. But if you take the uncertainty in the air concentrations when

the furnace is operating, that itself leads to a total -- by -- alone, one uncertainty alone leads to a total intake which is 3.4 times at the 95 percentile upper confidence limit than this great average. So it's very essential to actually compute the 95 percentile -- 95 percent upper confidence limit in order to resolve these uncertainties in a claimant-favorable way. Unfortunately it turns out that when you have a small number of measurements, this is not an easy thing to do, so we didn't try to -- you know, we didn't have the time actually to develop a full methodology. And in any case, this may be beyond our charge, but we did try to do some illustrative calculations as to why this is essential, and -- and we're glad that NIOSH is -- is looking into it. Next slide, please. Next slide.

I think I've gone over this one, so we can -- essentially the -- the -- it's very important to -- can you go back? Maybe I didn't go over it well enough. Thank you, Kathy.

So it -- the basic recommendation remains the same from before, that it is very important to develop these uncertainties. The one

difficulty that I'd like to point out in this context is that there are some special difficulties that arise in relation to survivor claimants. As I mentioned in the context of Iowa, as well, this is -- because when you need the job descriptions, often the families may not have the detailed job description and the job histories so you -- coworker data and interviews are absolutely essential, and -- and as far as we understood from the task three report, coworker interviews have rarely been conducted. As of January I believe 12 in the whole nuclear weapons complex from the applications that have been evaluated. Next slide, please.

We evaluated the proposed method for calculating doses from blowouts. That is when -- when this reduction takes place, because it's an exothermic reaction, it liberates heat. In going from uranium tetrafluoride to metal, it happens very suddenly. It's already a very high temperature. This kind of accident was not only common at Mallinckrodt, it also occurred at Fernald and it -- not only in the beginning of the operation. This -- this was -

- this was a continuing difficulty. NIOSH has proposed a method in that they've said that they can -- they can go to the first day after the urinalysis and assume that the blowout happened then and produce a claimant-favorable way of actually calculating that. And of course if there were just one blowout and no other exposures of any other solubility type than the single solubility type of uranium tetrafluoride, you could actually do the calculation in this way, provided the urinalyses were frequent enough. So there are a lot of provisos in this. So theoretically it's not an implausible approach, but can it be applied to the situation of Mallinckrodt. The blowouts were -- did happen fairly frequently. I don't know what is the frequency of the blowout but certainly in some periods they would have happened more than once every three or six months, which is the frequency of urinalysis. So you have the question of what happens if you have multiple blowouts. Blowouts were not -- also were not the only type of accident. You also had uranium fires and that would generate some amount of type S

material, which is insoluble material, and so you'd have inhalation of insoluble material from incidents mixed up with type M material, which is more soluble, and the urinalysis data would be quite hard to interpret.

Another problem is that the main intake is uranium tetrafluoride. Then you have most of the material that has been excreted rather rapidly in days and weeks, and what remains over a long period of time is a small amount of the uranium that would be deposited in the bone. And then you have very slow excretion from that that doesn't look that different from type S material. So the interpretation of this urine data in terms of actually relating it to blowouts would seem to be extremely difficult, even if you knew the dates of the blowouts and the frequency of the blowouts. That would be maybe possible to establish for employee claimants if they remembered when the blowouts would be. That's also a long time, but at least more plausible. I think it would be very questionable or very difficult, at least, in the case of survivor claimants because I can't imagine any way that the survivor claimants

would be able to provide data on what might have happened in regard to incidents.
And so while the question -- the method proposed is, on its face, theoretically plausible, the number of difficulties for actually applying this to a practical dose reconstruction and -- and Dr. Neton pointed out that the TBD has to be interpreted in the context of actual dose reconstruction, but Dr. Neton, correct me if I'm wrong, I don't believe that an actual method has been developed for -- for a -- for this in terms of applying to any dose reconstruction. Am I right about that?

DR. NETON: Not exactly.

DR. MAKHIJANI: Okay.

DR. NETON: This is a --

DR. MAKHIJANI: That's what I understood.

DR. NETON: This is a standard technique that one uses to bracket the dose --

DR. MAKHIJANI: Okay.

DR. NETON: -- from an intake --

DR. MAKHIJANI: Well, yeah -- so --

DR. NETON: -- and I just do want to say that it's irrelevant whether there are multiple blowouts or not --

DR. MAKHIJANI: Okay.

DR. NETON: -- the -- if the urine sample represents a time interval of the exposure to the person --

DR. MAKHIJANI: Right.

DR. NETON: -- from the date of the incident or any -- from the previous sample to the current. So whether there's three or four or ten blowouts in that time period does not really come into play here. That's not correct, what you stated.

DR. MAKHIJANI: Well, as I -- as I pointed out, in order to separate the various classes of material, if you're going to have a urinalysis that's very infrequent, it's very difficult to actually separate the intake from type M material and type S material. And because there's intakes of type S material, both from incidents and -- and routine intakes, actually coming up with a method for a claimant-favorable calculation that could be done, would in my -- in our opinion be -- be rather difficult, and I think the applicability -- as I've said, this method is theoretically plausible. It's not an incorrect method. This

can be applied to generate numbers. Whether it can be applied to generate numbers in the case of -- of Mallinckrodt with the frequency of data that exists and the variety of solubilities that were taken in by workers is -- is questionable at the present time, in our view, and we would like to see the actual application of this to the circumstance -- circumstances of Mallinckrodt, especially as -- if six-month samples or annual samples, three months at best, is -- was the state of bioassay, then it would be complex. Next slide, please.

The external dose, the -- I gave an example of a situation where there's a lack of adequate shielding, and the question arises, as it did in Iowa -- you know, where the pits are close to the pelvic area and the badges were worn on the collar or the pocket -- there's a question of the organs that are being exposed. And there's a fair -- very good discussion in the TBD about installing shielding around digester tanks during pitchblende processing, and the question has arisen as to whether the film badge data would adequately capture the

geometry of the exposure, and we do think that NIOSH needs to characterize the geometry of the exposure -- this would not apply to all workers. They'd apply to the specific workers who were involved in pitchblende processing and in those particular digester tank areas. There would be other areas where similar geometry issues may arise and we have not had the chance to do full evaluation.

In our review of Revision 0 we'd also raised some questions in regard to the interpretation of film badge data, the two-element film badges. NIOSH has provided more information on these film badges, but we just have not had the time to actually finish our analysis as to what we would recommend regarding the interpretation of film badge data and what needs to be done to properly interpret it. This would be something that Dr. Behling would have attended to. And as you know, it's just been a pretty crushing amount of work to do and we didn't want to prematurely say something and then not be on the mark. So that's why that -- that -- that piece of work is unfortunately not -- not yet complete. Next slide, please.

Tom Bell and I did a brief review of the documents. I made some notes on some of these documents, and Tom did, too. I -- so I decided to make a little bit of a slide. NIOSH has said that much of the data is captured in the existing TBD. Some of the data from 1953 to '58 are not captured and are going to be put in the revision of the site profile, so we did this brief review.

I was able to confirm that some of the data I looked at were in the TBD. Please bear in mind it's very difficult to actually go through this data, which is raw -- raw -- quite a bit of raw data and relate it to what's in the TBD, which are a lot of average data -- averages with geometric standard deviations, intake calculations and so forth, so it's not a straightforward matter to actually make sure that this -- these data are incorporated.

I looked at some of the external dose data -- now this would be useful only for surrogate data. If you have of course external dose data for a worker that are complete, then -- then some of these issues don't -- don't enter. But Table 33 on external dose does not have 1949 to

1952 data and including 1949 to 1952 data that are in these boxes, and I've been able to identify a couple of documents in this regard. And NIOSH has noted that some of -- the '53 to '57 documents are not yet incorporated. But one of the things that struck me in this review was that in the external dose data in this period there were a number of documents that actually only listed the job categories for the high exposures, above 200 or 300 millirep for a two-week period. So it's not clear how you can actually use this to marry it with job category data in order to come up with an actual profile of a particular job category in relation to the external doses. For some -- for some badge periods there are no job category data because all were below 300 milliroentgen in the badge readings. The -- so the job categories are there only for a small proportion of the data in the documents that I reviewed and I did review several of them. These documents are typically like 80, 90, 100, 100-plus pages. I reviewed a document in relation to radon. The last but one bullet, I'm sorry, has a typo. It says Table 26. It should say Table 25 of

the site profile, it's not Table 26. I apologize for the error.

I tried to compare this document with Table 25 for this particular -- this document relates to radon in the cloth storage room. I've given you the document number. I found that the site profile had actually averaged a number of different places in this general area. The -- the average given in the site profile is seven picocuries per liter, .07 time ten to the minus ten. The average for a five-month period from August 1st to December in this document was given as 0.5 times ten to the minus ten, or about seven times the average, but only for the cloth storage room. And this raised a question in my mind as to how the averaging of radon data is being done and whether we know which specific workers spent how much time in which of these areas. Now this is just one line item in the site profile that reads Feinc/Filter/Cloth Storage Room in Niagara C-3* and so on, and so it seems to be an aggregate of datapoints into a single average with a very large geometric standard deviation of 5.8. And then I could not exactly match it up with this

-- it may be inclusive or not inclusive -- it certainly raised a question in my mind as to how these averages in the site profile are being used and whether they are claimant-favorable. We just did not have time to go through the very large amount of air concentration data to do an evaluation.

Let me sum up for you -- next slide, please. The -- we've already dealt with the early dose question, so I think we have some resolution there. There have been many improvements and much added data in Revision 01 of the site profile. We still believe -- SC&A still believes that there are a significant number of issues of varying difficulty that remain to be resolved before dose reconstruction other than a minimum dose can be done for the 1949 to 1957 period in a reliable way. I'll just tick off some of those points for you.

