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

+ + + + +

ADVISORY BOARD ON RADIATION AND
WORKER HEALTH

+ + + + +

WORK GROUP ON LAWRENCE BERKELEY
NATIONAL LABORATORY

+ + + + +

FRIDAY
FEBRUARY 3, 2012

+ + + + +

The Subcommittee convened, in the Brussels Room of the Cincinnati Airport Marriott, 2395 Progress Drive, Hebron, Kentucky, at 9:00 a.m., Paul L. Ziemer, Chairman, presiding.

PRESENT:

PAUL L. ZIEMER, Chairman
DAVID B. RICHARDSON, Member*

ALSO PRESENT:

TED KATZ, Designated Federal Official
ELIZABETH BRACKETT, ORAU Team*
RON BUCHANAN, SC&A*
JOE FITZGERALD, SC&A
LARA HUGHES, DCAS
MICHAEL RAFKY, HHS*
JOHN MAURO, SC&A*
JIM NETON, DCAS
MUTTY SHARFI, ORAU Team*
MATTHEW SMITH, ORAU Team*
STEPHEN SPANOS, ORAU Team*
JOHN STIVER, SC&A*

*Participating via telephone

C-O-N-T-E-N-T-S

C-O-N-T-E-N-T-S

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

(9:00 a.m.)

MR. KATZ: Good morning, everyone in the room and on the line.

This is the Advisory Board on Radiation and Worker Health, Lawrence Berkeley National Lab Work Group. And we're just ready to get started.

We'll begin with roll call.

(Roll call.)

Very good. Then the agenda for the meeting is on the Board's website.

Paul, it's your agenda.

Let me just remind everyone on the line to please mute your phones except when you are addressing the group. Press *6 to mute and *6 again to take your phone off of mute.

And we're off.

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

As Ted suggested, if you haven't already looked at it, the agenda is on the website. I just want to take a minute to do kind of an oversight on the agenda and kind of a roadmap of where we will go today.

What we would like to do is have an overview of the Site Profile and the facility from NIOSH, then a review of the SC&A findings. Within the last couple of days, we have gotten some initial responses, which I didn't have at the time that I made the agenda, but we have the initial responses from NIOSH on the findings matrix. So, we can at least go through those.

And the objective today really overall is to kind of orient ourselves to what the issues are for this facility with respect to the findings and the concerns and issues that may need to be resolved, mainly at this time on the Site Profile.

I would like to point out that there was an SEC petition, Petition 160 I

believe is the number or 00160, or some number of zeros in front of it, but Petition 160, a petition for the early years, roughly 1942, I think, to 1961 or 1962, a roughly 20-year period. Maybe Lara will expand on that.

But for the early years, NIOSH found that it could not reconstruct dose with sufficient accuracy, mainly due to internal emitter issues, and that was brought before the Board in 2010. And the Board agreed with NIOSH and recommended to the Secretary of HHS that a Class be added to the Special Exposure Cohort for the LBNL workers, and I won't go through the exact definition at this point. But there is a petition and that has been approved, and that SEC Class does exist already for the early years.

So, we don't have an SEC petition that we're dealing with at this time, any additional petition. So, we are dealing primarily with the Site Profile and I suppose also with some of the early-year issues that

might impact on individuals who do not meet the 250-day requirement or who do not have one of the designated cancers for whom partial dose may be reconstructed. So, there could be some early-year issues that overlap that SEC or the early period.

But, in any event, we're focusing mainly on the Site Profile, the SC&A findings, and then trying to develop some idea of what issues we have to focus on as we move forward.

So, I will give you that as kind of introductory material; also, point out that on what traditionally has been called the O: drive -- and I think it's called something else for the internal people; maybe it's the K: drive or something -- there are a lot of LBNL documents there. So, those are available to look at. Of course, the Site Profile documents are on the website as well.

The other thing I want to mention in that connection, on the Site Profile we are on Revision 2. The initial one is dated 2006.

Revision 1 was April of '07. Revision 2 was May of 2010. And that latest revision, Revision 2, is the one we are working with.

I think, initially, SC&A had reviewed, well, I guess they had initially reviewed Revision 1 pretty much in-depth. They have, I believe, taken at least a preliminary look at Revision 2 and I believe most of the issues carried forward, as I recall, as far as the matrix is concerned.

MR. FITZGERALD: Yes. I think maybe, with the exception of obviously the internal dose issues --

CHAIRMAN ZIEMER: For the early years, right?

MR. FITZGERALD: The early years.

CHAIRMAN ZIEMER: Right, right.

Although I might raise this question now, because it wasn't clear to me, and I don't know why it isn't clear after all these years. But if we had an individual in the early years that didn't have the 250-day

or the required cancer for the SEC, I'll ask Jim Neton, let's say you had some bioassay. You are still allowed to reconstruct some dose.

DR. NETON: Yes.

CHAIRMAN ZIEMER: You can't simply say we can't reconstruct internal dose because --

DR. NETON: Correct. Yes, there is a standard statement now.

CHAIRMAN ZIEMER: Right.

DR. NETON: How we could adopt it at the beginning, but it was --

CHAIRMAN ZIEMER: You couldn't. You can't do the dose for the unknown stuff --

DR. NETON: Correct.

CHAIRMAN ZIEMER: -- that led to the SEC.

DR. NETON: The specific --

CHAIRMAN ZIEMER: The specific things on an individual --

MR. KATZ: Yes, but, actually, in

the letter, that determination that goes with this Class, it specifies that if they have bioassay records --

CHAIRMAN ZIEMER: Right.

MR. KATZ: -- for an individual, they will use those --

CHAIRMAN ZIEMER: Right.

MR. KATZ: -- in their dose reconstruction.

CHAIRMAN ZIEMER: Right.

And then, the only other thing I will mention here in a preliminary way is that SC&A identified nine generic technical issues which seemed to cross many sites. They are listed in the SC&A document. This is SC&A's document of January 22nd, 2010, on page 48.

SC&A has listed or identified what they believe are nine generic technical issues which are -- I think that is sort of a name that is similar to the overarching issues. I guess it means pretty much the same thing. I'm not sure they are all overarching, but

they carry beyond this site at least.

Joe, you may want to speak to those at some point.

MR. FITZGERALD: Sure.

CHAIRMAN ZIEMER: But I would simply point out that go beyond this particular site and it may have to be resolved in a different way, not simply for this site alone.

So, with that as background, let's proceed. Oh, one other thing, and I have indicated it on the agenda, but we will take a midmorning break, a comfort break. We will break for lunch at noon. I have put an adjournment time here of no later than 3:00, but in practice for the Chair, who has to get up to the Taft Center by 4:00 for a smart card update, I suppose 3:00 is pushing it pretty tight. So, we will probably have to adjourn no later than 2:30. We don't have to fill the time to 2:30 if we finish our discussion today. I will use that as sort of an upper

limit.

I know that Joe Fitzgerald has to leave shortly after lunch to catch a plane. So, we will try our best to get most of this done, if we can, by noon. We may have to go over a little bit, but that is sort of the schedule.

So, let's proceed. Lara, are you going to be the one to kick us off here on sort of the overall description of the site and the Site Profile contents?

DR. HUGHES: Okay. Yes, I can try to do that. It's about 250 pages.

CHAIRMAN ZIEMER: Right. And I am not asking that you go through that in detail, but maybe a quick summary.

DR. HUGHES: Yes.

CHAIRMAN ZIEMER: Now keep in mind, of course, both NIOSH and SC&A have delved into this in detail. The Board itself is not focused on this site at all. We did have a description of it when we did the SEC,

but that was very brief. It was an 83.14 type of SEC, which means that there is not a review by SC&A typically. We didn't spend many Work Group meetings dealing with an SEC. It came to the Board from NIOSH. We had a quick overview of it and then voted to approve.

So, this is sort of for the benefit of the Board Members, which would be for me and for Dr. Richardson, who is on the line, and for Dr. Lemen, who is not with us today, but who will rely on the transcript as well as the documents which we all have.

I at least have had some familiarity with Lawrence Berkeley over the years, starting early on, because although I have no conflict, I knew some of the players there very well who worked at the accelerators and the cyclotrons, and also have followed their activities over the years. It is one of the labs that has been very important in the nuclear field.

In spite of that, I was amazed as

I looked through the NIOSH document and looked at the list of activities listed, pages and pages and pages of nuclides in various buildings and rooms throughout that site, and it is a tremendous inventory of radionuclides and a broad spectrum of activities, and so a very complex facility in many ways. It includes not only the radionuclides, but the various accelerators.

So, anyway, Lara, please proceed.

DR. HUGHES: Okay. What's called the Lawrence Berkeley National Laboratory Site for the purposes of EEOICPA is, it is a covered facility starting in 1942 or 1943. I think we start in 1943, right, is when the MED started? And it is covered to the present day, I believe, although I would have to look that up to be sure.

The activities at the site actually started on the campus of the University of California at Berkeley. It started out in one or two buildings, and then

I think in 1945 they started to build what is now Lawrence Berkeley National Laboratory on the hill behind the University. It started out mainly with radiochemistry research and, obviously, the development of the cyclotron by Lawrence, and research data was used to support the Manhattan Project in the early years.

Later on, it went into various fields of research involving the accelerators and really a very broad area of research. I do not have it in front of me to list it all.

The Site Profile for the site is about 250 pages and it is divided into the various sections that we use, the introduction, the general site description, how we deal with the medical X-ray assignment, how we deal with the environmental dose assignment, how we deal with the external and the internal dose assignment.

Do you have any questions?

(No response.)

As Dr. Ziemer mentioned, the SEC for this site was SEC 160, and it covers the years from 1943 to 1961, based on an internal dose reconstruction and feasibility. There is a lack of bioassay data in the years preceding 1961, after which the site had their own bioassay program in place. Before that, they were mainly relying on other sites to provide services to them, and I think the records are a little sparse.

I think that's it.

DR. MAURO: This is John Mauro. I have a quick question. Is that where you are?

CHAIRMAN ZIEMER: Go ahead, John. Yes, go ahead, John.

DR. MAURO: Yes, what was the sea change that occurred in 1961 that led you to the sense that, well, post-1961 we think we can do the internal dose?

DR. HUGHES: The presence of an internal dosimetry program that was, internal bioassay program, that was administered onsite

and analyzed onsite and records kept onsite, if I recall correctly.

DR. MAURO: Okay. There was a clean break there. Something changed substantially.

DR. HUGHES: Yes, but we are not unsure about the dates in this case. There was plenty of records that indicate that they finally decided we need to have our own program onsite, and there were several people, well-known people, that worked in this area and developed a program.

CHAIRMAN ZIEMER: Now, John, if you look in the Evaluation Report of NIOSH on the SEC petition, what you find is that there was a call for a bioassay program in 1961. It started, but only in a very preliminary way. It appeared, at least to some of the folks there, that they weren't really taking it very seriously. It was a very small bioassay program.

At some point, and I forget who it

was; I think it was a person onsite, maybe one of their health physics people or one of the administrators that basically said: you know, we're not doing enough. We're not taking this seriously. We need to bioassay virtually everybody and put them on some kind of a formal program.

There was a massive jump. I think that occurred early 1962, where they went from just a handful of people being bioassayed to virtually the whole lab, a very clean break there.

I don't think that NIOSH at that point -- I believe this is true -- I don't believe at that point they ruled out that there might be SEC issues beyond that, but they said it was pretty clear up to 1962 that they couldn't reconstruct dose. Even though I believe it started in 1961, there's a few, a minimal amount of bioassay. That's why I asked the other question. There are some records before 1962, but there was a very

clear break there, John.