The question of the integrity of the data on dose reconstruction does need to be resolved, a hypothetical example notwithstanding. We raise this question not in the context of the SEC and any legal interpretation. I have come across issues of fabricated data in the nuclear

weapons complex in other contexts, and sometimes data that has no basis, numbers that are made up, has a significant effect. And sometimes when you evaluate them they don't have a significant effect, but you -- on -- on the total result, but you do have to make a thorough technical evaluation of the issue with the information at hand in order to be confident that the numbers you're coming up for exposures or releases, as the case may be, are -- are reliable or bounding, depending on what kind of calculation you're trying to do. So that's -- that's a piece of work that really remains to be done from the point of view of dose reconstruction.

We don't believe that the data for -- for incident dose reconstruction is as yet adequate in terms of the frequency of incidents and the mixtures of the various types of incidents.

The question of the Mallinckrodt versus the AEC data has been addressed for one datapoint only but not in general.

There are a number of issues that I've alluded to in regard to survivor claimants that are really very important, given that this is a

site at which production work stopped in '57 and there are a number of employees who are -- who have passed away. So the question of coworker information and job-specific information and how all the surrogate data are to be applied is extremely important. And unless it is resolved, I don't see how those dose reconstructions where surrogate data are needed and job descriptions are not easily available, not in the worker record, would -- would be available. Of course if they are detailed in the worker record this would be -- this would be a different matter, but it's a matter that needs to be explicitly addressed. It's mentioned in passing in the report, but I just wanted to call it to your attention that -- that the site profile does contain some discussion of -- of quality problems with respect to the bioassay data, at least until 1951. I've cited the pages for you. It is worthy of review, partly because we did not find how -- how these quality data are resolved in terms of actual dose reconstructions. And as I said, we haven't had -- had the benefit of actually reviewing dose reconstructions so I

don't know if they are addressed well or not. There are still some specific issues, like sperry cake, whose intake potential needs to be addressed. We don't have the position that it was a big or not a big dose. All -- but we do believe that the intake potential from sperry cakes, given the specific radionuclides involved, does need to be addressed.

There needs to be a statistical approach to cohort definition.

And a time-weighting method that is claimant-favorable needs to be developed.

The report also contains some discussion of large particle ingestion which needs to be addressed. Thank you.

DR. ZIEMER: Thank you very much. We have a little time for questions. Let me begin and I'd like to ask maybe both Jim and Arjun to help clarify for me this issue on the bioassay. My understanding, if you had -- let's say you had two bioassay samples, one three months ago, and let's say there was nothing there. And now we find something. And let's assume there were several blowouts in the middle -- or in between sometime -- it was my understanding that what

NIOSH would do would be to assume the -- probably the longest time interval that that intake occurred, for example, the next day after the clean bioassay, so that there was the longest chance for the excretion to get you down to where you find the sample, say three months later, and that you would select the worst solubility class that would deliver the highest dose. Am I understanding that correctly?

DR. NETON: That's correct, we would pick the excretion curve that maximized the dose between those two samples and over-arched any -- you know, any --

MR. GRIFFON: I think --

DR. NETON: -- (unintelligible) the exposure.

MR. GRIFFON: I think you'd actually pick the -- if I can clarify quick-- you'd pick the worst solubility class --

DR. NETON: Yeah.

MR. GRIFFON: -- that would define the highest intake, and then you might apply a different --

DR. NETON: Well, you've got to be careful --

MR. GRIFFON: -- solubility class to dose estimates?

DR. NETON: Yeah, you've got to be careful. You do a mixture of both. You find the highest intake and then use the --

MR. GRIFFON: I don't want to confuse people (unintelligible).

DR. NETON: You need to do it both ways, based on solu-- the two different solubility classes that may be relevant, because you may get a higher intake for a radionuclide -- a solubility class that gives you a lower dose per unit intake, but the intake is much higher, that's what you would assume. So we do this both ways. We're very -- we do this routinely as part of our program. This is not something new that we're adding to the Mallinckrodt evaluations.

DR. ZIEMER: I wanted to make sure I understood that because I wasn't quite clear whether -- how important it was to know exactly when blowouts occurred, if in fact you could bracket with a maximizing kind of claimant-friendly approach to --

DR. NETON: Right.

DR. ZIEMER: -- to gaining what would have to be the maximum intake.

DR. NETON: Correct.

DR. MAKHIJANI: Well, Dr. Ziemer, if -- if you were only talking about one type of intake and one type of solubility, this would not be an issue, as I indicated.

DR. ZIEMER: Well, in fact that's what I'm trying to get some additional clarity on. Even if there were multiple solubilities, would this address that issue?

DR. NETON: Yes, it would. I mean you would -- you would overestimate the dose -- you know, it doesn't matter if you over-- if you -- overestimating techniques, you're going to have an overestimate of the dose. If you pick the worst solubility class and estimate it, that's -- you'll end up with the highest estimate of the --

DR. MAKHIJANI: Am I to understand you're going to apply a -- a class S or a class M, a type S or a type M to the urinalysis interpretation depending on how long an interval you have, because --

DR. NETON: No.

DR. MAKHIJANI: -- some of it will depend on that. When you have continuous -- when you

have continuous intakes, there is no ambiguity that when you're going back from urinalysis to say air concentrations and intake that you would use generally type S 'cause you would get -- you know, you would get the lowest excretion rate and so on. When you have -- when you have incident intakes it does matter when you do the urinalysis relative to the intake and what the solu-- what solubility assis-- assumption will actually maximize your intake. The interval is important in that case, so it's not actually a straightforward matter to say that you're simply going to assume it on the next day or the frequency of blowouts doesn't matter, because if you do the calculations, the -- for incidents, the interval is important.

The second point is that blowouts don't -- are not pure in terms of solubility because you do have metal particles that would be blown out and that would oxidize along with uranium tetrafluoride. And then you have UO2 in the site, as well as uranium chip fires, so we would -- we're not saying it's not possible to do this. We're -- all we're saying is that the data and methodological development as

presented in the supplement is plausible, but not sufficient, in our view, to actually carry out -- carry out a practical dose reconstruction. We'd like to see that.

DR. ZIEMER: Yes, Dick Toohey.

DR. TOOHEY: Yes, I'd like to add some things Dr. Neton said and hopefully clarify it, although I'll probably muddy the waters a bit. The procedure we're talking about in this is assuming what the date of the intake could have been, the day after the last clean sample, and what the solubility class may have been, is what we routinely do for internal dose assessment for all cases where we are analyzing positive bioassay data. And we use the IMBA software to run a number of all plausible scenarios regarding intake dates and solubility classes, and we do not -- we are not interested in necessarily maximizing the intake. What we do do is find the intake pattern that fits the observed data and maximizes the dose to the organ for which we are calculating dose. Because if that organ is a metabolic versus -- or lung, say, then obviously type S, which stays in the lung, will be more claimant-

favorable. If it's a metabolic organ, then a more soluble material is more favorable and the exact -- we don't know a priori, unless there's very good air monitoring data that we can pin the date down to, when that intake occurred or what the chemical form of the material was. So we look at all plausible scenarios with IMBA to calculate the most claimant-favorable dose. So really the objections you are raising are -- are just not relevant. We handle every internal dose assessment the same way.

DR. ZIEMER: Thank you.

DR. MAKHIJANI: I do -- we do have some questions because if -- if you handle all internal dose assessments in the same way, we first of all said that in the specific case of Mallinckrodt the use of type M solubility was mentioned in Revision 0 and that this needed to be changed. It wasn't changed and -- but you've now agreed that this -- this -- this -- this is being done. It was not clear -- to us, anyway -- that in going back from urinalysis to intakes and to organs that the most favorable solubility assumptions are actually being used.

DR. NETON: I think that was a

misinterpretation of Table 28 that lists type M material as an example, because we believe as a dose reconstructor that would be the most commonly encountered form of uranium in certain areas. But clearly in the earlier part of section six it lists the default -- default classes to be used for different solubilities -- you know, different work place exposure conditions, and they're not all type M, so --

DR. MAKHIJANI: Yeah, and we -- this is -- this is clearly a matter -- I mean maybe it is a matter that we need to understand with further discussion. My understanding of the listing of the solubility tables, and I did look at those in the site profile, was that those applied to air intakes. And we do agree that when you're considering the intakes that there are gui-- that there is guidance in the TBD for the dose reconstructor to use the proper solu-- so I don't have a question about that. We -- and we did not raise a question about that earlier on because I do think we understood you properly.

DR. NETON: Right.

DR. MAKHIJANI: We did -- we did raise a question that in going back from urinalysis and

calculating an air concentration and air intake that would be -- an intake by the inhalation pathway, that -- that there did not seem to be a specific guidance and methodology to assume a more -- the most claimant-favorable solubility.

DR. NETON: Yeah, we'd be more than happy to sit down with you -- SC&A and discuss this.

DR. ZIEMER: Yeah, I think this methodology had been explained to the Board in the past, I -- at least that's the way I understood it. And Mark, I think you've confirmed that that was the case, yes. Richard?

DR. TOOHEY: I'd also like to add another comment on the issue of burns, whether chemical or thermal, in accidents and scenarios. There's a vast amount of literature in radiation accident management that shows that even burned skin is still a pretty good barrier against transdermal absorption. In terms of imbedded shrapnel, metallic particles in a blowout, for example, there's also now a lot of data available on Gulf War veterans who have imbedded DU shrapnel on what uptake may be and resulting doses from that. And I'm part of an NCRP committee, we're hopefully getting out a

final report for Council review on a contaminated (unintelligible) model that can be used, if necessary.

DR. ZIEMER: Thank you.

DR. MAKHIJANI: Our point in bringing up many of these issues, just so it is clear as to why they are there -- like the sperry cakes and burns -- NIOSH, in many of its TBDs that we've looked at, does raise issues where doses are just a few millirem. In order to put it to rest, if doses are a few millirem and if it's not an issue and if there is a barrier or sperry cakes are not an issue, these issues have been raised by site experts. I believe it's very important for the credibility of the program that they not be dismissed without an analysis being put --

DR. ZIEMER: Very good.

DR. MAKHIJANI: -- on the table.

DR. ZIEMER: You're quite right.

DR. MAKHIJANI: That's the point.

DR. ZIEMER: Yes, Dr. Melius.

DR. MELIUS: Yeah, in our last meeting there was a -- some -- a long discussion and issues raised about newly-discovered boxes of data,

and I noticed in your report, Arjun, that -- and it may be for NIOSH to answer this, but under your review of the five to six boxes that NIOSH has stated that '53 to '58 data are not captured and will be put in the next revision of the TBD. Given our experiences with Mallinckrodt last time and Iowa, I'd like some explanation of that. It may be straightforward, but -- what do you mean by not captured and then --

DR. NETON: That they have not been considered in -- in the Revision 1 that has been issued. They were not available at the time Revision 1 was done. I'd remind the Board, the history behind this is that we were very close to issuing Revision 1 when Mallin-- when -- when the Revision 0 review came out and we committed to getting Revision 1 out as soon as possible, and that did not allow us sufficient time to review all of those boxes and incorporate them, although we're moving as quickly as we can to incorporate those data and put out, you know, the revision -- if necessary. It may end up being that those data are not as useful as we might think, I don't know. I have not looked

at the data myself.

DR. MELIUS: Thanks for the clarification.

DR. ZIEMER: Yes, Mark.

MR. GRIFFON: I got -- I have a -- a few questions and -- and perhaps some -- maybe ideas for reading for tonight for the Board, certain areas of interest in the -- in the 250-page TBD, can narrow it down a little maybe. I -- Table 13, this might be a question more for -- for Jim, is -- I think it's one of --

DR. ZIEMER: This is TBD Rev. 1 is --

MR. GRIFFON: Yes, page 195, if people have it -- measured daily weighted average exposure concentrations. Can you give me a sense -- it may be in this -- this report, it probably is somewhere, I mean it's a very volumous (sic) report. Can you give me a sense of the weighted average concentrations, what -- what is the -- sort of the end in this equation? How many samples were used to derive these weighted averages? I'm sure it varies, but is that in this report somewhere?

DR. NETON: I believe so, but I can't -- I can't tell you that off the top of my head. It's a pretty large report and --

MR. GRIFFON: Yeah, yeah.
DR. NETON: -- I was not the principal author, but --
MR. GRIFFON: Okay, if you -- if you --
DR. NETON: -- I can certainly get that information for you.
MR. GRIFFON: Right. That's fine.
DR. MAKHIJANI: I don't believe that -- Dr. (sic) Griffon, I don't believe that the detailed data are actually -- in terms of the number of samples, are in the site profile. They are in the underlying documents that are available on the database, which is -- I pointed you to the -- to the table in our report on page 28, which is where that table is drawn from and -- and as you can see, the number of samples for each work -- work -- task is generally quite limited. I've looked at numbers of these, and they're typically two, three, four samples, sometimes only one sample. Of course when you have one sample, you can't do anything with that statistically. And -- and that would -- I haven't looked at all the data, of course, but that would be fairly typical, and you can't actually join all these

datapoints into one distribution because -- because each task has its own characteristic probability distribution for air concentrations that has to be characterized. That's why actually this is somewhat a complex task to --

DR. NETON: Right.

MR. GRIFFON: I guess --

DR. MAKHIJANI: -- come up with a --

DR. NETON: I'd remind the Board again that this is part of the analysis. This profile does not say use exclusively Table 13, plant six as verbatim and insert six dpm per cubic meter for 1956. It's part of the process of a dose reconstructor putting together the mosaic that is a dose reconstruction. If you have some urine data, you have some plant air data, you may look at other intervening years, but it does not necessarily commit the person to using these individual datapoints. Again, it's part of the toolbox for doing a dose reconstruction, and I still submit that the dose reconstructions themselves would stand alone on their own two feet, using this as their guide.

MR. GRIFFON: I -- I understand, Jim. I just -- I think it's important for us to consider the

-- the -- there's a -- there's a volume of data here, nobody disputes that. I think we have to consider the quality of the data --

DR. NETON: Sure.

MR. GRIFFON: -- and -- and the validity of the data, so that -- that's all I'm after --

DR. NETON: Absolutely.

MR. GRIFFON: -- and I'm just using that one table as an example. I just picked one out of --

DR. NETON: Yeah.

MR. GRIFFON: -- out of the 35 or whatever. The next question or -- and along those lines, just on the Table 13, I guess sort of what raised my attention to this was if -- if you end up having to use this as part of your reconstruction, if you don't have your end data and you end up having to use this to estimate intakes, you know, it -- it just -- what raised my question about the number of samples was there was a high degree of variability, at least in some of these jobs, from sample to sample, from -- from weighted average point to weighted average point.

For instance, pilot plant technician, 1,940 in

'56 and then 9.2 in '54 makes me wonder if that's, you know, production related or, you know --

DR. NETON: Sure, and I think you'd find -- and maybe this is one of these profiles that certainly would benefit from a user's guide. You know, we talked about user's guides in these things to assemble these so that one can understand a little better how they would be applied in the field. But I think if you see our past practice, more than likely -- depending on the type of cancer that was being -- the organ that was being reconstructed -- one may go and find the highest dataset among all of those and use that in the dose reconstruction to demonstrate that the probability of causation is less than 50 percent.

So again, they're not -- this is not instructing one to use these individual datapoints where the N equals three or five or one or whatever. It's to give them a sense for the relative magnitude and the distribution, as you pointed out, and -- and use it in that context. So I guess it's very difficult for me

to sit here and say, you know -- to answer your question. This is --

MR. GRIFFON: Yeah -- no, no, I know --

DR. NETON: -- this is insufficient in and of itself. It's a compilation of all the available data at the site, but it -- it's part of a -- the toolbox for dose reconstructing.

MR. GRIFFON: I guess my -- my next, and maybe my last, I know it's getting late in the day here, question -- the -- the urinalysis data that you're using, is it CEDR database or -- or a -- a non-Privacy Act --

DR. NETON: It's CER database --

MR. GRIFFON: CER database.

DR. NETON: -- Center for Epidemiological Research, not CEDR, so it is identified --

MR. GRIFFON: CER database, right, it's --

DR. NETON: Yeah, this is not off the --

MR. GRIFFON: -- just has the names in it instead of the de-identified version --

DR. NETON: Correct.

MR. GRIFFON: -- CEDR. Right?

DR. NETON: Right, I'm not sure that -- I'm not -- this is -- may be on CEDR, as well, I don't know, but --

MR. GRIFFON: It is, it is, yes.
DR. NETON: Okay, but this is the original ORAU-obtained data for their epidemiological --
MR. GRIFFON: It may -- it might be slightly different.
DR. ZIEMER: Richard, additional comment?
DR. TOOHEY: Yeah, just to comment on that. Jim -- Jim's correct, it's the CER data, not the de-identified -- the CEDR, which we found of limited usefulness except for overall (unintelligible) --
MR. GRIFFON: Because you need the names (unintelligible) of course, yeah.
DR. TOOHEY: But what we have done is check the names in the CER data from the old epi studies against the claimant rosters. And when we get bioassay data submitted from DOE or whoever -- what they claim filed, we compare the two --
MR. GRIFFON: Okay.
DR. TOOHEY: -- and see if they jive. If they don't, then we start asking more questions and --
MR. GRIFFON: So you do -- you do have --
DR. TOOHEY: -- pull the strings till we get (unintelligible) --

MR. GRIFFON: -- some raw data that you're using to validate the database data.

DR. TOOHEY: Yes.

MR. GRIFFON: Okay. And that -- that -- then the last question, I guess -- and I -- I also agree with this reference, page 77/78 make for some interesting reading. The second paragraph on page 78 says that because of the questions regarding the validity of the samples, the apparent variations in the sample analysis methods, and even who was doing the analysis, the Mallinckrodt urinalysis data should be used with caution, at least when the data were taken from Barnes prior to about 1951.

DR. NETON: Right, those data would be biased high.

MR. GRIFFON: And -- and -- well, that's your conclusion.

DR. NETON: Well --

MR. GRIFFON: And the previous page --

DR. NETON: -- what the records shows, but --

MR. GRIFFON: Okay.

DR. NETON: -- that was the problem with the Barnes data is their calibration values were low due to precipitation of the uranium out of

the standard solutions, so with a low calibration value, the values were increased, so I mean it's in the --

MR. GRIFFON: I saw some discussion of contaminated blanks, but I -- I don't want to get into the -- you know --

DR. NETON: Okay.

MR. GRIFFON: We can discuss that further I guess tomorrow or whatever.

DR. NETON: Sure.

MR. GRIFFON: But it also sort of truncates it at '51, but on the prior page, page 77, it also says it is not clear who did the urinalyses from '50 to '54. So I -- I guess -- you know, some of -- some of these questions --

DR. NETON: Yeah.

MR. GRIFFON: It just raises the question of are these -- are these data valid in the first place. I mean there's -- there's a lot of it, for sure. It does raise the question of validity.

DR. NETON: Sure.

MR. GRIFFON: So...

DR. ZIEMER: Thank you. Jim Melius.

DR. MELIUS: Just one brief comment along those

lines. You can sit down, Jim. This is a comment. We've been giving you a workout here back and forth, but -- but it refers back to actually a comment that Jim made earlier. With the Iowa site profile and petition we were trying to determine whether -- basically whether the model was allowing the calculation of -- or dose reconstruction with sufficient accuracy -- put it simplistically. And in this case with Mallinckrodt, we're weighing a site profile that's a toolbox, as you describe it, and as to whether that toolbox allows the reconstruction of a dose with sufficient accuracy, and that's a more difficult task and -- 'cause the problem is you use different tools on different individuals, and we don't necessarily have a good sense -- and maybe you don't, either -- of which tools are going to be most commonly used, as well as -- so all we can really do is sort of look at what is the strength and weaknesses of the various tools in there and figure out which are important tools and -- and -- and then make some sort of overall assessment. And so that's sort of the probing that's going on. I don't think it's

necessarily helpful to that probing to say well, this isn't going to be used all the time or this is going to be used -- you know, there's other tools, 'cause we've got to sort of judge each tool and then come to some conclusion as to how we deal with the -- the SEC petition. So I think that's -- I think what Mark was trying to get -- get at, basically -- and I understand it's a long day and it's sort of frustrating, but we sort of have to go through this, I think.