DR. MAURO: Okay. Thank you very much.

CHAIRMAN ZIEMER: Yes.

The other thing that is in this Site Profile that I think is kind of helpful that there is a very extensive record of events that have been identified. It is an attachment to the Site Profile called "The Historical Timeline of Radiation-Exposure-Associated Events," and a lot of them that have been characterized, I guess is the word, that we don't always have at facilities.

We always have cases where there's rumors or sort of reports of things that have happened, but we're not going to be sure when and where. This may not be 100 percent complete, but it is pretty extensive, which I think is helpful.

Let's see, let me ask David, on the line, if you have some questions sort of in general about this site, the work done

there, and so on.

MEMBER RICHARDSON: No. So far, I am following along.

Just one question for clarification. There was a description of the document running to 250 pages. I'm looking at 0049, Revision 2, which runs to 109 pages. I just want to make sure that there's not a longer document that I should have reviewed.

DR. HUGHES: Yes, I'm sorry. That was my mistake.

CHAIRMAN ZIEMER: That is the correct document. It is 109 pages.

MEMBER RICHARDSON: Okay.

DR. HUGHES: Yes.

CHAIRMAN ZIEMER: I have it open here before me, too.

DR. HUGHES: I was at the wrong --

MEMBER RICHARDSON: I think I have been finding the different tables that you have been referring to. So, thank you.

DR. HUGHES: Sorry about that.

CHAIRMAN ZIEMER: Okay. Maybe we can move on to the Site Profile review. Joe, are you going to lead us through that?

MR. FITZGERALD: Yes.

CHAIRMAN ZIEMER: We have both the SC&A document plus a copy of the matrix, which really came out of the appendix of the document, because it was really set up in matrix form to start with.

MR. FITZGERALD: Yes, there was a matrix that summarized the findings. That is attachment 3 to our review of last January, of January 2010.

CHAIRMAN ZIEMER: Right.

MR. FITZGERALD: So, we simply took that attachment and annotated it to bring it up-to-date because the actual review in January 2010 predated the SEC as well as Revision 2 of the Site Profile. So, there's a lot of developments after we finished the review that would need to be reflected.

So, we did not go into a full

technical review. Obviously, the Work Group had not met and we have not been tasked. But we did reflect sort of where things stood. I think your clarification on pre-1961 and the partial assessment, I think that is useful because, again, I think there is a little ambiguity about what we do before and after. But, in a sense, a lot of the issues are still pertinent, relevant, would need to be explored.

We do see some changes, major changes, in the TBD that would seem to be going in the right direction, one of which he just referred to, which was Appendix A. One of our concerns -- in fact, it was the first concern that we will go through -- sort of suggested that maybe a little bit more historic operational information to put things in context would be helpful. We found Appendix A was a big step in that direction.

So, clearly, there were some changes that were responsive to some of the

issues we found over a year ago. But, with that in mind, our review focused on Revision 1. So, a lot of the findings may be tempered or resolved in Revision 2, and we are sort of in a toggle back and forth a little bit. We have not looked at Revision 2 from an analytic standpoint.

CHAIRMAN ZIEMER: Right.

MR. FITZGERALD: Yes.

CHAIRMAN ZIEMER: And I understood that you had some sort of preliminary --

MR. FITZGERALD: Yes.

CHAIRMAN ZIEMER: -- comments as to whether you thought, based on a preliminary reading, whether things are still issues.

MR. FITZGERALD: Yes, yes.

CHAIRMAN ZIEMER: So, understanding that maybe they are, maybe they aren't, but --

MR. FITZGERALD: Right.

CHAIRMAN ZIEMER: -- it seemed to me it would be helpful, if this would be a way

to proceed, to actually look at it issue-by-issue.

MR. FITZGERALD: Yes.

CHAIRMAN ZIEMER: And you tell us your issue. We have Dr. Hughes' responses, and maybe preliminary discussion on each of these and sort of determine what do you have to do yet and, then, what does NIOSH have to do yet. That would give us some idea of what lies before us in terms of scoping out the future.

MR. FITZGERALD: All right.

CHAIRMAN ZIEMER: Okay? And we are looking at, this document has 13 issues in it.

MR. FITZGERALD: Right.

CHAIRMAN ZIEMER: Originally, there were just 12? Were there just 12?

MR. FITZGERALD: I thought there were 13 primary issues. There are some secondary issues, but --

CHAIRMAN ZIEMER: No, when I

looked at the first one --

MR. FITZGERALD: Yes, 13.

CHAIRMAN ZIEMER: -- that was attached to the original report, for some reason I only saw 12 on your original report.

MR. FITZGERALD: Oh, attachment 3? No, the main body of the report shows 13 findings. I'm just looking at attachment 3 to make sure that was complete.

CHAIRMAN ZIEMER: Well, anyway, yes, there are 13 currently.

MR. FITZGERALD: Yes, there's 13 in attachment 3 as well.

CHAIRMAN ZIEMER: So, that's what we're working with.

MR. FITZGERALD: Yes, 13 findings. Like I said before, these are what we would term the primary findings. There are some secondary ones for information's sake.

CHAIRMAN ZIEMER: Is there overlap? I didn't lay it side-by-side. Is there overlap on the generics?

MR. FITZGERALD: No. I mean, I think the generic ones were judgments that some of the findings seemed to have resonance with other sites, and we just listed them, one-liners, essentially one-liners.

CHAIRMAN ZIEMER: Right.

MR. FITZGERALD: But the details are in the body.

CHAIRMAN ZIEMER: Okay.

MR. FITZGERALD: There is some overlap, but these are, by extension, judgments that were made.

CHAIRMAN ZIEMER: And some of these are sort of site-specific even though they are part of a generic issue.

MR. FITZGERALD: Yes. I mean, I think what we have tried to do in the Site Profiles is look beyond the site-specific findings to say, you know, we have heard these before. In fact, I will mention it as we go, that some of these, we have seen these in other sites and they would have some relevance

for those other sites.

CHAIRMAN ZIEMER: Right.

MR. FITZGERALD: In fact, at this stage of the game, the program is mature enough that a lot of the issues, particularly when we get to neutrons and what have you, you know, we have been there before. I think we can almost use the shorthand saying NTA film, energy, dependence, and be almost done with it in a way --

CHAIRMAN ZIEMER: Right.

MR. FITZGERALD: -- because these older TBDs don't reflect the thinking that has evolved at NIOSH. And so, clearly, we don't want to repeat all of that.

CHAIRMAN ZIEMER: Right.

MR. FITZGERALD: But that new positioning needs to be reflected in the TBD. I don't think there will be any disagreement at the table.

Starting with the first issue, simply put, we think the historic context, the

operational information that is provided in the Berkeley TBD could be strengthened. By comparison with some of the other multipurpose energy research laboratories, like Brookhaven and Argonne, that have been done via Site Profiles, this one seems to fall short.

I mean, I'm very familiar with Brookhaven's since I was involved with Brookhaven. And also, I have looked at Argonne. Those labs, those reports walk through the operations. Because these labs are very old, it gives you an historic perspective of the accelerators, when they came up-to-speed, what kind of operations were involved, timeframes, when they were dismantled in some cases, some of the source-terms. That perspective was, I think, very helpful.

For some reason, we have the tables, the essential dose reconstruction tables, in Berkeley, but we are missing sort of the historic context. And I think, as I

said earlier, Appendix A helps. That was added in Rev 2 to give you a chronology of incidents and those kinds of developments. But I think, still, what you are missing is a facility-by-facility description in a timeframe that just walks you through the cyclotron and some of the other facilities.

Berkeley has a very rich history, I think as you pointed out. That history, I think, just as a backdrop, would be helpful to have in there. It was helpful for Brookhaven; I know that. I think it would be helpful here. That is the essence of this finding, is that it would be very helpful to have that added in.

And again, we haven't looked at Appendix A in detail. I think that helps. But I think that would be an adjunct to that.

CHAIRMAN ZIEMER: Well, okay, let's discuss that for a minute because NIOSH at least has suggested here that there is additional information that may or could be

added, that it might require some additional data capture.

But, in that connection, for example, let me take -- oh, I'm looking at a section -- let's say occupational internal dose. That has been evaluated by nuclide or by major nuclides, plutonium, uranium, tritium, tritides, so on. What would be needed there? Are you talking about looking at different facilities and saying, what unique issues would they have?

I mean, it is one thing to evaluate bioassay data where you have it. Are you talking about clarifying exposure sources at, say, the X-inch cyclotron, whichever one --

MR. FITZGERALD: Yes.

CHAIRMAN ZIEMER: -- or a particular lab? What is the specificity we're after here?

MR. FITZGERALD: Yes, really focus on the site description. I mean, you're

stepping one step back from the very specific internal/external --

CHAIRMAN ZIEMER: So, it would go back to Section 2?

MR. FITZGERALD: Yes.

CHAIRMAN ZIEMER: Site description?

MR. FITZGERALD: The easiest way I can describe this is look at Brookhaven, look at Argonne, look at some of the other multipurpose energy research labs, and I thought those were done pretty well in terms of providing an operational backdrop, before you get to the nuts-and-bolts dosimetry, an operation backdrop to what happened when, where. Very simply, that's it.

I mean, I think that piece is missing from this particular Site Profile. We found it valuable, I think, in terms of the deliberations on Brookhaven and Argonne. When you have a 50-, 60-year-old energy research lab, obviously, that has all these different

source-terms, all of these various accelerators, all of these different machines, it is just you start getting lost in the trees.

I think that was almost a good roadmap before you got into the dosimetry as to when you step back and look at this site over those 50-60 years, what happened when and how did this thing develop in terms of the research that was done, and kind of some sense of the types of operations and the types of source-terms that might be associated with that in sort of a 20,000-30,000-foot level before getting into the dosimetry.

I think with Berkeley you sort of jump right into the room-by-room, building-by-building dosimetry before you have that layout. I think it is more than just stylistic. I think it was helpful having that roadmap for Brookhaven and some of the other laboratories.

DR. NETON: I think we would

agree. I agree. I actually agree we could benefit from some additional fleshing-out of the facilities --

MR. FITZGERALD: Right.

DR. NETON: -- when they came online, what their purposes were, that sort of thing. It definitely is different. It is lacking compared to the other Site Profiles.

Now some of that may be in Appendix A. Some of that actually exists in the Evaluation Report. If you look at the 160 Evaluation Report, there is a description of when the original calutrons were developed at Berkeley and that sort of thing.

CHAIRMAN ZIEMER: Right. That could be translated back into here.

DR. NETON: Yes, I think so.

CHAIRMAN ZIEMER: And maybe some additional fleshing-out.

DR. NETON: Right, the accelerator, you know, progression of the accelerators and the isolation of the various

radionuclides, the chemistry that was performed to extract the different isotopes, plutonium, uranium, that sort of thing. I think it does; it is helpful to have that at the beginning. For whatever reason, this Site Profile is unlike the others in that respect.

CHAIRMAN ZIEMER: Okay.

DR. NETON: I don't know that it affects the dose reconstruction necessarily, but I do think, for completeness sake, it would be helpful to have in there.

DR. MAURO: This is John. One more point related to this.

In thinking about the level of granularity, I noticed that the other comments, many of them deal with external exposure. So, this issue within the context of the other issues, it would be helpful to have a level of granularity in the description of the operations and sources that provides a richness that helps in supporting the way in which the external doses will be

reconstructed, especially during the covered period.

In other words, sort of like marry the level of detail that you might need in order to support those particular exposure scenarios that will be performed. Those seem to be especially true for neutron. I guess there are some penetrating/non-penetrating issues.