DR. ZIEMER: Go ahead, Richard, and reply.

DR. TOOHEY: Okay, if I may make a comment myself. Believe it or not, I agree with you. We -- it's a toolbox, and which tool is appropriate for a given claim is, to some extent, up to the judgment and experience of the dose reconstructor who is doing that dose reconstruction. Presumably they've got experience, they're familiar with bioassay data analysis and all that and they will make the best judgment.

I do want to mention, though, that the tools in the site profile are tools intended for individual dose reconstruction, which may be a

minimum estimate for a likely compensable, a maximum estimate for a likely non-compensable case, or a best estimate for a case in the middle. Whereas sufficient accuracy, for deciding an SEC petition, is limited to at least putting an upper limit on the dose to each of the 22 organs. And a tool that maybe doesn't quite cut the mustard for a best estimate in one case may be perfectly adequate to put a maximizing limit on an organ dose.

DR. MELIUS: Yeah.

DR. ZIEMER: Thank you. Other comments? We are going to resume our discussion on the Mallinckrodt site and related matters tomorrow morning. We also have a public comment period this evening beginning at 7:15, so we will return here at that time.

I want to ask if there are any housekeeping issues we need to address -- thank you, Arjun -- any housekeeping issues we need to address before we dismiss?

Then we will recess until 7:15. Thank you very much.

(Whereupon, a recess was taken from 5:10 p.m. to 7:15 p.m.)

PUBLIC COMMENT

DR. ZIEMER: Good evening, everyone. We're going to begin our evening public comment session at this time. The logistics and events of this day probably have impacted on the crowd this evening -- the crowd, or lack of a crowd. But in any event, we will proceed.

I'm Paul Ziemer, Chairman of the Advisory Board on Radiation and Worker Health. Ordinarily I spend a bit of time at the beginning of the public comment session talking about the role of the Advisory Board and exactly what we do and that sort of thing. However, for this particular group -- which I suspect tonight largely focuses on St. Louis Mallinckrodt folks and we've been to St. Louis a couple of times and have had public testimony from folks from the Mallinckrodt group. And of course most of the Iowa folks were here earlier and have probably left. But in any event, I think the Mallinckrodt people, the St. Louis people, are quite familiar with the role and operation of this Board so I'm not going to take the time to go through my normal presentation, although there are copies of it for those who may want

it. And I think those will be back on the back table, but in any event, we'll proceed just without that this evening, if that's agreeable. I am going to be looking for the sign-up sheet of those who have signed up. I perused it a moment ago. There were not too many names on there, but I think if Tom Horgan is here -- and there's Tom -- and Tom, in just a moment we'll give you the mike and you'll have the opportunity to speak to us, as well.

I should point out that if -- if you did wish to speak and didn't have the opportunity to sign the sheet, you'll still have an opportunity, in any event, to address the group if you so wish.

Actually the first one on this list here is Dan McKeel. Is Dan here this evening? He was here earlier. And I know that, Board members, Dan has provided us with some material that was passed out earlier, so if Dan isn't here this evening you at least have the material that was distributed by Dan -- and we'll give him another opportunity in a minute.

The other thing before I call other speakers is I would like to make sure that everyone here

attending is aware of what has transpired so far since our meeting opened yesterday. Earlier today the Advisory Board approved a motion to recommend to the Secretary of Health and Human Services that the Iowa petitioners be designated as a class in the Special Exposure Cohort, and that motion was approved and will proceed on up to the Secretary of Health and Human Services. So I don't know if there -- there were some Iowa folks that had signed up to speak tonight, and it may be that they will not feel the need to do so, but I think we do have some Iowa names on the list, as well. We will hear then from Denise Brock, from Tom Horgan, from Dan McKeel -- all representing the petitioners in -- from Mallinckrodt, and I'm sort of looking over here to see who wants to go first, and if -- Denise, if you're prepared to go first --

MS. BROCK: (Off microphone) (Unintelligible) ready in about 30 seconds.

DR. ZIEMER: Thirty seconds, okay.

MS. BROCK: (Off microphone) I'll just wait (unintelligible).

DR. ZIEMER: Then -- yeah, Tom wants me to tell

a few funny stories in the meantime, but we will just momentarily hear from Tom Horgan, representing Senator Bond.

I do want to just double-check and see if any of these Iowa folks are here. Jane Stonger? Anita Loving? Jim Shelton? E.D. Webb? None of those are here then this evening, and that's understandable. They will have felt that their -- their need was completed already.

Dan McKeel, I have already indicated to the Board that we have a document that was made available to us, and I understand that you also will have some additional comments for us this evening, so the Board does have your -- your document, as well.

(Pause)

Tom Horgan, representing Senator Bond's office. Thank you for being with us tonight.

MR. HORGAN: I'm going to put this up here because I'm going to have to refer to some notes. But first of all I -- I just want to say that I -- I found the dialogue today between the contractors and NIOSH very stimulating and very informative. And you know, I probably bet you don't get a lot of

comments like that at these meetings, but I really did, and so...

At any rate, while I was listening to the dialogue today between Mr. (sic) Neton's presentation from OCAS and then followed by Dr. -- let me make sure I get this right -- Makhijani's presentation, I noticed a couple of things. And the first thing I wanted to address had to do with Mr. (sic) Neton's presentation.

I am a little bit disturbed about one thing in his presentation, and that was the use of a hypothetical model to demonstrate -- and I don't know the specific context. I certainly want Mr. (sic) Neton to come up and, you know, if I misspoke, to -- misspeak, to -- to correct it, but the use of a hypothetical model to determine -- to determine -- and -- and -- I guess I got the feeling to justify the ability to do dose reconstruction.

Now a hypothetical model -- and I didn't do well on my SATs, but I think I got this one right, is something that really doesn't exist. It's -- and it's a make-believe example. Now I'm not a scientist, but I have a fairly decent

background in social scientific research, after going to graduate school, and I am concerned that Mr. (sic) Neton used a hypothetical model to illustrate the fact that he could do dose reconstruction on claimants who were involved in real incidents and exposures and circumstances.

That troubles me. But what troubles me even more is a phrase that Mr. (sic) Neton said in his presentation when he was developing his hypothetical mod-- or explaining his hypothetical model. I think it had to do with numbers, and we could check the transcript. But he said something along the lines, when he was explaining it, that the numbers in the hypomodical (sic) that these numbers he just made up. He just made them up. How can you use a hypothetical model and numbers you just made up to do a dose reconstruction on people with real exposures and real events?

Now I don't want to be cynical, but it leads me to question -- as representative of Senator Bond -- has Jim Neton and OCAS -- what else have they just made up to justify dose reconstruction? Is this the only thing? I'm

concerned about that and I want the Board to know that concern.

Number two, in Arjun -- Arjun's presentation there was a slide that says -- and I believe it was slide 13, brief review of CD with documents from five or six boxes, and it was the first bullet. And specifically I'm referring to the -- the boxes contain a large amount of data. It will take significant effort to verify whether data are adequately captured. NIOSH has stated some 1953 to 1958 data are not captured and will be put in the next revision of the TBD.

Well, the next revision of the TBD? And I want to make this clear, and if Mr. (sic) Neton is here, I'd like to ask him. And when he came up with his dialogue, I believe, with Arjun, he said that -- something along the lines -- and I don't -- we'd -- again, we'd have to check the transcripts -- that this will be addressed in our next revision to the site profile. And I guess my question is -- to Jim and Larry at -- and the rest of the gang at OCAS, are you planning to revise this TBD again after this meeting in the future? If -- if anybody wants

to answer that, they can.

DR. ZIEMER: Let me make a general comment and then -- and Jim can certainly answer -- all of the site profiles are subject to updating on a regular basis, certainly as a starting point. But Jim, you may wish to address that.

DR. NETON: Yes, Jim Neton. I think I'll (whereupon, the speaker's microphone failed but the response continued) address the first issue that was raised (unintelligible) -- the first issue (unintelligible).

(Pause)

(Whereupon, the microphone service was restored.) My lucky day. I'd like to address the first issue raised by Tom. The -- I think the -- I'm not sure of the exact title of the slide, but I thought it was hypothetical example, not model. And I'm sorry for the misunderstanding that I -- I must have given -- at least Mr. -- Tom that this was an example that was used or a model that was going to be used to actually make decisions on -- on the data. What I really intended to convey was that this was an example of the approach that is going to be used to validate the individual

sets of monitoring data against each other so that we could have some assurance that this data integrity issue was -- was not a major factor in our dose reconstruction. So I do apologize for -- for giving that misinterpre-- misimpression, but it is not a model that's going to be used for any dose reconstructions at all. I just used it as an example to -- for timeliness purposes. And I think Dr. Melius already pointed that out after my presentation. The second question related to the Revision 2 of the site profile. I indicated that we're under very serious time constraints trying to get Rev. 1 out. The dataset from '53 to '58 we do intend to incorporate. It will be a very short time period for that incorporation, we just did not have time to get it in for this deliberation.

I will point out, as Dr. Ziemer indicated, they are -- profiles are meant to be living documents. We use that term a lot but it is very true. We will put in there what we know to be fact as it's available. And more importantly, as it becomes available we will look at every single dose reconstruction that

may have been done under the previous version to see what effect that additional data may have on the outcome of the cases. No case is closed under this system. Every time a profile is revised, we go back and evaluate those.

MR. HORGAN: Well, in terms of the hypothetical model, that's good to know, 'cause I hope we would use real numbers.

The second issue -- in response to the second issue, so we -- we -- we have the answer to that question. There is going to be another revision to the site profile.

And I've heard -- again, let me remind the Board that we -- this site -- the original site profile was given to us or released 18 months ago. I believe it was October 28th, 2003 at the Adams Mark in St. Louis. We've had Rev. -- Rev. 0, Rev. 1 -- I -- I really can't keep track. My point is, though, and I think Senator Bond touched about it on this speech. Now we know they're planning to do another revision of the site profile -- another one. I've just got to ask a question with the intent of the statute and the timeliness, and he said it's going to be short, but how many times -- I

want to ask the Board -- does NIOSH need to revise the site profile to get it right?

This very well may be a living document. I've heard that a hundred times. While the document is alive and well and maturing after 18 months, there are plenty of Mallinckrodt workers who are dying. And even though it will be a short site profile that -- from what we're told, again, I -- a lot of people don't have a lot of time left. So again, it's a living document after 18 months, but a lot of people are dying. And a lot of people have died within that 18 months.

Finally -- and I guess if I could leave that, in the earlier discussions today it all comes back to an issue that was discussed in the Iowa site profile, very (unintelligible), an issue of credibility.

Finally, today I -- there were a couple of things that were mentioned in the dialogue today regarding the Iowa site profile. On the Iowa site profile I thought I heard Mr. (sic) Ziemer today say, when we were talking about the discussion, that if we had ten years -- and again, let's check the transcript, but if we

had ten years we could probably come up with a dose reconstruction for the Iowa sites or something along -- and it was something along the line about smart people can come up with solutions if they have enough time.

I don't disagree with that. I think while the situations between Mallinckrodt and Iowa are similar but not identical, I think that I may be -- I can't say for sure, but I may be open to an argument that if we did have ten years we could -- on Mallinckrodt downtown we could maybe come up with a dose reconstruction for all the workers. I've got to remind the Board, though, that we don't have ten years and it's been five years since enactment, so we're almost halfway there.

Finally, I also want to remind the Board of something that I thought I heard Dr. Melius touch on today, and I believe Dr. Ziemer said something about it, as well. The Board needs to address the information that they have at hand right now. The cur-- that is the current site profile or TBD, as you have it today, not any new info or site profile that may occur or may develop in the future. What you have

today. Just in the same way that I believe this Board acted on the information they had for the site profiles of Mallinckrodt and the -- and the partial cohort from 1942 (unintelligible) at the February meeting, and the information they had when they acted on the Iowa site profile at the Mallin-- at the St. Louis meeting at the Adams Mark. That's all I wanted to say and I just wanted to make that aware to you today. Thank you.

DR. ZIEMER: Thank you, Tom, for your pointed remarks, and please pass on the regards of this Board to Senator Bond, as well.

Now let's hear from -- I've got Dan McKeel next, and Dan, if you will approach the mike.

DR. MCKEEL: Well, good evening to the Board. As Dr. Ziemer said, I hope you all at least have received my more extended comments that really address both the Rev. 1 of the TBD and also have some insights about the SEC petition that you'll be voting on tomorrow, hopefully. So tonight I wanted to go through some related matters, but to make some emphasis points that I think are -- are important. And I -- I am going to try not to go over the same material

that's in those extended outlines, but I do have to mention that here we have Rev. 1, a greatly expanded and improved document, no doubt, but still one of the deficiencies that I pointed out in -- both in 2003 and 2005 in St. Louis, is still not corrected. And that is that the second paper that has to do -- peer-reviewed paper that has to do with dust studies at Mallinckrodt, this paper here in the Journal of Epidemiology, 1995, is still not included in the TBD Rev. 1. So it does seem to me that there's some miscommunication between actually the program office at NIOSH and their contractor, and Ms. Westbrook, who's preparing the site profile. So I certainly would hope that that situation has improved.

One of the things I'd like to make as a suggestion -- 'cause I think this will come up for many site profiles, and that is that it is impossible to decipher from the Rev. 1 of either Iowa or Mallinckrodt -- to get a good idea of the thoroughness of the search of the available data on those sites. And I think it'd be a great improvement if the Board could at least suggest possibly to NIOSH that when

they prepare a site profile there ought to be a explicit statement that says we consider the following available sources. And for instance, for Mallinckrodt there is no information whether, for example, the EPA superfund records center in Kansas City was searched. Was the National Archives, the (unintelligible) archives, were they searched thoroughly, et cetera. And it seems to me that that's extremely important. And as you know, the vote on the SEC 00112-2 that has to do with the '49 to '57 Mallinckrodt cohort was delayed -- not exclusively for that reason, but because we had to look and decipher what was in six boxes of new material. So you know, maybe if all that data source work were done up front, then there could be a more systematic review of that material and we wouldn't be turning up with all these documents late in the -- late in the course of an SEC evaluation.

And that makes me turn to the analysis that's in the -- of what's in those six boxes. One of the things I was interested in the supplement, in fact, quite fascinated by, was a notation that -- there was one line item that said there

were urinary analysis records for -- for plutonium. Now that line item was not dated and it didn't say whether that was explicitly for Mallinckrodt Destrehan Street or for Weldon Spring. But I bring that up because plutonium being present in -- at either of those sites was really not mentioned in the -- certainly not in the Mallinckrodt Rev. 1 TBD, and it seems to me that that's important enough that that should be at least addressed.

It implies that the DOE field office report saying that there were some 74,000 metric tons of recycled uranium sent to one of those two sites, or to both, has some validity, even though both sites apparently deny that they received any appreciable recycled uranium. So I would think that that ought to be gone into.

The other thing that I would comment about the supplement by NIOSH that they wrote in the review today by SC&A of what was in those boxes on slide 13 was -- my -- my reading of the analysis of what's in those two sets of evaluation of the same boxes is -- is sort of different, NIOSH saying that they -- there were no real surprises that would affect anything,

that they had already captured 19 of the 22 documents. And I think the slide 13 information indicates that SC&A found a lot more information that needs to be digested and that they couldn't even make the evaluation whether the information had been captured in the TBD without further study. So there's sort of a difference there.

Anyway, after the February meetings I was interested enough in what was in those six boxes that I enlisted the help of Ted Hisell* and the Missouri Coalition for the Environment Foundation, and we filed on March the 10th a Freedom of Information request where we sought to know what was in those boxes. We wanted a detailed index, and in particular we wanted to address another issue that seems to me to be of widespread importance for many site profiles, and that was -- we had heard that within those six boxes were material that had to be declassified. And so we now have unclassified but formerly classified documents. And the question was, how much more classified material is there about the Mallinckrodt site and I was also interested in the Weldon Spring site, of

course. And it seems to me that that's a very important question, not only what was declassified but what is still classified and why it's classified.

And it would seem to me that, you know, there could be some information that relates to process and production of uranium that could -- the processes could still be classified, but it didn't seem to me that the data that was in those six boxes -- dust study records and film badge readings and so forth -- didn't seem to me that they ought to be classified 50 years later, and that if they were classified, maybe the reason they were classified was it was inconvenient to release those data into the public realm.

Anyway, that was on March the -- the 10th. I believe the law provides 20 days for a response, and it's now April the 26th and I have not received any response to that request, so I look forward to that in short order. And you know, so Oak Ridge operations, ORAU at NIOSH and the ORISE source vaults, I also wrote to them.

Another comment I have about the technical

basis Rev. 1 is I understand that the SEC petitions had to be separated for Mallinckrodt and Weldon Spring. But it seems to me it would have made sense had the MCW and the Weldon Spring site profiles be constructed in parallel and together and released at the same time. So here we have a stagger of at least 18 months where we've had Rev. 0 and Rev. 1 of Mallinckrodt and we have no site profile yet on Weldon Spring. And I know that's being worked on and I even understand it may be released soon, but it seems to me that that has really created an inequity and a disparity that is unfair for the Weldon Spring workers because we heard in St. Louis voluminous testimony that many workers worked for Mallinckrodt Destrehan Street for many years and then they matriculated out to Weldon Spring. And so if their dose is being reconstructed, that may well be that the part that's at Mallinckrodt is now bolstered by this much-improved Rev. 1, but the dose they received at Weldon Spring is not covered at all by a site profile. So that seems to be a -- a bad way that was handled. My extended remarks -- and I won't go into them

at all, but it does highlight that I think that despite the expanded volume of Rev. 1 of the TBD there are still just enumerable statements that have to do with data completeness, with data ambiguities or uncertainties, data omissions, and there are many, many qualitative statements made like some or almost, things that I can't understand as, you know, an outsider how that could help a dose reconstructor who's trying to make quantitative estimates of a dose received, so I'd just comment on that.

I guess one of the most important things that I would like to address to the Board -- and this goes to tomorrow's decision, hopefully -- and that's got to do with the general situation of data validity. And it seems to me that data validity cuts across various levels of science, and certainly in our longitudinal Alzheimer's studies we have to justify to grant review sections and study sections that our data is valid and it's reliable. And how do we do that? And it seems to me that in arriving at that answer, what we can say is that this data on Mallinckrodt has not been validated and it's

not proven to be reliable, and there's some basic ways to do that.

One way to do that would be to have a gold standard set of data, and that should be available. The gold standard data could be doses calculated -- not reconstructed, but just calculated -- from a set of workers who had complete data, so you could come up with a dose. And then you could give their records -- say with some data purposely omitted in a blinded fashion -- to your dose reconstructors and get them to re-evaluate the dose and see if they came up with a number that was close to the gold standard. And by doing that in a series of cases, you would come up with a validity measure that yes, we can -- the same dose reconstructor, for instance, could reconstruct that dose, plus or minus ten percent standard deviation, whereas another set of dose reconstructors could do it at a validity level of say 25 percent, whatever the number is. But that sort of testing really is -- is very necessary.