So, the degree to which the descriptive material could help support the development of the external dosimetry part of this, essentially --

DR. NETON: I agree, John. I mean, without sort of the source-term fleshed-out, you really don't have -- you know, this Site Profile is geared toward the radiological monitoring operations and how we can interpret them. But, in some ways, it is hard to say, well, was that an appropriate radiological monitoring program if you really haven't established exactly what was present --

CHAIRMAN ZIEMER: Right, right.

DR. NETON: -- at which time. So, I agree.

CHAIRMAN ZIEMER: So, the next step on this one, it appears, then, is that NIOSH would go back and develop this for I guess what would be Rev 3 then or Rev --

DR. NETON: Three.

CHAIRMAN ZIEMER: -- Rev 3?

DR. NETON: Yes.

CHAIRMAN ZIEMER: I notice here that it indicates that it will require additional data capture. Is that where we are lacking? Or do we have the data and it just hasn't been entered? Or do we know at this point?

DR. NETON: Obviously, I don't know the answer to that one. This response was just recently drafted. So, I might defer to ORAU, who put this response together, as to why we think we might need additional data capture, in other words, to describe the

facility.

CHAIRMAN ZIEMER: Yes. We have the records, but they really weren't fleshed-out. Or do we really need to go back? Maybe both.

DR. NETON: I suspect it might be both, but --

DR. HUGHES: We certainly do have a lot of background information on the sites. A lot of it is available on the open literature anyway.

CHAIRMAN ZIEMER: Who has the lead for ORAU? Does Matt Smith or --

DR. NETON: Let's see who is on that. Who is the lead person on the ORAU, if on the call? Or is there one?

MR. SHARFI: I could probably answer your question, Jim.

DR. NETON: Yes, Mutty.

MR. SHARFI: Yes, this is Mutty Sharfi.

The main reason why we made a

statement that we may need to do additional data capture would be depending on the level of detail that you get in. It is not to say we don't have a lot of documents that could add to the history of the site. But, depending on what level of detail, you may need to get additional information on specific operations. At that point, we may need to do additional data captures. But it is not a guarantee that we need to do that.

DR. NETON: Yes, I would suspect that you could do a pretty good job describing, putting together a description without an additional site visit.

CHAIRMAN ZIEMER: Well, it will be your call. You will decide whether you need more information. Okay. I think that is good then.

So, the ball is in NIOSH's court on that one, right?

SC&A, any further comments on that?

MR. FITZGERALD: No, no. Again, I think that was the only observation on that one.

CHAIRMAN ZIEMER: Okay.

MEMBER RICHARDSON: This is David Richardson.

I'm glad that you raised the point. As somebody who comes in with less familiarity about this site, I found it really hard to orient myself to, I mean, as you are saying, kind of an assessment of the monitoring program, given kind of a one-sentence summary of what the kind of major activities were, that they were astrophysics, nuclear fusion, earth sciences, genomics, health physics, computer science.

Kind of in terms of the operations that were going on there, that is basically what, and then there is a table describing the buildings, which I guess is an attempt to summarize kind of the facility. But that, also, as kind of another dimension of a matrix

that you might describe the site history by, isn't giving me, didn't give me enough of a sense of kind of the relative importance of these in terms of kind of radiological hazards.

And I found the tables a little confusing. I wasn't sure how they were organized. So, I think some text to kind of describe how exhaustive this structure, as it is provided, in terms of building, how those correspond to facilities and processes where you think the monitoring should occur, and then, why so many of the -- like the second, Table 2-2, the first set of rows have some values which are sort of described as the quantities that workers could have encountered by area, which I was a little bit curious about what that meant.

And then, the vast majority of them are just you've got lots and lots and lots of ones where there is no sense of the scale of activity whatsoever, which means

that, again, I was wondering, well, I still, again, walking in as kind of a very naive reader, the idea that there's lots and lots of rooms where there may have been radionuclides and there's no idea of the magnitude of those exposures, I was left kind of bewildered by what actually happened there, "there" being pretty much the facility and how to make a judgment about the monitoring program at all.

CHAIRMAN ZIEMER: Yes, I think that is a good point, David, because, with these tables, you can't really correlate it with specific programs. You can't always tell whether it is just like a small counting lab where they might have brought in trace samples versus some wet chemical operations, or whatever.

Anyway, yes, that's helpful to see that. I think that would be an issue for the Board at large as well, particularly people who have not had any familiarity with that facility.

So, okay, I think we have enough to go on to agree that we will need to flesh that out under Issue 1.

Let's go on to Issue 2, then, Joe.

MR. FITZGERALD: Yes, Issue 2 was sort of the fundamental finding that the internal dose information for Berkeley was inadequate, and particularly before 1961. So, again, remembering this finding was made before the SEC, obviously the SEC comports with sort of what we saw when we looked at the bioassay information.

As Lara pointed out, it is pretty clear that 1961 was a threshold year in a way for Berkeley. So, we came up with the same finding.

One thing that we are going to be going through -- and you will see this finding elsewhere as we go along -- is we have some concerns, and these are, more or less, traditional concerns that we have and have had at other sites on the adequacy and

completeness of the data itself. This is the bioassay data.

And even though it is most prominent before 1961, it is pretty clear that is when Berkeley really started managing an internal bioassay program. We have some concerns that continue on which are relevant to this issue on the Site Profile.

In terms of adequacy -- and this is Issue 2 that you're looking at -- we have some concerns over MDAs and the threshold of Berkeley's ability to see some of the nuclides that were being handled. Now that gets into the issue of exposure potential. I don't have to tell this group that that issue is always very pertinent. Just because the particular radionuclides existed at Berkeley and they practically had the entire periodic table doesn't mean that there was an exposure potential for internal uptake for the workers involved.

However, I think that is kind of

the crux of what we would be looking at in more detail, would be, one, whether there's adequate means of monitoring for the nuclides, that there was, in fact, exposure potential from 1961 forward.

Dr. Ziemer, your comment about prior to 1961, I think there is some question in my mind as to whether we need to have some sense of that as well if you are doing partials.

But that's the question: what's the exposure potential for the nuclides at Berkeley? And for those that one could ascertain some exposure potential, was there an adequate means of monitoring at that point in time for those nuclides, such that you would have a sufficiently-accurate dose estimate? And is the data complete enough?

In other words, were there any gaps after 1961? I think you commented at 1961 to 1962 there is some ramp-up period. Is the bioassay data complete for that period,

for example, such that you could do dose reconstruction? So, I think those are kind of the questions.

The Site Profile review isn't equipped to really start probing the actual data itself. The Site Profile review is: we look at the dosimetry procedures in place, MDAs, and things like that, and try to get some sense of the adequacy. But, really, what we are talking about here is whether the bioassay database, whether it was complete enough for the years after 1961 and whether the dosimetry techniques were adequate in terms of MDA and other means at the same time.

Now this one here, we are focusing on adequacy, and the MDA I think is the key question that is brought up. I think NIOSH's response is that, if the MDA information is not as complete as necessary, it can be obtained from the claimant's submission. And at the same time, if there is additional information required, if I am reading this

right, Lara, Table 5.4, which is where that information is provided, can be supplemented by more data capture.

So, I think there is some question whether we have a complete set of information on MDAs or at least some question on the issue of exposure potential and the ability to monitor for the nuclides of relevance at Berkeley. So, I would say that is kind of the issue in Issue 2.

CHAIRMAN ZIEMER: Well, it appears to me that NIOSH is saying that they believe that what they have here is adequate for individual dose reconstructions or for bounding, if I'm understanding that.

I suspect what we need now is a more detailed response from SC&A on this, Joe, would you think?

MR. FITZGERALD: Yes.

CHAIRMAN ZIEMER: I mean, you've sort of said it here in words, but I think we need that spelled out. What is it that needs

to be done yet?

MR. FITZGERALD: I think specifically I would like to, you know, I think NIOSH indicates that they have been able to identify specific MDA information in the workers' dosimetry records. I think that would be useful to sample those records just to see, because that is one source of information we have not looked at, which was the dosimeter information in the records themselves.

That, in addition to maybe probing the question of exposure potential a little bit more than we had, which is you do have this universe of nuclides, but in terms of what was actually relevant for exposure, it is a much smaller subset.

I think going further to establish with NIOSH what does matter at Berkeley in terms of being able to monitor and cut it down to that point, so that we are not talking about that large universe; we are talking

about what matters. And then, are we comfortable from the Work Group's standpoint that the monitoring that was done was adequate for those exposure pathways? That is essentially it.

So, for the Work Group specifically, which nuclides would be relevant to this question of adequate monitoring and also being able to look at what additional MDA information that would inform the dose reconstructor, which I don't think we had available to us when we did the original review.

CHAIRMAN ZIEMER: Right.

MR. FITZGERALD: And apparently, there is more information that can be had. So, it is an SC&A action, but I think we would need to come back --

CHAIRMAN ZIEMER: Yes, you would have to work with NIOSH to get that.

MR. FITZGERALD: Right.

CHAIRMAN ZIEMER: But the action

would be in SC&A's court at this point to probe that.

MR. FITZGERALD: Right.

CHAIRMAN ZIEMER: So, you would be looking at what the MDAs are in the records?

MR. FITZGERALD: Right, and I think we would want to work with NIOSH to --

CHAIRMAN ZIEMER: Some sample?

MR. FITZGERALD: Because, clearly, there is more information than we alluded to in the original Site Profile review.

But the other part of that I think is to identify the nuclides that, based on the information that we have, would be of that large set of nuclides that were handled historically. This is after 1961. Which one of those would be relevant to this discussion in the first place?

CHAIRMAN ZIEMER: Right.

MR. FITZGERALD: Sort of cut it down, so we are not talking about others that are not. So, that would be something I would

prepare.

CHAIRMAN ZIEMER: Right. Is there any reason this couldn't get underway without Issue 1 being handled?

MR. FITZGERALD: Oh, no, I think --

CHAIRMAN ZIEMER: In other words, you could get into these records and do that critiquing without --

MR. FITZGERALD: Yes. Yes, what I would say is it is not going to be a large list, but I think just to figure out, beyond bench scale, beyond trace, beyond checked sources, what were the operational pathways that one would want to establish a monitoring record for?

If the records don't exist, then I think that would be a reasonable source of inquiry as to why they don't they exist. It may turn out the form of the particular nuclide was such that it would not have presented an exposure pathway. That is

something I think would be useful to figure out.

CHAIRMAN ZIEMER: Okay. I'm trying to get a feel for, is that something that NIOSH has to identify first for you guys to probe?

MR. FITZGERALD: Either way. I mean, as part of Issue No. 1, I suppose you could come up with what would be NIOSH's list.

CHAIRMAN ZIEMER: Well, that is sort of why I'm asking.

MR. FITZGERALD: Yes.

CHAIRMAN ZIEMER: Is this dependent on --

MR. FITZGERALD: Chicken-egg, yes.

CHAIRMAN ZIEMER: -- doing No. 1 first? Or can they occur --

MR. FITZGERALD: I will defer to NIOSH. I mean, it certainly could be done in conjunction. We could do it just from the operational records as well, but it would be done separately.

DR. NETON: Yes, I think it could be done separately. I don't see --

MR. FITZGERALD: Either way.

DR. NETON: Yes, I don't know that it would have to wait for us to flesh-out the operational history.

CHAIRMAN ZIEMER: Okay. Can you proceed on it?

MR. FITZGERALD: Yes.

CHAIRMAN ZIEMER: And you can ask the questions then?

MR. FITZGERALD: Right. I mean, it is simply saying here's what seems to be the relevant nuclides that were handled after 1961 that appear to have exposure potential.