Another way to do it is to have the auditors, SC&A, do the same thing and to have them

reconstruct the dose that the NIOSH reconstructors have already done and compare those data. And I understand that that has not yet been done for a single Mallinckrodt worker. So I would like to suggest that if the Board believes that they have to act on what's in hand right now, which I believe they should and could, then they're going to have to act on data that has not been validated. And so I -- I think that's one thing to consider.

As far as the SEC and the accuracy of the data, another thing that they ought to repre-- ought to ask is -- the data is certainly not complete. It may be extensive. There may be a lot of urine samples, lot of air samples, et cetera, but the data is certainly not complete for all workers. So then you have to ask well, of the data that we have, how representative is that data subset of the whole realm of data. And I haven't seen any statements about that, you know, and one way to do that -- and certainly some on the panel are epidemiologists, they should certainly be aware of this -- is you take a population sample, you take a random, unbiased sample of the total

universe of data and you -- and you use that data to estimate data for the whole population. If you don't have that, if you have a biased sample or a random -- or -- or not a random sample, or one that is really just -- this is the data that's not missing, not specified, then you really don't have representative data and you certainly are on shakier ground extrapolating that to a whole class of workers. Final thing I have to say is it seems to me, also, that there -- we are faced again with -- I understand the TBD is a living document, but there's still parts of it that are just plain incomplete. Section seven, for example, dealing with external dose reconstruction, is on hold. Why is it on hold? It's on hold because ORAU hasn't entered some of that data or calculated -- it wasn't clear to me exactly why not. But section seven of this 18-month-long living document is still not complete. So I would ask the Board to please consider those thoughts when you're making this very tough decision. And -- and I do have to say that we -- we're all engaged in applying scientific principles, but we also have a mandate from --

you have a pres-- a mandate from the President of the United States, and there is a strong mandate also from Congress. And I think that you have an obligation to live up to the intent of Congress, and that intent goes to timeliness and accuracy of doing dose reconstructions.

And I agree with Tom Horgan and Senator Bond. I agree and support and applaud the sentiments from Senators Harkin and Grassley that I thought was eloquent in saying that the intent of -- of Congress is not being fulfilled here. And you -- you folks can address that. And I hope and I pray that you will do that tomorrow afternoon. Thank you very much.

DR. ZIEMER: Thank you, Dan, for your insightful remarks. Yes, Jim Neton, please.

DR. NETON: I'm sorry, I'd just like to address two of the statements made by Dr. McKeel, just to correct maybe a misconception.

I think that the plutonium line that was in the -- in the file -- it also caught our interest, indicating there may have been plutonium at Mallinckrodt. In fact, what that was -- at least if it's the one that Dr. McKeel is referring to -- was a reference to a paper on

how to do plutonium chemistry that was sent to Mallinckrodt with the idea that it might be adapted to do thorium analyses, because the chemistry of plutonium and thorium are very similar. And I believe that's the line item that appears that Dr. McKeel was talking about. The second issue is that the documents that were released from the ORAU -- the vaults were not necessarily -- they were not classified, they were stored in classified space and needed to be reviewed for classified content. It's my knowledge -- my knowledge none of the documents that were removed from the vault were previously classified and then declassified.

DR. ZIEMER: Thank you for those clarifications. Denise Brock. And Denise, you're up next, too, if you want to --

MS. BROCK: I really wasn't going to say anything, but I just wanted to address the two things that Dr. Neton had stated. Number one, as far as the plutonium, I believe that was from Mont Mason, if I'm correct -- I could be wrong -- to a Dr. Sheppard*, and could have been to address the thorium, but it could have been plutonium. I have workers on videotape

that I've offered to NIOSH and for the Board to see in reference to numerous things. One of those things was the possibility that plutonium was in fact at the Destrehan Street site. I have workers that are willing to testify to that, but the workers that I have that are living are very ill. We do have some things I believe that are possibly on tape.

And the second thing that I was going to address -- I just forgot, what was the other thing that Dr. Neton had mention -- oh, the boxes. I don't know -- were those on CD from quite some time ago? I mean I thought you just got those boxes, but could they have been on CD? I -- because I -- and I also think, in reference to the -- that 1975 Mont Mason memo, I was with the understanding from the February meeting that you all had just obtained that, and then I found out that you had it since May of 2003.

DR. ZIEMER: I don't know the answer to that, and Mark, do you have a comment or --

MR. GRIFFON: I was going to ask -- I was going to ask for clarification on the first point. Jim, I agree with the statement you made with

the reference you're talking about, but I'm wondering if that's the same one that Dr. McKeel's talking about 'cause I see on page 3 of his letter there's this handwritten note that suggests that there was a shipment from Savannah River. This seems to be a different reference, so I just wanted clarification on where this came from --

DR. MCKEEL: Yes, that note from Savannah River happened to be in paper -- that's a completely different affair. That -- that's -- that's explained in my records. It was on the back of a meeting minutes. I have no idea who wrote that. It just was in -- interesting that it was there. But the reference I'm talking about is in the supplement, just in the list of what was in the boxes. And the reference refers to plutonium urine analyses, and it doesn't refer to a paper, although that may just be a shorthand for a reference to a paper. So --

MR. GRIFFON: But I -- yeah.

DR. MCKEEL: -- so they're two completely different things, but -- but they're two little teeny bits of information talking about plutonium at Mallinckrodt.

MR. GRIFFON: Okay, this --
DR. MCKEEL: That's -- that --
MR. GRIFFON: -- this was new to me, so I -- but I -- I --
DR. MCKEEL: It was new to me, too, and I just thought it might be of interest, whatev-- whatever it means.
DR. ZIEMER: Thank you. Denise, did you have any additional comments for the assembly? Did --
MS. BROCK: (Off microphone) No, I just was going to (unintelligible) --
DR. ZIEMER: Thank you.
MS. BROCK: -- (unintelligible).
DR. ZIEMER: Thank you. Are there any other Mallinckrodt folks who did not have the opportunity to sign up but do wish to address the assembly this evening -- or St. Louis folks? Okay, I -- I do have two others who have signed up -- Tom, did you have an additional comment?
MR. HORGAN: (Off microphone) (Unintelligible) answer to the second question. Denise, you know -- I didn't phrase it right, you know. (On microphone) Come up here and let me know,

but it was my understanding, as well, the so-called Mont Mason rebuttal memo that we got at the 11th and a half hour at the St. Louis meeting, which couldn't be made available and wasn't even brought to the meeting, it's my understanding they just got ahold of that document, NIOSH, and that it was literally hot off the presses.

Now Denise mentioned something that you found out that they've had it since May?

MS. BROCK: (Off microphone) (Unintelligible)

MR. HORGAN: May what? Could you come up and clarify that, 'cause if that's the case we'd like to get some -- an answer to that question.

DR. ZIEMER: This Board got the Mont Mason memo on -- at our meeting there. You were there. Is there some additional information on that, or Dick Toohey, can you address it?

DR. TOOHEY: Go ahead.

MS. BROCK: No, I -- I -- with the understanding that you all got it the same time I did. I'm just curious -- maybe I -- maybe I misunderstood. When did -- when did NIOSH or ORAU come into possession of that memo? Was that -- because at the February meeting it was

my understanding you'd just gotten it.

DR. ZIEMER: I don't know the answer to that. Is there -- Jim Neton, do you know anything about the sort of background on that memo?

DR. NETON: I really think that we would need to go back and look at the transcripts because that was discussed in some detail at the meeting, and I really don't want to use my memory to recall, you know, what happened at that meeting. But I don't -- I don't recall and I need to look at the transcript to see when we got the Mont Mason memo, 'cause it was discussed.

MS. BROCK: Sorry, you just may as well stay up here. About the boxes, have the -- has that all been on CD all this time?

DR. TOOHEY: That's all -- well...

DR. ZIEMER: Richard Toohey, can you address that?

DR. TOOHEY: Yeah. Yeah, that's the question I came up to answer about the memo. Okay, the -- I don't remember the date, but it was the second to last Board meeting when we had just captured these six boxes, which actually got consolidated into five 'cause two of them were

both Weldon Springs and half-full.
Okay. We -- in capturing those, we physically got those boxes, and now I don't know whether we made copies on the site or if we brought the boxes and copied, but -- but in any case, as we copied these things, we scan them and then the documents, you know, get broken apart and put on a CD. So right now, to the best of my knowledge and belief, all those documents are on CD/ROM and have been put in our site research database.

DR. ZIEMER: Okay. Thank you. Dick Toohey, you had signed up to address the assembly, so you're at the mike, please.

DR. TOOHEY: Yeah, as long as I'm here, actually I signed up to answer a couple of the questions Mr. Horgan raised this morning in Senator Bond's remarks. One was the -- I don't remember the exact number, but it was the 140 or so Weldon Springs claims that had been denied -- 148, thank you -- and what was the basis for that denial. The basis was the ORAU Team Technical Information Bulletin Number 2, maximum dose reconstruction for Department of Energy sites, which gives a maximum plausible

dose to a case. And if the probability of compensation (sic) is still well below 50 percent, under the efficiency process allowed by 42 CFR 82 -- I think paragraph (10)(k)(3) -- we can stop at that point because it is very unlikely that any additional research would in fact find this case to be compensable. NIOSH refers to this as one of the efficiency processes for completing dose reconstruction. And since we do not, as you know, yet have a completed site profile for Weldon Spring, that is actually probably the only way we could complete a Weldon Spring case at this point. Speaking of Weldon Spring does come to the point -- it's a partial reason -- the other question was why have only a quarter of the Mallinckrodt claims been done, and Weldon Springs is part of that, because a number of those workers, as we know, went on to work at Weldon Spring. And without having the site profile and the exposure models complete for Weldon Spring, if a worker did not get enough dose from the exposure at Destrehan to become compensable, we cannot complete the dose reconstruction till we've included these other

sources.
Hindsight's always 20/20. Maybe it would have been better off to do Mallinckrodt and Weldon Spring together. But our overall decision-making process on the order in which we pursued the site profiles was roughly in the order of the number of claims from the site.
DR. ZIEMER: Okay. Tom, do you have --
MR. HORGAN: Now I've got to get a clarification.
DR. ZIEMER: -- additional question or comment?
MR. HORGAN: So are you saying that the 23 percent rate of dose reconstruction at the downtown site, which we're dealing with that separate petition right now, is based -- is -- is that way because you're depending on material from Weldon Spring?
DR. TOOHEY: What I am saying is that many workers at Destrehan also worked at Weldon Spring. If the dose they received at Destrehan Street is not sufficient to get them over the 50 percent probability of causation, we cannot complete their dose reconstruction until we include their additional exposure at Weldon Spring.

MR. HORGAN: I -- I -- I'm -- I'm at a loss here because I thought we were dealing with two separate sites, and that -- well, wait, wait, wait, I mean we sub-- she submitted a site profile (sic) that had the two sites together. We were told by NIOSH that you had to split them up. She did. Now I -- I'm a little confused because if -- if this is the case, you know, that we have -- because some of these workers worked at Weldon Spring -- maybe I'm missing something, but none of these -- it seems to me a lot of these people aren't going to get compensated for quite a while because we're going to have to wait till the Weldon Spring site profile's done and all that's done, and I -- I don't know, maybe -- maybe it's above my pay grade, but I -- I don't -- I don't understand.

DR. TOOHEY: Well, no, you are -- you are quite correct in that point. I would also point out, though, that we have provided NIOSH with 9,300 draft dose reconstruction reports and approximately 1,500 revised DR reports, and have provided DR reports for more than half of the cases that have been referred by DOL for

dose reconstruction from the 200 sites across the country. Actually there's 300 sites that are covered, but claims have only been received from about 200 sites. And I realize that sites which are not completed yet are unfair and we had to start somewhere, and where we started was with the sites that had the most number of claims. So Savannah River, Y-12 and so on got most of the attention up front.

Also, we were able to develop exposure models for some sites where there was practically no data available from the site itself, such as Bethlehem Steel. And we have completed I think over 600 claims from Bethlehem Steel.

One of the problems with Mallinckrodt was it's a very complicated site. You had uranium in many different forms in processing, recycled uranium and all that. And in terms of creating the site profile, we did Rev. 0. It did not cover all the claims. The ones that could be done with the data we had available, and generally those would be claims that could be compensated on the basis of that data, we were able to complete. The ones that come to mind would be lung cancer cases, just what we found

in Rev. 0 for radon levels at the site, there's enough of a dose, just that, to make lung cancers compensable, but no other types of cancer.

Rev. 1 includes more data, so we can do more of the Mallinckrodt cases. We may not be able to do all of them. There may be -- some may need to await Rev. 2, and some of them may even need to await completion of Weldon Springs.

Denise, I remember you told me once that it's about half the people who were at Destrehan went on to work at Weldon Springs, or something like that.

MS. BROCK: There's a large volume of people that -- that had actually -- and I think Dr. McKeel had addressed that, too, that had went from Destrehan and a lot of them had moved over to Weldon. My father wasn't one of those workers, but a lot of them did.

But I -- I just had a question, and I understand what you mean about if you don't want to give somebody a denial letter if they have possible exposure at another facility, so you want to see if they're compensable, and I -- I greatly appreciate how -- how you -- you

get the cases that you know you can compensate, but it just hurts my feelings so bad or upsets me when people that -- it's almost like the cases are being prejudged with Weldon Spring, and it would -- to me, it would be costly -- I could be wrong, but if you had maybe a pancreatic cancer, a non-metabolic cancer that is one of the 22 SEC cancers and they, for whatever reason, were an overestimate from Weldon Spring and that case was denied, are you not -- who contacts those people? I mean I have a list of probably almost every claimant, but that seems to me to be prejudging these when in fact there could be an SEC and we're just not sure of -- of the data. That's why I filed a -- a petition on their behalf, as well, so -- I mean I -- I'm going to be the first person to tell you, I love when you compensate these people. But to not compensate them without giving them the benefit of the doubt of a possibility of a cohort, it just doesn't seem fair.

DR. TOOHEY: Well, again, I think the answer to your question there is that the stat-- not the statute but the rule and the implementation

guides say that if we can give a maximum dose to a case, regardless of the site they worked, as long as that -- we have something to base that dose on -- we can't just pull an arbitrary 100 rem out of the air -- and in fact the model we use is based on the highest intakes ever observed across the complex, and our model assumes that this one individual gets these highest intakes from 18 different radionuclides, most of which were not even present at Weldon Springs, and if they're still not compensable, they will never be compensable under dose reconstruction.

MS. BROCK: And I almost hate to get in these discussions because I'm not a scientist or a health physicist, but just for an example, had an -- my father worked, I think everybody knows that, and I also had several uncles that worked there. I had one uncle in particular -- and this was at the Destrehan Street site, but he worked there -- my aunt is 81. My uncle worked there -- missed the 250-day mark, but during that time frame. He was involved in an accident. Well, she doesn't remember what kind of accident, only that he was hospitalized.

And of course, you know, the collation/killation* therapy, nobody even knows what that is, and so if you're saying that you're taking the maximum dose, I don't really understand maximum dose, maximum plausible dose. And what if he was involved in something so horrific -- because he wasn't able to go back to work, they wouldn't allow him after that -- so how do you know it wasn't an episodic event that caused something that would have caused that type of cancer?

DR. TOOHEY: I would just say that the technical basis for our maximum model would cover that. It is so high that it would cover any conceivable sort of intake.

Let me -- I've actually thought of a few other remarks I would like to make, at the risk of being perceived as proud and arrogant, but I would want the Board to remember -- because I've seen some indications today that there seems to be a feeling about that if we do not have very complete and reliable individual monitoring data, we cannot do a dose reconstruction, and that is simply not correct. The rules permit us to do dose reconstruction

based on other data. Granted, individual monitoring data has top priority. If we don't have that, we can use coworker data. Failing that, we can use area monitoring data. Even without that, we can use process knowledge. And in terms of doing health physics and estimating doses, that's what we do all the time.

I would dare say Drs. Roessler and Ziemer remember when they took the certification exam from the American Board of Health Physics they were asked to calculate doses to a worker from a given exposure scenario, given so much cobalt-60 solution running through a pipe. It's what we do all the time. So I simply do not agree, as a professional health physicist with 30 years of experience in dosimetry and 100 publications in the open literature, with the statement that we have to have individual monitoring data that is complete and verified and valid and covers every possibility to do a dose reconstruction that is adequate to make an unambiguous and a correct compensation decision.

I would also mention that the Cohen &

Associates review of the first 20 dose reconstructions selected at random did in fact, to my knowledge, find that -- even though there were some, you know, trips and slips there in some of the dose details -- every dose reconstruction, they agreed, we came up on the right side of compensability. And I see that as the bottom line of this entire project. Thank you.

DR. ZIEMER: Thank you, Richard, for those remarks.

Tom?

MR. HORGAN: I just want to say a couple things. Have you ever inf-- and -- and this very well -- you may be right, this may be very beneficial, but have you ever for-- has NIOSH ever informed Mallinckrodt downtown claimants who are waiting that their dose reconstruction may be indicative (sic) on information coming from Weldon Spring, the -- (off microphone) if you know what I mean.

DR. TOOHEY: I think I know what you mean, and the answer to that question is the claim that is filed with Department of Labor identifies the site at which the Energy employee worked.

MR. HORGAN: Okay, so yes or no?
DR. TOOHEY: So -- well, the employees know where they worked and if we haven't published --
DR. ZIEMER: I think Tom is asking is the employee made --
DR. TOOHEY: Aware of --
DR. ZIEMER: -- aware of the fact that --
DR. TOOHEY: -- where we are --
DR. ZIEMER: -- there's additional information to be determined before their dose reconstruction is completed, something along that line.
MR. HORGAN: Yeah, basically what --
DR. TOOHEY: Okay.
MR. HORGAN: -- I'm trying to say -- what I'm trying to say is the man -- the person who worked at downtown and also worked at Weldon Spring files a claim at downtown. He's waiting for his dose reconstruction for the downtown site. Is he aware -- or he or she aware that -- that the processing of that dose reconstruction may dep-- may depend on information coming from the Weldon Spring site?
DR. ZIEMER: Yes, Larry Elliott has --

MR. ELLIOTT: Let me answer this, if I may, Mr. Horgan. When a claimant files a claim with the Department of Labor, they are asked to list all sites that are under the covered facilities list where they worked. That is a critical component of the eligibility of their claim that DOL must verify, because DOL recognizes, as we do, that multiple site experiences can lead to a compensable claim. And we don't want to miss any dose from another site, and so I just -- I hope that answers your question. So unless there's a claimant that decides that they don't want to list a site, we work hard, DOL works hard to make sure that claimants understand that they have to include all sites. It's to their interests.

MR. HORGAN: (Off microphone) (Unintelligible)

MR. ELLIOTT: Yes, I'm sure that the Department of Labor, in their forms -- they work closely -- the claims examiners work --

MR. HORGAN: (Off microphone) (Unintelligible)

MR. ELLIOTT: You can verify it, but I'm pretty confident in my answer to you, sir, that -- that Department of Labor wants to make sure that the claimants understand to add any -- any

experience from any multiple-site exposures that they might have.

MR. HORGAN: (Off microphone) (Unintelligible)

MR. ELLIOTT: I am very certain of that, sir.

DR. ZIEMER: Thank you very much. I have Richard Miller next on the list.