CHAIRMAN ZIEMER: Got you.

MR. FITZGERALD: And I would certainly provide that, and the Work Group and NIOSH can respond as to whether there are any questions or issues. But rather than get into a broad discussion on MDAs and --

CHAIRMAN ZIEMER: Right, right.

MR. FITZGERALD: -- monitoring, I would like to think we could down-scope this thing, so that we can have a much smaller set to deal with. So, maybe that would be a going-in thing to do on this one.

MR. KATZ: And it seems to me you could even have some exchanges by email, memo, whatever --

MR. FITZGERALD: Yes.

MR. KATZ: -- to sort of push this along to gear SC&A, so that it has the right focus when it digs deeper and to have a solid understanding --

MR. FITZGERALD: Yes, yes. I want to avoid spending a lot of time trying to figure out completeness and adequacy of data when, in fact, there is not agreement that there was an exposure potential.

MR. KATZ: Yes. Got you. Right.

MR. FITZGERALD: I think we have learned that.

CHAIRMAN ZIEMER: Right, right,

right.

MR. FITZGERALD: Okay.

CHAIRMAN ZIEMER: Let me ask David if he has any additional comments or questions on this item.

MEMBER RICHARDSON: Yes, there's two things. One is this issue started off with sort of making a division between earlier and late periods based on what is covered by an SEC. I think the latter part of the discussion has focused on the period kind of 1962 forward. Is that the cut point, the boundary point?

DR. NETON: Yes.

MEMBER RICHARDSON: But there was some suggestion early on of also needing to kind of figure out kind of what is done with the earlier period. I wanted to suggest that we maybe not focus too much energy on that question. If my understanding is correct, NIOSH has said that they can't reconstruct doses for internal deposition in that earlier

period. And so, this is not an issue.

If that is the basis for the SEC, then they are not going to be put in that position. Is that --

DR. NETON: I agree. I think the idea was for the earlier years, if there were external exposures, that sort of thing, which we might get into a little later. But you're right, if the basis was that we can't reconstruct internal exposures, there is really not much point in evaluating what we could do there because we already said we can't.

MEMBER RICHARDSON: Okay. The only other comment I had was I do think it would be useful to kind of figure out, as you suggested, trying to figure out what were the potential intakes.

There is a little bit of circularity in the table that is at the end of Section 5. It is a long table listing buildings and radionuclides. So, I guess it

is Table 5.7, Radionuclides by Facility.

Because sort of the basis for the list, which is maybe a good starting point, but I just hope it is not the ending point, is what has been bioassayed for and, then, also, some contention that -- I don't know -- Patterson, Low-Beer, and Sargent had identified that as potential exposures and concluded that normal habits would ensure that typical workers did not receive exposures of any consequence from these sources.

But I think it would be useful for me to have kind of a skeptical read of that and see whether there are kind of atypical exposure scenarios of concern, just so that that list isn't based on what we look for we know we see.

The other thing -- and this kind of overlaps with the first point about understanding a little bit more about the history -- is I guess I am still having a hard time understanding what happened where/when,

and the time dimension seems to be sort of lacking. Like when you've got a row that says in this building carbon-14 and tritium were used, well, kind of my impression of kind of the dynamic changing mission of a laboratory like this is that by the 1960s maybe there was very little work going on with some of these and there was a lot of work going on with other of these radionuclides.

And so, if the table could somehow reflect the period that we are primarily interested in, that might help to simplify things as well.

CHAIRMAN ZIEMER: I think that is a good point, David. To some extent, that might come out when we get Item 1 fleshed-out because the time period, presumably, well, if you look on that table, for example, for the Donner Lab, it is 1961 to present. So, you've got a 60-year, well, let's see, 60, yes, 50-year time period. You don't know whether these are used all during that or whatever.

So, I think the point is well-taken.

I guess we will understand that, and Joe is making a note here, too. You understand his point there?

MR. FITZGERALD: Yes, and I think that is kind of where we are coming from, too. Looking at post-1961, what's --

CHAIRMAN ZIEMER: What's pertinent?

MR. FITZGERALD: -- what's pertinent for the question we are asking and making sure that we are asking the right questions in terms of the operational changes that are going on.

And it was a very dynamic situation. All these energy research labs were very dynamic. Things came; things went; things didn't last very long, and just making sure that they are captured.

CHAIRMAN ZIEMER: Okay.

DR. MAURO: This is John. I have a process question.

While we are probing Issue 2 related to post-1961 MDAs, bioassay data, et cetera, data adequacy, NIOSH, of course, will be probing Issue 1. So, they will be moving in parallel.

And I see a link between the two, in that when we identify, let's say, as Joe and his team identify areas that might be soft post-1962 in internal dosimetry, for example, would it be appropriate -- in theory, within a matter of some time period we will issue a White Paper or some kind of report related to Issue 2. And then, from there, of course, those matters will be discussed.

But since there is linkage between Issue 2 and what NIOSH will be doing on Issue 1, would it be inappropriate for SC&A, for there to be an exchange as the two organizations move down this path?

MR. KATZ: That's what I was saying, John, about exchanging memos, what have you, calls, memos, because these are

linked and because you may not know everything that DCAS knows as to what their holdings are, and vice versa, about your concerns. So, I think it is appropriate for you to exchange memos. If you need to get on the phone because things are complex, that's fine, too. I like memos just because it is nice to have that paper record back and forth. But absolutely.

That could all lead up to your producing an actual White Paper as opposed to having to produce a White Paper with a whole bunch of questions in your mind. That doesn't make much sense.

CHAIRMAN ZIEMER: So, Joe would certainly be free to make contact with NIOSH if a question arose, and vice versa.

MR. KATZ: Right.

CHAIRMAN ZIEMER: So, we are okay, then, on that one?

MR. KATZ: Yes.

CHAIRMAN ZIEMER: David, you're

okay on that?

MEMBER RICHARDSON: Yes, that's great.

CHAIRMAN ZIEMER: Okay. Let's proceed to Issue 3, which is called "special forms of tritium and plutonium not addressed by NIOSH."

MR. FITZGERALD: Yes, I mean, in this particular one, we raise a question we have raised in other reviews where we are talking organically-bound tritium, tritides, and also some of, well, in this case Super S form of plutonium, high-fired plutonium.

And I think this was a function of the Rev 1 TBD, being an older TBD, it didn't include some of these subjects that obviously have gotten a lot of attention over the last several years. And so, we did make that comment. Of course, Rev 2 came out right afterwards that did, in fact, address OBTs and tritides and Super S, but they were added in.

Now we haven't gone through and

actually performed a technical evaluation, but we are fairly confident that some of the questions that we typically have on those areas at least are certainly addressed in the revision. And I think this is pretty much what NIOSH says in their response, is that they, in fact, did address some of these.

Now I believe the only question or difference here was in the SC&A review of 2010 we posited some questions about high-fired uranium and even possible thorium, some of the actinides. This came out in interviews with some of the Berkeley workers that have raised some questions in that area. I think NIOSH's response is there is no evidence that there's any of that behavior associated with the uranium or thorium.

So, that is the only difference I think we have on this, even though we have not gone through and spent some time validating what was in the second revision on the high-fired and the tritides and everything. But,

again, we pretty much have worked this issue for a few years, so I am pretty confident we will be okay.

So, the only question is uranium and thorium in high-fired forms. I have not gone any further than just acknowledging that that was the response.

CHAIRMAN ZIEMER: Joe, does SC&A want to follow up on that point in any way? I think you are raising that as sort of a theoretical question: can there be Super S uranium and thorium? Is that what you are asking?

MR. FITZGERALD: We are raising it because it was brought to our attention in the interviews that we had. And those interviews are available to NIOSH. So, again, we are just sort of raising that. This is the very first response we have gotten on the subject in this matrix.

DR. NETON: We have seen comments before at other sites of the existence of

high-fired soluble uranium, in particular. We have just never seen any evidence of its existence. It has been mentioned, but the biological behavior doesn't seem to support it.

I mean, we would be happy to look at any studies put out, but --

MR. FITZGERALD: We, likewise, haven't researched the subject. It comes up, and I agree with Jim, it has come up at several sites. So, it sort of makes you wonder. It seems like there is some historic reference to that, but, again, we haven't been able to pin it down.

It came up first, I think, at Y-12 in terms of high-fired uranium. That's -- what? -- five years ago, and we still haven't seen anything hard in the literature to support it. But it keeps coming up.

MS. BRACKETT: This is Elizabeth Brackett. I would like to comment on the high-fired uranium.

CHAIRMAN ZIEMER: Yes, Liz, please do.

MS. BRACKETT: Well, a lot of the information I came up previously with discusses being held longer in the lungs. It is based on ICRP-30 models. Now ICRP-66 lung model has a broader scope, and Type S encompasses more material than Class Y did.

And so, our response has been, while Class Y might not have addressed the longer retention time of a high-fired uranium, Type S does. It was modeled such that it would incorporate that. And so, that is why we haven't seen any evidence that it goes beyond Type S material or -- yes, Type S material.

CHAIRMAN ZIEMER: Yes, that is a point that probably should be added to the NIOSH response here. I guess the only thing, I would ask SC&A if you would just take that into consideration; just add that here now. And just as a followup, next time around just

tell us whether you are in agreement with that or not or if you still see an issue.

MR. FITZGERALD: Yes. That was 30 versus 60?

CHAIRMAN ZIEMER: Sixty-six is the new lung model.

MS. BRACKETT: Right.

CHAIRMAN ZIEMER: Or the newest one. Sometimes the new ones get to be pretty old fast.

So, you are going to follow up --

MR. FITZGERALD: Okay.

CHAIRMAN ZIEMER: On ICRP Report 66, a lung model for those and see if that satisfies --

MR. FITZGERALD: Yes, I would ask NIOSH or ORAU if they could just provide a capsule, just like sort of you did here, a capsule. I think I got most of it, but just to get that specific point down in writing, that would be helpful.

DR. NETON: Yes, that's a very

good point.

CHAIRMAN ZIEMER: So, I'm going to make a note here that NIOSH is going to add to the response the comments that Liz Brackett made or the equivalent.

MR. FITZGERALD: And we would just simply come back and validate whether that satisfies --

CHAIRMAN ZIEMER: Yes, whether you have any concerns or not beyond that. Because it looks like, otherwise, you were okay, and that was just sort of --

MR. FITZGERALD: Yes.

CHAIRMAN ZIEMER: -- left hanging there. Or, if there is any other evidence that anybody knows about? It sounds like, as I'm hearing it, that the new lung model is sufficiently inclusive that it would cover --

DR. NETON: That's what we believe.

CHAIRMAN ZIEMER: Yes.

MR. FITZGERALD: Yes, I want to

reserve --

CHAIRMAN ZIEMER: Yes.

MR. FITZGERALD: We want to take --

CHAIRMAN ZIEMER: Take a look at that.

MR. FITZGERALD: -- a look at OBTs, tritides, and Super S. Like I say, I am pretty confident that tracks with where we have come out in the past, and that won't take long, but we didn't actually do a technical review. We just kind of scanned it and it looked like it was pretty complete. So, you're right, this is one difference that would need some validation.

CHAIRMAN ZIEMER: Okay. Let me ask Dr. Richardson if he has questions or comments on this one.

MEMBER RICHARDSON: No, I don't.

CHAIRMAN ZIEMER: Okay. Let's go on to Issue 4. This is external and internal data legacy completeness and accuracy.

MR. FITZGERALD: Yes, I think this is a broader look at the completeness and accuracy of the records system, the legacy records system, and whether or not that was addressed.

I think there is a reference in the original Site Profile, I think actually in one of the responses that was provided in the matrix, where it says early on that -- oh, in fact, it's this one. The NIOSH response says that "NIOSH does not use bioassay databases to reconstruct internal doses from all the workers. NIOSH uses individual dosimetry records provided by the DOE."

In the past, we have said, okay, but there is a need to just make sure that the records that DOE does give you are complete in the first place. I think the essence of this particular finding is establishing that you are dealing with a complete enough set; you are not missing periods of time.

I think in the review we found

some questions as to whether bioassay submittals were delinquent by quite a long time period, up to a year, what significance that might have for the shorter-lived nuclides; also, questions of bioassay frequency and the inclusion of facilities like the Donner Laboratory and whatnot. So, questions of completeness and questions of whether or not the completeness of what DOE has provided has been looked at at all.

CHAIRMAN ZIEMER: Okay. Well, part of the NIOSH response here is getting some additional records, I guess, on Donner Lab, is part of it, right?

DR. HUGHES: Well, we haven't really seen this from when we evaluated. I haven't gone back in a while, but we haven't seen a specific lack for a certain building in any of the records, as far as I am aware of, but we haven't specifically looked at that information, either.

CHAIRMAN ZIEMER: Well, I am

trying to get a feel for what has to be done here.

DR. HUGHES: Yes. I do believe this thing about the Donner Laboratory came out of an interview?

MR. FITZGERALD: Yes, it is a site interview.

DR. HUGHES: If we could have that --

MR. FITZGERALD: We have the summary.

DR. HUGHES: Yes.

MR. FITZGERALD: I think the original ones are available, yes.

DR. HUGHES: Yes, just to give us some specifics, you know, what might have been going on there, because we have done an extensive research for the SEC, which is now a few years back. So, I don't remember specifically, but I do not remember seeing anything to that effect, unless it was maybe correlated to the activities going on. But,

as I said, we would have to go back and look at it.

MR. FITZGERALD: Yes, a major source was the interviews, former workers that were familiar with the activities at Donner and their expression that they were not bioassayed and they should have been, that type of issue.

CHAIRMAN ZIEMER: Joe, from SC&A's point of view, were you looking for evidence that the bioassay database is actually complete?

MR. FITZGERALD: Yes, I think this is the question, complete from a standpoint of the operations that were under the Berkeley umbrella, for one thing, and then in terms of timeframe, whether particularly in the earlier part of that, the 1960s, whether or not you are dealing with a database.

CHAIRMAN ZIEMER: Yes. But it is sort of like, is NIOSH saying, "Well, why do you think it's incomplete?" And you're

saying, "Show us that it is complete." What do we need here? Is it a matter of establishing that there are appropriate bioassays for these activities in these time periods? What is missing or what needs to be looked at to confirm completeness of records?

MR. FITZGERALD: I think, again, we went and looked at the bioassay work. We did onsite visits at Berkeley --

CHAIRMAN ZIEMER: Right, right.

MR. FITZGERALD: -- talked to the dosimetry staff, looked at the records that were available. And not all the records are there. Now in the early years that would be expected. You are not going to have a staff function at 100 percent.

CHAIRMAN ZIEMER: Right.

MR. FITZGERALD: But the question would be, are the records not just simply what DOE provides, but are the bioassay records behind what DOE provides complete enough that you could, in fact, do dose reconstruction or

not with sufficient accuracy?

And the question of the Donner Lab is whether or not certain facilities that had radiological source-terms -- and this gets back to kind of the question on the previous finding, Finding 2 -- whether the locations where you had exposure potentials, whether, in fact, you had monitoring. And this is sort of tied to that.

In interviewing workers that had knowledge of the Donner Laboratory -- and I think there was one other facility. Oh, these are satellite facilities that were under Berkeley, whether they, in fact, were covered adequately, particularly in the early sixties as compared with the main campus. I think there was some question, based on those interviews, whether that was the case or not. But they may have come along slower than the main operational areas.

To answer your question, I think it is just a matter of taking a look at the

database and establishing that you have what you need for the years in question. It is really much what has been done at other sites. Is it a complete enough database? Are there years missing or facilities missing?

You know, if you have the facilities and you have sufficient -- you are going to miss, for an individual, you are going to miss perhaps some weeks or some months, or whatever. But if you are missing everybody for a year or missing a particular operation for a year, then I think it is more of a significant issue.

DR. MAURO: Joe, this is John.

Would you say that, at least for internal exposure post-`61 --

MR. FITZGERALD: Right.

DR. MAURO: -- that this Issue 4 is really very much part and parcel of Issue 2? In other words, is it possible that these two are really one issue?

MR. FITZGERALD: Well, I think

Issue 1 is more internal. This is really a question of data completeness.

CHAIRMAN ZIEMER: This is external and internal.

MR. FITZGERALD: This is internal and external.

DR. MAURO: I agree. That is why I raised the question. With respect to specifically internal, I see a bit of overlap, if not quite a bit of overlap, between Issue 4 and Issue 2, unless I am not reading this correctly.

MR. FITZGERALD: Yes, I think Issue 2 speaks probably more strongly to adequacy. In other words, do you have the monitoring techniques that marry up to exposure potential for internal?

CHAIRMAN ZIEMER: Versus completeness.

MR. FITZGERALD: Issue 4 is, more or less, yes, you can think of it as completeness. Do you have the facilities

covered? Do you have the years covered in a way that enables you to use the dose records without concern over integrity, not really integrity, but, you know, completeness?

DR. MAURO: Okay.

MR. FITZGERALD: And this is kind of a little conventional. I think we ask this question, or the Board asks this question at most sites, as to, yes, you get the data from DOE, but what gives you confidence that it is complete and adequate? And someone looked at the database to come to that judgment.

I think, again, because you are not really worried about it until probably after `61, it is not as hard a question, but it still a question that would be relevant to ask: you know, are you confident that what you are getting from DOE is complete?

DR. NETON: I can understand that.

CHAIRMAN ZIEMER: What has to happen, though?

MR. FITZGERALD: Well, I think

NIOSH, you know, you have access to the database that is behind the DOE records. Now we looked at those records, at that database, when we went to Berkeley. It is there. It can be looked at. We didn't spend a lot of time, obviously.

DR. NETON: We don't have that database, do we?

DR. HUGHES: I don't know. We have scans of the bioassay records. I'm not sure.

DR. NETON: I think, like other sites, what we are looking at here is some type of validation of the data that we are using. In some situations, we will go back -- like I think now at Paducah we are going back and pulling reports that exist that say we took this many samples in this month on this many workers, and just validating or verifying that we, indeed, have those numbers of samples, that kind of thing.

CHAIRMAN ZIEMER: Right.

DR. NETON: So, some sort of a data completeness validation.

CHAIRMAN ZIEMER: Right.

DR. NETON: I think, consistent with what we have done at other sites, that should be done here. I agree.

CHAIRMAN ZIEMER: Currently, the NIOSH response seems to be that, if you get a claim, you go to the record. If you don't have it, then you have to figure out what to do.

Joe is asking the more universal question, what if that is true for X number of people for a year, that the records are missing or something?

DR. NETON: Well, or how do we know that DOE is providing us all the records that were there?

CHAIRMAN ZIEMER: Yes, all the records, right, right.

But you have some sort of standard approaches you would use to answer this

question.

DR. NETON: There are several ways to get at this issue, yes. If they have an electronic database, that is a start. Certainly, if there are records in the electronic database for a modern worker that the DOE is not providing us, that would raise some flags.

CHAIRMAN ZIEMER: Right.

DR. NETON: If the records were missing from the database that the DOE provided, it would not necessarily be a showstopper.

CHAIRMAN ZIEMER: Okay.

DR. NETON: I mean, the database could be incomplete.

CHAIRMAN ZIEMER: So, I guess although we have the NIOSH response here, it appears to me that there is an additional followup --

DR. NETON: I agree, yes.

CHAIRMAN ZIEMER: -- that NIOSH

would develop a -- I don't know if it is a White Paper, but a report to demonstrate completeness of records. And then, SC&A would have an opportunity to say, "Yes, that addresses our concern."

MR. FITZGERALD: Right. Now to go back to John's comment, the coupling between this or the completeness issue and the adequacy issue in Issue 2, I think you are stepping back and deciding, okay, `61 is a threshold that was acknowledged in the SEC Class because Berkeley started managing its own bioassay program, and there is certainly documentation to that effect.

CHAIRMAN ZIEMER: Right.

MR. FITZGERALD: This validates that the actual data from an adequacy and completeness standpoint comports with the `61. I think the formal program and the establishment of that program speaks to a threshold in `61. This kind of validates that things didn't kind of struggle along --

CHAIRMAN ZIEMER: Right.

MR. FITZGERALD: -- for a while.

CHAIRMAN ZIEMER: That's part of this, although this issue also speaks to external records, and partial dose reconstruction still may have to be done for the early years for external.

DR. NETON: Right.

CHAIRMAN ZIEMER: So, I think we could still ask the question for the early years or, I mean, you can just ask it all at once, I guess, in a sense, right? I guess, but I don't know.

DR. NETON: Yes, we'll have to think about that.

CHAIRMAN ZIEMER: Yes, think about that. No. 1, you are not going to get that many claims for the early years. You're going to get a few non-covered cancers and you might get a few less than 250 days.

DR. NETON: We will work with the data that are there. I mean, if there seems

to be gaps in the data, they are what they are, right?

CHAIRMAN ZIEMER: Yes.

DR. NETON: We will do the best job that we can to reconstruct the partial doses.

CHAIRMAN ZIEMER: Right.

DR. NETON: There is no other option there other than making it an SEC, which it already is.

CHAIRMAN ZIEMER: Well, we know that for the internal. I am talking about external. I mean, if there is a data gap simply because DOE has not provided all the records for the early years and they exist, that's --

DR. NETON: Oh, that is a different story, yes. Yes.

CHAIRMAN ZIEMER: Yes. So, I think you can still ask that question.

DR. NETON: Oh, yes, we will go back and look at it.

CHAIRMAN ZIEMER: Okay. So, that would be the followup on this one.

Again, I will ask Dr. Richardson if he has questions or comments on this particular one.

MEMBER RICHARDSON: Yes, I have a few.

CHAIRMAN ZIEMER: Good. Go ahead.

MEMBER RICHARDSON: So, one issue that I was thinking about gets at what you were just touching on of the external dosimetry information for the period prior to `61 or `61 and before.

There is description in table 5.3 of the monitoring and storage of in vivo monitoring in terms of periods and, I believe, how this data are stored. There is no description at all of what I think this issue is talking about for external dosimetry. Like what is the data legacy?

I mean, kind of the response that NIOSH uses dosimetry records provided by DOE

is correct, and, yet, I believe, like what Table 5.3 is saying is, well, what DOE can provide is what the site stored on magnetic tapes or 8-inch disks in the 1980s and in printouts alphabetically stored in other periods.

That is the type of information. I mean, the fact that they provide it to you doesn't kind of describe, well, how was it archived? And particularly for the early external dosimetry data, I think that might be useful to describe.

Is everything available in terms of kind of hard-copy dosimetry cards? I mean, some facilities I know all you've got is quarterly green bar computer printouts. At least I have never been able to find something better than that.

And so, kind of to get a sense of the completeness, one way that I have seen it described before is sort of on a claimant basis and on a work-year basis, what

proportion of the claimants have information that is available? Even that sort of information would be useful.

So, right now, there is a sentence that says, "Personal dosimetry records are generally available for all periods for workers who had potential for occupational radiation exposure." I mean, fleshing that out a little bit more would be useful in a sense of, what does it mean that are generally available and how has that changed over time?