MR. MILLER: Good evening. I -- Richard Miller with GAP. I couldn't help today during the question and answer session but notice a discussion about contaminated blanks. And I went back to my room and got on my laptop and found Rev. 1 and looked up the section of the pages that discussed the contaminated blank situation, and -- and it look-- and it's not entirely clear how long a time period there were contaminated blanks, one; were there correction factors imposed which would have affected the dose results because it would be subtracted, it wouldn't be added, it would be in a non-conservative direction; and to what degree does this affect the credibility of the data that's the issue here. Can someone address the contaminated blank problem and how many years this went on or -- or months or was this just one incident, and has anybody dug in

and even verified that question? Is that something --

DR. ZIEMER: Jim Neton --

MR. MILLER: -- we can address?

DR. ZIEMER: -- may be able to shed some light on this.

DR. NETON: I'm not prepared to answer that question this evening, but we certainly can look into it and provide an answer.

MR. MILLER: Could I -- I don't want to trouble you, Jim, 'cause I know there's many hours a day that you work, but if this Board's going to have to ask and answer questions on the special cohort, and this is now on the table about -- about the -- you know, this question about -- people are asking how much can we rely on the data here, and this seems to be an interesting data reliability issue that if we could get answered and understand the degree and extent and scope of it and what years it covers and how many samples might be affected so that when we saw the large volume -- I don't want to be in the business of necessarily confusing quantity and quality.

The second thing I just wanted to flag for you

all -- it -- it struck me -- it was -- it came out in the memo that was sprung on the Board and -- and the petitioners at the last meeting in St. Louis was this 33-page memo which -- which -- which some -- some purport -- on the record, at least -- that was written by Mont Mason, and I think others will address its -- its pedigree. I think there's some questions about the pedigree of that memo, and I think careful reading would indicate there's some pedigree issues. But one of the interesting things that was revealed to me, and someone who has spent some time studying Mallinckrodt and kind of digging through the records for the last couple of years, was we kept coming across documents which talked about the I-factor. And I don't know if it jumped out at you, but it jumped out at me because the I-factor was a -- was a factor invented by Mallinckrodt which Mont Mason mentioned in passing in one of his letters, and what the I-factor turns out to be and what -- for the -- was -- was the -- was the mysterious employee threshold that heretofore did not want to be disclosed publicly for fear that this could either not

only cause workers concern, but could cause them to -- and doubt the credibility of management, but could raise liability concerns. And the I-factor was that they -- at -- if you reached 90 percent of this factor, they will remove you from your job.

Now what was the threshold level for the removal of someone from their job? It was 600 rem to the lung. Now at that time the standard was 15 rem to the lung. I think -- it came out of the studies that were done at Rochester, but the AEC used that as their guide. And so it was really stunning to see that you had a 40-fold increase over the recommended level from the AEC being used as the basis for removing people -- 90 percent of that figure for being removed from their job. Which -- which left in my mind, at least -- or planted this seed -- which was, you know, if I had that problem on my hands, I'd have a liability concern, too. What's amazing is how long it took for that actually to find its way in the public domain. I don't know whether this was obvious to the rest of the world, but to me it's pretty stunning and close to barbaric that you would -

- you would accept 540 rem before you decided to remove somebody from their job at this particular facility. And I -- and I -- and I think it's -- and it's -- it's an important equity issue.

The third issue I just wanted to question had to do with -- with the raffinate -- raffinates which we've talked about so many times, and I noticed in the supplement to the SEC that -- that -- that this was addressed at least in terms of concentrations -- or fractions, really, of thorium or fractions of actinium or protactinium and so forth. What I'm trying to figure out is where exactly in the process do people assume, one, that this material would concentrate and the concentration -- I don't mean the concentration levels in the air, but the concentration in the production process. Because as you go through a distillation, whether it's ether extraction or -- I guess they had various acid extraction processes as they went through their uranium refining process. Just the question I had was how do you know what the concentrations are that are being concentrated in the process, because

that's going to speak volumes to what your potential uptakes are going to be.

Now when I -- I heard the discussion today about the sperry cake, and I think that's a significant issue, you know, in terms of -- that Dr. Makhijani raised, but when we looked at the production process when all of these cakes were produced, or filter press material were produced, it was produced by taking lime and mixing it with acid. Right? It was neutralization process that went under in order to get kind of this -- this -- this -- I don't know what you want to call it, paste and or -- or -- or -- or extract. And it seems to me -- there's a lot of questions about is this stuff only in dust form, was it available in a aerosol form if you heat things up and they're warm and then you make -- mix an acid in a base of great difference, you know, you get a reaction, you get a vapor -- you get vapor form -- has this been accounted for?

Now ordinarily I would say who would worry about -- it's only ur -- if it was only uranium. But when you're talking about the isotopes of interest here of some radiologic

significance, it would be interesting to me because when reading the site profile I saw still, even in Rev. 1, very little discussion in detail about the processes by which this went on. There was one discussion about a cloth belt where the material was -- was -- was pressed and -- and it would be scraped off and then it would be put into drums. But there's a -- this is a wet, sloppy process. I mean I -- I worked -- I used to be a mechanic and I remember what industrial processes were like, and filter presses -- you go even into a sewage treatment plant today -- are not neat, pristine processes. It's not -- and it's -- leaving aside whatever aesthetics may be associated with it. And so to the extent that one has a wet, sloppy process by which you're making cake and you're pressing out the liquids and you're separating the solids, I've seen very little discussion about the character and I've seen nothing with respect to worker interviews, which would illuminate this if there's no paper trail to support this.

So I would just welcome further in-- sort of a further exploration of this because it's been

on the table for about a year, and I still don't have a very good answer. Maybe it's 'cause the records aren't there to support it, and maybe the worker interviews are or aren't there to support it, I don't know, you know, Denise, whether you will know, but it seems to me we need to know a lot more about the raffinate part of this process. It seems to me there's a lot of ambiguities, leaving aside the fact that there was an effort made to come up with fractions of activity level.

I just want to comment on the CD issue, just briefly. It's my understanding that the records that are being discussed that were on CD were the six -- five or six boxes of data. They were scanned and put on a CD. It would be great if Dr. McKeel, assuming there's no Privacy Act information, could get it. One of the problems we see to be having -- I remember working on the Freedom of Information Act request trying to get the original memo out of Merril -- on Merril Eisenbud, and we spent two years and didn't get it and fortunately NIOSH produced it for us. We learned that the V2161 shelf record information which was recently

transmitted in the package and we saw the inventory from the Federal Records Center, that request has been hanging out there for several years. And one of the disadvantages I think that those of us on the outside of government have is we -- we file FOIA requests in good faith and we sort of hope someone's digging and get them, and then it's a little hard for us to play a role in the process when this stuff's already been captured in the system and we can't even get it. So I just thought I would pass that along because I do think if ORAU is sitting on this information, it'll be very helpful -- and some of this stuff was collected by ORAU -- it'll be very, very helpful if there were some mechanism that if you file a FOIA request to the Department of Energy, it -- it somehow funnels into the system, gets to you all, you go into your O drive or whatever it's called and it gets back out to the public because we're at -- we're -- there's a lack of symmetry in access to information here.

UNIDENTIFIED: (Off microphone) (Inaudible)

MR. MILLER: It's true, huh? Okay. The last -- the last I guess issue going back to the

liability concerns was the discussion about should -- because AEC was doing a separate monitoring program from the Mallinckrodt and that -- and -- and then -- sort of the argument that was made about why one can separate the pre-'48 time period from the post-'48 period, one of the arguments that was made was well, look, AEC's in the game. And I guess one of the things that I would really like to know is, you know, is there a real sense of validation that AEC will always be consistently more valid than the Mallinckrodt records. There was one discussion of this in the Sanford Cohen report where they evaluated one MCW versus one AEC record. But it seems to me we would want to know whether -- one question is would you always go with the higher of the two in the interest of conservatism? If there's a reason not to do so, why not? But -- but this -- given that we've seen some of the same samples that were supposedly side-by-side come out much higher on one side, much lower on the other, what I question is how broadly can we even embrace the concept that the AEC data is going to be sort of the gold standard that we can

subscribe to, that we can have great confidence in. MCW may -- may have done a lot of sampling, there may be a lot of records, but -- but -- but you know, it's sort of we've got a verification.

Because we have this lack of parity in outcome of results with what we thought were similarly-situated monitoring circumstances, can we actually subscribe to that cutoff date? Can we actually say we now have valid data going forward, post-'48, because we can rely on the fact that AEC data is therefore necessarily valid and MC-- and -- and we'll always be validating Mallinckrodt. And I don't know if there's been an analysis done by -- by anybody to try to prove what I think is more of a hypothesis than necessarily a conclusion, but -- but that's -- those are my thoughts. Thank you.

DR. ZIEMER: Thank you, Richard. Dick Toohey may have a comment on yours.

DR. TOOHEY: Just one. I was looking in my notes on -- on the numbers. We have 315 claims from Destrehan Street and 200 from Weldon Springs. I don't know the exact number, but I

believe that actually represents 400 or possibly fewer individuals, you know, because numbers of workers claim both Destrehan Street and Weldon Springs. And while I was looking for that, I ran across our site profile schedule, which says the Weldon Spring site profile was due to NIOSH for initial review this week. So it won't be too much longer to wait on that, hopefully.

DR. ZIEMER: Okay. Thank you. Let me ask if there are any other individuals in the assembly that wish to address us tonight?

(No responses)

If not, that completes our public comment period. We do thank you all for coming and for either sharing or being a part of this meeting. I would remind you that the Board will resume its deliberations tomorrow morning. The actual discussions will begin shortly after 8:00 o'clock -- 8:15, according to my schedule. So we look forward to seeing many of you at that time. Thank you very much and goodnight, everyone.

(Whereupon, at 8:30 p.m. the meeting adjourned to Wednesday, April 27, 2005 at 8:00 a.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 April 26, 2005; and it is a true and accurate transcript of the testimony captioned herein.

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

WITNESS my hand and official seal this the 26th day of May, 2005.

_____

STEVEN RAY GREEN, CCR

CERTIFIED MERIT COURT REPORTER

CERTIFICATE NUMBER: A-2102