CHAIRMAN ZIEMER: For the external particularly because this is just internal on this table.

MEMBER RICHARDSON: Right, for that, yes, the dosimetry records. Yes, I am referring to the start of Section 611, where there is a single sentence right now that is sort of giving us a reassurance about the completeness of the records that can be provided by DOE, but in a very vague sense.

The figures in this section, now I

have the benefit of having a mirror in my room, in my office here. So, I figure 6.1 I can hold up to a mirror and read and Figure 6.3, but I believe they are mirror images of what would be useful to have. Everything is upside-down and backwards, which made it really hard to interpret.

CHAIRMAN ZIEMER: Where are you?

DR. NETON: Oh, yes, yes. Yes, you're right.

MEMBER RICHARDSON: Figure 6.1 and Figure 6.3.

DR. NETON: Absolutely. They are upside-down and backwards. I wonder how that happened. I've never seen that before.

(Laughter.)

MEMBER RICHARDSON: Yes, I don't know how that happened, either, but it required some creativity.

DR. NETON: Yes, I don't know how one could cut and paste something like that.

CHAIRMAN ZIEMER: It was a

transparency that was probably put in reverse.

MR. KATZ: Yes, "Leonardo graphics."

MEMBER RICHARDSON: That's right.

CHAIRMAN ZIEMER: We need to have three here, don't we?

(Laughter.)

Did SC&A pick that up in their review?

MEMBER RICHARDSON: Apparently, nobody has looked at the figures except --

MR. KATZ: Except you.

(Laughter.)

CHAIRMAN ZIEMER: Yes, okay, thanks. Go ahead, David.

MEMBER RICHARDSON: This is, again, kind of a gestalt kind of impression of reading the report. There are 10 or 11 pages given to the assessment of the medical doses, and there are 10 pages given to the occupational exposures and the dosimetry program.

Again, when I read this in sort in a description of what went on at the site, right now, kind of the weight, kind of the balance of attention in this Site Profile kind of document led me to think that, well, perhaps the medical exposures from kind of routine screening are on par with the occupational exposures. And so, I don't know what that means except that I think that there was a lot of enthusiasm or a lot of information available for providing a lot of detailed information in this document about the chest x-rays. But I was hoping there would be more information maybe partly along these lines.

Maybe I'm wrong. Maybe they are of equal kind of magnitude. And therefore, that is what the balance is trying to communicate. That was just something striking to me.

CHAIRMAN ZIEMER: Well, it is an interesting point. I think you are probably

quite right, it is much easier to elaborate on the medical. We certainly know how to do that pretty well.

MEMBER RICHARDSON: Yes, but it is sort of a balance that I have not seen in other --

CHAIRMAN ZIEMER: Yes. Yes, I think it is a good point, David. Okay.

DR. MAURO: Paul, this is John.

CHAIRMAN ZIEMER: Yes?

DR. MAURO: Before we leave, when you are probing completeness under Issue 4, whoever is probing it, typically, you do find -- let's say we are talking external -- that there are always some holes for time periods, buildings, job categories, or whatever.

So, the other side of the coin is, once you do identify there might be some completeness issues with external, then it leads you to the question of a coworker model. I have to admit I haven't been following this so closely, but is there a coworker model for

external dosimetry when you do have incomplete data in this TBD?

DR. HUGHES: There's currently no coworker model for this site.

CHAIRMAN ZIEMER: No, none currently.

DR. MAURO: Okay.

CHAIRMAN ZIEMER: And I guess probably, unless NIOSH identifies in this process that it is needed, there probably won't be, right?

DR. MAURO: Okay.

CHAIRMAN ZIEMER: At some point, if there's a gap that is striking, I suppose that would be the next step, but there is none at the moment.

MEMBER RICHARDSON: I have a question that also touches on completeness, and this is a sort of general issue. When we visited the contractor and saw how they were keying-in the data, it appeared that they were keying-in kind of what were PDF versions of

hard-copy records for dosimetry information, and they had all of the detailed kind of handwritten dose results.

Is that the search that DOE does, to try and locate those hard-copy records? Or, in the absence of those, do they look to electronic databases?

DR. NETON: Well, I think they look through any available information that they might have. It is not really the DOE that does this. It is actually the site itself, I mean, that provides the records.

So, there is usually a person at the site who is the point of contact that is familiar with where the information may be, and it is their job to assemble all the information that they have in their possession and provide it. I mean, we do request it through the DOE, but the site really is the one that assembles the information.

MEMBER RICHARDSON: Okay. We have had experiences where one or the other is

available but not both.

DR. NETON: Yes, and we have gotten both, I mean in various forms. At Savannah River, we get computer printouts with redacted names on them because that is the only place it exists. Some sites actually provide data electronically. I think the Nevada Test Site was good with that. They would provide us with electronic records. Some sites we have actually went and got the whole database. So, yes, it depends.

MEMBER RICHARDSON: Okay.

CHAIRMAN ZIEMER: Okay. We will take a 10-minute break now and then proceed from there. How's that?

(Whereupon, the foregoing matter went off the record at 10:33 a.m. and went back on the record at 10:43 a.m.)

MR. KATZ: Okay, we're back.

Let's just check and see, Dr. Richardson, do we have you?

MEMBER RICHARDSON: Yes, I am

here.

MR. KATZ: Great.

CHAIRMAN ZIEMER: Okay. We are ready to proceed with Issue 5.

DR. BUCHANAN: This is Ron Buchanan. Can I ask --

CHAIRMAN ZIEMER: Ron, sure, go ahead. Ron Buchanan.

DR. BUCHANAN: Okay. I have to leave here in about 20 minutes. So, I wanted to be sure and ask this question.

We are running into the question, an SEC covers a certain period, say like bioassay data. Do the Site Profile issues, say with external data, still stand for that SEC period? What is the ruling on that?

CHAIRMAN ZIEMER: Well, I think the answer is yes because there are cases where you have to reconstruct dose for non-eligible cancers as well as people who were there less than 250 days. And dose may have to be, partial dose reconstructions, certainly

for the external, NIOSH says they can do that. they might even do partials for the internal if there is specific bioassay data, I guess.

MR. KATZ: But I thought the SEC for part of that early period had raised issues even about external data up until `48 maybe. There were provisos about external data being sparser, inadequate as well.

DR. NETON: In the SEC report?

MR. KATZ: In the SEC report, yes.

DR. BUCHANAN: Yes, it is that `48 and onward that was available --

MR. KATZ: Right, right. Okay, so that's it. That's what I remembered.

DR. BUCHANAN: Okay. I just wanted to make sure because it makes a big difference on how much time we spend on these Site Profile issues if the SEC negates everything or just the bioassay data. And it is important --

DR. NETON: No, no, the SEC does not negate everything. And even if we have

provisos on the external, we still have to figure out the best path forward to use the data that we have.

MR. KATZ: Right.

DR. NETON: I mean, they are what they are.

CHAIRMAN ZIEMER: Does that answer your question, Ron?

DR. BUCHANAN: Yes, it does. Thank you.

CHAIRMAN ZIEMER: Okay. Very good. Let's proceed with Issue 5, which is called "insufficient justification for selection of IREP energy range fractions for photon exposures".

MR. FITZGERALD: Yes, before we lose Ron, actually, these next couple would be ones that are dear and close to your heart, Ron. Do you want to walk through both this one as well as the neutron issues?

DR. BUCHANAN: Okay.

MR. FITZGERALD: Or not?

DR. BUCHANAN: Yes.

MR. FITZGERALD: That was a pretty notable sigh.

(Laughter.)

I can cover them, if you want.

DR. BUCHANAN: Yes, why don't you go ahead?

MR. FITZGERALD: All right.

DR. BUCHANAN: Because I will ring off.

MR. FITZGERALD: Yes, you have to leave anyway, but these are ones that I think are pretty straightforward.

Item 5 really gets into the IREP energy range fractions for photon exposures. In this case, we focus on building 5171 accelerators. It appears that a single photon energy distribution is given, and 10 percent of that measured dose is assigned to certain energy range, in this case 30 to 250 keV, and 90 percent is assigned to greater than 250 keV. And then, again, that distribution is

applied to the entire history of accelerator use over the years at Berkeley without any distinction during that time period.

This gets, I think, to something that Dr. Richardson raised a little earlier, which is, you know, there is a dynamic history of the way the accelerators came on and how they were operated. We question whether you can get by with this single energy distribution covering that length of time for these accelerators. And that is kind of the core of that particular question, whether that is an oversimplification, given sort of this rich history of accelerator use, of certainly the different energy ranges that would have been involved in that use.

I think we did get a response from NIOSH that they would go back and take another look at what is called The Health Physics Manual of Good Practices for Accelerator Facilities and see if that should be adjusted.

So, I guess I would turn to Lara.

I think that was our concern on that one. This is on the Rev 01 TBD.

DR. HUGHES: Yes, I think the revision has not changed this guidance. So, yes, I mean, as you mentioned, we would have to go back and look at it. There is really no explanation we have to resolve it right now.

CHAIRMAN ZIEMER: Yes, and at the moment NIOSH has agreed that they need to do that. So, I guess that is where we stand. It is a NIOSH action, right?

MR. FITZGERALD: Yes, and this is related to that first one in the sense that it is the granularity. I think, certainly, it is possible to come up with the appropriate range, but this one, we question whether it would envelope all the years and all the accelerators.

CHAIRMAN ZIEMER: Right. But NIOSH is saying that they are going to review this table now and compare it to the information in the Health Physics Manual of

Good Practice.

MR. FITZGERALD: I would even go further, even beyond that manual.

CHAIRMAN ZIEMER: And other --

MR. FITZGERALD: And the source-term review that they are talking about --

CHAIRMAN ZIEMER: Right.

MR. FITZGERALD: -- the historic source-term review.

CHAIRMAN ZIEMER: Right.

MR. FITZGERALD: That would also help make a decision as to whether that would be appropriate.

CHAIRMAN ZIEMER: Right. And then, they say, "Additional data capture will be performed" --

MR. FITZGERALD: Right.

CHAIRMAN ZIEMER: -- which gets to that same issue we talked about in item 1, what were the operations and the time periods, and so on.

MR. FITZGERALD: Yes, this gets to

the dynamic question, the granularity question, and certain ones we have raised before. But this applies to how the energy distribution would be handled.

CHAIRMAN ZIEMER: And so, that appears to be a NIOSH action.

And, Dr. Richardson, do you want to add to this?

MEMBER RICHARDSON: No. That sounds like a good plan forward.

CHAIRMAN ZIEMER: Okay. Are we okay on that, then? I mean in the sense that NIOSH has the action on this one. Okay.

Issue 6?

MR. FITZGERALD: Yes, issue 6 --

CHAIRMAN ZIEMER: Neutron dosimetry.

MR. FITZGERALD: Issue 6 is kind of the same issue. And, Ron, jump in before you leave if I am wrong about this. But, you know, it is sort of the same energy threshold question that we have raised in the past and

whether the workup in the Site Profile -- and again, we are going back to Rev 01, 2007. So, I think it is a rhetorical issue.

Of course, it did not reflect some of the developments and the assessments that have been done, sort of this issue that has arrived at a different place that includes certainly a better recognition on the NTA cutoff use of even MCNP in some cases to address the assignment of dose when you get to the level where the NTA is not responsive.

There is also even, I think, some information out of the Brookhaven review where there were some questions about whether the CR-39 and other plastics, whether the dosimetry involved in that was reliable. I mean, there's just a number of questions that I think the Site Profile would benefit from in terms of reworking the neutron dosimetry section. That would be a short-form way of going through all what we put in here in terms of the details.

We have not gone through and done a detailed analysis, but a lot of these issues are sort of the same sort of issues that we have raised in the past about reliance on N/P ratios, the NTA film threshold, and all the rest, and some of the correction factors that would have to be put in place.

CHAIRMAN ZIEMER: Well, I think NIOSH has indicated that they plan to revise table 6.4, right? So, that remains to be done.

MR. FITZGERALD: Right.

CHAIRMAN ZIEMER: And then, there are some other statements here. It would seem to me that, SC&A, you need to evaluate not only what you see in the revision, but these additional statements.

MR. FITZGERALD: Yes, we need to look at the revision that was done in Rev 2 that did add in a lot of what I just said and see whether or not that answers some of these issues. It brings the overall assessment up-

to-date with what we have done already.

DR. BUCHANAN: Yes, this is Ron Buchanan.

Yes, we need to go through. Like I say, we didn't do any in-depth technical review of Rev 2. So, we need to go through and see what is covered and not covered. I mean, I did a scanning of it and I see several points that were covered and several points that weren't.

And I guess the best way would be we can either do it one of two ways. We can go through it and then write like a White Paper on it and get NIOSH's response. Or, if NIOSH has a quick solution to some of the things they said they were going to do, they could send that to us, and then we could do a review of it plus the Rev 2 and write a White Paper on that. So, whichever way you would like to do it.

CHAIRMAN ZIEMER: Well, NIOSH, do we know at this point what a new table 6.4 is

going to look like? Or is that something that is going to require a fair amount of work?

You're saying at the end of that paragraph, "Table 6.4 will be revised accordingly." That is, I think, accordingly in terms of what you said above this. So, as I read that, that would be what I am understanding you are saying.

DR. HUGHES: Yes, it seems to refer to this issue with the LOD of the CR-39 dosimeters.

CHAIRMAN ZIEMER: Right.

DR. HUGHES: And I am not really sure. I would have to go back to the people involved with the writing of the TBD and it appears to be that this involves some checking of the literature and revision of some numbers.

CHAIRMAN ZIEMER: So, maybe there's two things that could happen here. One would be for NIOSH to -- well, let me look at it.

Is the only revision going to be in the LOD value? Or do we know that? In other words, is --

DR. NETON: Is Matt Smith on the phone?

MR. SMITH: Yes, this is Matt.

DR. NETON: Can you chime in here?

CHAIRMAN ZIEMER: Is it going to be the 15-millirem for all those periods?

MR. SMITH: Well, that is for the CR-39.

CHAIRMAN ZIEMER: Yes, for the CR-39 only, right. Okay.

MR. SMITH: Right.

CHAIRMAN ZIEMER: Is that the only revision we are talking about in that table?

MR. SMITH: Yes. Yes.

CHAIRMAN ZIEMER: Okay.

MR. SMITH: That would be it. The other items, you know, are addressed in the revision that is currently --

CHAIRMAN ZIEMER: Right. So, I

guess, then, that is enough information, Joe.

MR. FITZGERALD: Yes.

CHAIRMAN ZIEMER: SC&A can proceed with their review then, knowing that the one value is going to change in the table.

MR. FITZGERALD: Right. If the LOD for CR-39 is the only thing that might be revised, I think we could proceed, then, and provide a White Paper on how neutrons are treated.

DR. BUCHANAN: Yes, I agree.

MR. FITZGERALD: Okay.

CHAIRMAN ZIEMER: And, again, Dr. Richardson, additional comments on this one?

MEMBER RICHARDSON: Just one small question, and this is maybe just a standard thing. It says neutron doses are entered as chronic exposures. Is that just standard practice? What is the basis for that?

MR. SMITH: Yes, that is a guidance that is given in the IREP technical document. It is out on the website, probably

in the same location where you find documents like IG-001 for external dose.

DR. NETON: Yes, it is considered to be claimant-favorable to enter them as chronic exposures, I think based on the DDREF, if I am not mistaken.

CHAIRMAN ZIEMER: If the DDREF has been looked at by the --

MR. SMITH: That is the longstanding, more dramatic thing that we have been doing since inception here.

DR. NETON: Yes, we went through all the various modes of external exposure and triaged them based on, if we didn't know what the exposure pattern was, which mode, chronic or acute, would give the higher essentially PC value or give the possibility of a higher PC value. And chronic would provide a higher PC than an acute.

MR. SMITH: For neutrons.

DR. NETON: Yes. And it is escaping me right now; I used to know the

function and everything, but I can't remember off the top of my head.

MEMBER RICHARDSON: Okay.

CHAIRMAN ZIEMER: Okay. Any other comments or questions on this one?

(No response.)

SC&A has the action on that.

MR. FITZGERALD: Right, we will take that.

CHAIRMAN ZIEMER: And issue 7, "failure to justify the shallow dose assumption".

MR. FITZGERALD: Yes, I think there we didn't see as much treatment on the subject in the TBD, at least Rev 1, where workers may have been exposed to significant shallow dose, and how appropriately would deep dose be used as an indicator. I think the concern is that, particularly for the early years, pre-`79, there really isn't any record of beta exposure that we could find.

So, there is some concern over an

assumption. I guess the assumption was a factor of three, the ratio of shallow to deep dose. And there is not a whole lot of substantiation whether that, in fact, is claimant-favorable.

And again, I think what we documented, based on interviews and review at the site, was it appears there's certainly a number of activities, particularly with the crafts workers, where you would have had certainly more of an opportunity for skin exposure, contamination on the skin. And some of the shallow dose would have been more significant in that regard. So, that is where we see maybe a gap, if you may, in the Site Profile.

Now the OTIBs that are referenced in the NIOSH response I don't believe were in place at the time we did the review. Or maybe they were. Maybe we just didn't account for them.

But we will have to take a look at

OTIB-10, OTIB-13, and see to the extent that that would augment what is in the Site Profile. They weren't referenced and I think may not have been referenceable back in 2007 anyway. But that might actually provide the answer to how dose reconstruction would be done in the shallow dose. So, we need to take a look at those, and I think that would update our review from that standpoint.

CHAIRMAN ZIEMER: Yes, I am trying to remember if those OTIBs have been reviewed by the Procedures Committee.

DR. NETON: I think at least one of them has, the glove box I am pretty certain.

MR. FITZGERALD: One is the glove box, and the other is the geometric exposure.

DR. NETON: The other one is the geometry. I think that one as well, that started off with sort of a Mallinckrodt-specific document.

CHAIRMAN ZIEMER: Right, right.

MR. KATZ: Right. They have both been reviewed by Procedures.

CHAIRMAN ZIEMER: I don't know if there are any open items on those, but, Joe, I think probably the action is just double-check.

MR. FITZGERALD: Yes.

CHAIRMAN ZIEMER: And, of course, Steve --

DR. MAURO: Marschke.

CHAIRMAN ZIEMER: Huh?

DR. MAURO: Steve Marschke.

CHAIRMAN ZIEMER: Marschke. I blanked out there for a minute. Steve Marschke has that database readily available. We all do, actually.

MR. FITZGERALD: Yes, this might be just a case of --

CHAIRMAN ZIEMER: Check on that.

MR. FITZGERALD: Yes.

CHAIRMAN ZIEMER: And then, if you would go back, also, and see if you agree with

this NIOSH response here?

MR. FITZGERALD: Yes, yes. My sense is that, since these OTIBs were not part of the 2007 Rev 1 version of the TBD, this might go a long ways to satisfying the issue we have, which is there is just no real good treatment of how you would do it. So, assuming that the Rev 2 now references that and would include that, that would do a lot toward resolving that issue.

CHAIRMAN ZIEMER: Okay. So --

MR. FITZGERALD: We will take a look at --

CHAIRMAN ZIEMER: The action would be SC&A to --

MR. FITZGERALD: Yes.

CHAIRMAN ZIEMER: -- review this response in detail, as well as those OTIBs, and make sure that that meets your concerns.

DR. MAURO: I think OTIB-17 should be in that list also -- that deals with non-penetrating radiation -- along with the other

ones you mentioned, Joe.

MR. FITZGERALD: OTIB-17?

DR. MAURO: Yes.

MR. FITZGERALD: All right.

MR. SMITH: Yes, this is Matt. Just a couple of comments.

And you're absolutely right, John, OTIB-17 is now called out in Section 662 of the current revision.

And with respect to the extremity dose factor of three, it is also in that section. It is being based on the historical dose limits that were in place at the time.

CHAIRMAN ZIEMER: Okay.

MR. SMITH: The discussion of the rationale for that is given in that section.

CHAIRMAN ZIEMER: Dr. Richardson?

MEMBER RICHARDSON: No. No questions.

CHAIRMAN ZIEMER: Okay. I think we can proceed then.

MR. FITZGERALD: Okay.

CHAIRMAN ZIEMER: Issue 8, "uncertainty in beta gamma dosimetry response to radiation types and energies".

MR. FITZGERALD: Yes, this gets to the electroscope data issue. Yes, I think there is an acknowledgment that there are some real questions and certainly a cost-sharing note about its use.

There was some concern about how that data would be used in the earlier years and the fact that there wasn't a whole lot of information provided in terms of how that would be applied. We didn't see any change in Rev 2. But the response, I guess, that NIOSH provided, that there is, in fact, a statement that highlights that information, the results from the electroscope data needs to be used cautiously and should not be used preferentially in terms of film or TLD results. I think all that is helpful.

So, we need to take a look at that, Paul.

CHAIRMAN ZIEMER: Okay.

MR. FITZGERALD: But just based on that response, I think we don't see a major issue.

CHAIRMAN ZIEMER: All right. And all that electroscope data had to be in the really early years.

MR. FITZGERALD: Yes, yes.

CHAIRMAN ZIEMER: Probably in the forties.

MR. FITZGERALD: And is encompassed by the SEC. So, there's a lot of qualifiers on this one.

CHAIRMAN ZIEMER: It is apparently pretty sparse and we don't have calibration information on that.

You know, an electroscope is a pretty basic instrument in a way. If it is working right, you shouldn't have to calibrate it because it reads charge per unit volume, which is the way that the roentgen was originally defined. It was one electrostatic

unit per cubic centimeter, I believe. It was a volume, not a mass, at standard temperature and pressure.

So, if the electroscope is working right, you don't have to calibrate it against anything because they wouldn't be reading in length and units, I guess. Or maybe the early ones just read out in ESUs.

But I think the problem was they got different results with multiple readings or something. I can't remember exactly what the problem was.

MR. FITZGERALD: There is something in the literature that suggests that they had divergent readings.

CHAIRMAN ZIEMER: Yes, right. Right. It didn't match up with the film or something like that.

But let's see. So, SC&A needs --

MR. FITZGERALD: Well, we would be satisfied as long -- this is just one of these, I am not sure we need to spend a lot of

time on it. I think we are concerned that, clearly, there was some question about reliability. If that information is going to be used, it needs to be used with a high degree of caution. I think that language has been added in Rev 2. I'm not sure there's a whole lot more one could do with that.

CHAIRMAN ZIEMER: Right. I mean, it is the only information there.

MR. FITZGERALD: It is the only information you've got.

CHAIRMAN ZIEMER: They might try to use it in some way for bounding a dose or something; I don't know.

MR. KATZ: Right. And if it is for pre-`48, you are not even doing those external doses.

DR. NETON: Well, we are.

MR. KATZ: But the SEC says that you don't have information for prior to `48 to get external --

DR. NETON: Does it?

MR. KATZ: Yes.

DR. NETON: Ted is more familiar with it.

MR. KATZ: Yes. So, it knocks out that as well as the internal.

CHAIRMAN ZIEMER: Yes, `42 to `48, you had neither, and then in `48 to `60 it was -- so, it may be a moot point in that sense.

MR. FITZGERALD: Right.

CHAIRMAN ZIEMER: You guys go back and make sure.

MR. FITZGERALD: I think we can go back, but I think the additional language puts it in better perspective. I think, again, there was some concern about having it put out there but without any additional qualifiers about using it.

CHAIRMAN ZIEMER: Right. And in electroscope days, there aren't going to be any TLDs to compare with. They didn't exist then.

MR. FITZGERALD: No. No. See,

the only thing we threw out there was in the literature -- and this is on the O: drive -- when they did, in fact, do some comparison studies, it was pretty divergent. I mean, obviously, they are going to be very much --

CHAIRMAN ZIEMER: They could have compared the films, I guess.

MR. FITZGERALD: Yes.

CHAIRMAN ZIEMER: Okay. All right. Dr. Richardson, do you have any comments on this one?

MEMBER RICHARDSON: No, no.

CHAIRMAN ZIEMER: Thank you.

Okay. Issue 9, "X-ray exposures are uncertain".

MR. FITZGERALD: I would be hesitant to ask for more on medical X-rays.

(Laughter.)

I think we did have some questions that we raised in the finding itself, as you can see. You know, where did the workers get the exams and the rest of that? But most of

those, if not all of them, were, in fact, treated in Rev 2.

I think we would want to go back and just walk through that in detail, but my read is it is certainly a more complete section on the TBD.

CHAIRMAN ZIEMER: Yes, I guess let's just ask you to evaluate this recent response.

MR. FITZGERALD: Right. But it is pretty substantive now. I think we kind of touched on that earlier, that that section was done with a great deal of enthusiasm.

(Laughter.)

CHAIRMAN ZIEMER: So, SC&A is going to come back with a finding that it is too much information?

(Laughter.)

MR. FITZGERALD: I would doubt we would have much more to add on Rev 2. But definitely an improvement off of Rev 1 on X-rays.

CHAIRMAN ZIEMER: All right. Okay. Dr. Richardson, any comments on Issue 9?

MEMBER RICHARDSON: No.

CHAIRMAN ZIEMER: No? Okay.

Okay, Issue 10?

MR. FITZGERALD: Issue 10, this gets tied into the SEC in a long way. Some of the uncertainties that we saw in terms of the actual dose estimation calculations prior to 1961, whether it is MDAs, whether it was the actual use of the claimant files, I mean, this is sort of made moot by the SEC. So, again, this gets back to how the Work Group wants to handle it.

I think we did have some issues and questions about how the dose estimations would be done prior to `61 because of the problems with the lack of information. I think that has been made moot because I think NIOSH agrees and has recommended the SEC.

So, we really don't think we have

an issue, unless the Work Group wants us to look at something.

CHAIRMAN ZIEMER: From my point of view, this one is closed.

MR. FITZGERALD: Yes, that is kind of where we are at, too.

CHAIRMAN ZIEMER: Let me ask Dr. Richardson if he agrees.

MEMBER RICHARDSON: I think that is right, yes.

CHAIRMAN ZIEMER: Okay. So, there is no issue here. No followup needed. So, we consider that a closed issue.

MR. FITZGERALD: Issue 11 actually overlaps an earlier issue. Again, this is the diversity of nuclides that were in use at Berkeley and to the extent one had to address those in a more complete way and demonstrate that the MDAs and the in vitro/in vivo bioassay programs were appropriately done.

I think NIOSH's response also echos the fact that their response is the same

as it was before on the MDA. So, I think this is in a lot of ways repetitive.

DR. NETON: Yes, this is going to be addressed by the completeness and the --

MR. FITZGERALD: Adequacy.

DR. NETON: -- adequacy --

MR. FITZGERALD: Right.

DR. NETON: -- of the modeling program.

MR. FITZGERALD: I mean, this was framed a little differently, but, in essence, it is a similar issue.

DR. NETON: Yes, almost the same issue.

MR. FITZGERALD: This gets more specific about certain things, like thorium, plutonium --

DR. NETON: Right.

MR. FITZGERALD: -- curium, actinium, but it is the same issue in terms of source-terms. So, I would recommend that it be subsumed under the adequacy and

completeness piece.

CHAIRMAN ZIEMER: Okay. Which is No. 2.

MR. FITZGERALD: Two and 4, I think.

CHAIRMAN ZIEMER: Right. So, we will just indicate that addressing Issue 2 and 4 will take care of Issue 11.

Again, let me ask Dr. Richardson if he agrees with that.

MEMBER RICHARDSON: Yes.

CHAIRMAN ZIEMER: Okay. We're sailing along here.

MR. FITZGERALD: I tried to put the harder ones upfront.

CHAIRMAN ZIEMER: Right.

We're up to Issue 12. This is "failure to provide sufficient guidance for unmonitored workers."

MR. FITZGERALD: This is the coworker issue, which I think Lara mentioned there is not a coworker model per se.

DR. HUGHES: No.

MR. FITZGERALD: Is that right?

So, this is a little bit of a question whether in NIOSH's judgment there is a need for one, given the completeness of the information at hand.

CHAIRMAN ZIEMER: Will this be partially answered by the completeness question?

MR. FITZGERALD: I think so.

DR. NETON: This is about like what happened at a number of facilities where, once we evaluate all the available data, we may still have the position that we don't need a coworker model because all the people that were potentially exposed were appropriately monitored. And if not, then we do allow for a possibility here; we will have to go back and develop methods.

MR. FITZGERALD: And this also gets into the one where we are talking about exposure pathways. If there is one where

monitoring was not done --

CHAIRMAN ZIEMER: Right.

MR. FITZGERALD: -- then the question is, well, how would you -- there might be, in fact, a way to do it, but it hasn't been proposed yet.

CHAIRMAN ZIEMER: Do we know at this point whether there were groups within the restrictive area of what we call Berkeley laboratory, whether there were unmonitored workers like clerical workers?

DR. HUGHES: We have something to show there was.

MR. FITZGERALD: Yes, there definitely was. It was a research campus. I mean, not everybody was --

CHAIRMAN ZIEMER: Not everybody was monitored?

MR. FITZGERALD: That's right.

DR. NETON: This will be fleshed-out in our response to those other issues.

CHAIRMAN ZIEMER: So, what will

happen on this one, presumably, is that after the other stuff is addressed on completeness and adequacy, the NIOSH response here may change or --

DR. NETON: Correct.

CHAIRMAN ZIEMER: -- or be added to? So, the next step would be an expansion of the NIOSH response or you would say, based on what you found, this is our response.

DR. NETON: Right, exactly.

CHAIRMAN ZIEMER: Either way. So, it is NIOSH. Okay.

Dr. Richardson, any additional comments on this one?

MEMBER RICHARDSON: No. I think they just need to follow up with that.

CHAIRMAN ZIEMER: Okay. I assume others will chime in if they have comments, John Mauro or --

MR. FITZGERALD: Yes, this is the logical fallout --

CHAIRMAN ZIEMER: Right.

MR. FITZGERALD: -- once we complete adequacy and completeness, as to whether unmonitored workers --

DR. MAURO: Yes, I have no additional comments.

CHAIRMAN ZIEMER: Yes. Issue 13, "inadequate coverage of occupational environmental dose." Joe?

MR. FITZGERALD: Yes, I mean, there we felt that there wasn't as -- and this sort of ties into the very first finding we made. There is a need for more comprehensive description of the historical environmental dose that existed.

And this sort of gets to the lack of coverage on accelerators and the history of accelerator operations, in the sense that there were, as you know, some emissions from target areas that would have represented environmental exposures, but since there wasn't really a very granular discussion of accelerator operations in those source-terms,

you don't get a very good perspective on what those sources might have been onsite.

There is a maximum sitewide value that is used, but it is difficult to know what the basis for that is without having these other things addressed.

Now, certainly, one issue that is very useful to have reflected -- and again, I wasn't involved in the specific finding -- but in terms of the Cobalt-60 irradiator in `74, I think the benchmarks that NIOSH provided suggest that that very minimally contributes to external exposure to workers that were outside that particular operation. I think that was one question that was highlighted in the Site Profile review that SC&A deducted. So, I think that is a response to that particular one.

And the question about I-131 as being a benchmark, a more suitable benchmark, I think, Lara, it looks like NIOSH agrees that maybe I-131 might be a better bounding value.

Is that what that basically says?

DR. NETON: Well, for thyroid.

MR. FITZGERALD: For thyroid I mean.

CHAIRMAN ZIEMER: Is that yet to be done?

DR. NETON: Yes, it says, "guidance will be provided." I think we need to modify the Site Profile here to include guidance to pay attention to the metabolic organ that might be maximized in a given exposure scenario.

I haven't looked at -- I don't know what is documented in their file. But I think we would agree with the statement. So, we will modify the Site Profile accordingly.

MR. FITZGERALD: I think, Paul, this goes sort of hand-in-glove with a little more detailed operational description which would then give you a better perspective if there are environmental emissions which would be from target areas. You might get a better

picture on what the source-term would be from the sitewide standpoint.

CHAIRMAN ZIEMER: You are suggesting here that, once we deal with Issue 1, just some question on the historical --

MR. FITZGERALD: I think this question of whether or not you would get a better sense of what the environmental dose would be -- I wouldn't think this would be a separate enterprise. I think it would just be, are there any environmental sources that weren't picked up in that section that would obviously come from an operational review? And would that change the conclusion about what the ambient environmental dose would be? It may not.

CHAIRMAN ZIEMER: Dr. Richardson, what comments do you have on this one?

MEMBER RICHARDSON: I don't think I have any further. It looks like NIOSH is going to, if I am understanding this, NIOSH is going to update the guidance on iodine, and

their conclusion regarding the cobalt-60 is that it is very small.

CHAIRMAN ZIEMER: Well, Joe, you were hinting at the possibility that there might have been additional environmental levels from the cyclotron operations?

MR. FITZGERALD: Well, yes. What I am saying, if you do an operational history workup on the accelerators, the question I would have, would that give you any additional information of what emissions might be relevant on the environmental side or not? Like I said, I do not know if that would or not.

I think the dose significance probably was relatively small from that source, but it would be a useful thing as an adjunct to looking at the accelerators and coming up with that description, to see if there was anything that would change your mind on the environmental side.

I think the finding here was that

there was not a whole lot of description on what the historic environmental sources might be. And I think that is sort of the same thing that we were saying earlier. It sort of goes by the original --

CHAIRMAN ZIEMER: I am not sure I remember reading even -- was the shielding in the early cyclotrons based on the early NCRP-recommended limits to the public? Or do you recall, Jim?

DR. NETON: I don't recall.

CHAIRMAN ZIEMER: If you go back, they are quite a bit higher than recommended nowadays.

We had a cyclotron at our place at Purdue that was one of the early ones and based on the Berkeley design. And I tell you that, when it was operating, we had some pretty high backgrounds in surrounding labs and classrooms that would not be allowed today.

I am just wondering, do we know

what those were?

DR. NETON: No, not off the top of my head.

CHAIRMAN ZIEMER: No?

DR. NETON: It's got to be fleshed-out.

CHAIRMAN ZIEMER: Yes, so maybe this will flesh-out as No. 1 is fleshed-out.

But what is going to happen here next? Is this one where, as you get into the other parts, NIOSH, you will look at this and see whether your response changes?

DR. NETON: Well, I think the second part would be the use of effective dose equivalence. There is a valid point that, depending upon which radionuclide a person is inhaling and which cancer they have, you know, they could be different. Effective dose is, obviously, averaged over a number of different organs.

So, I think we need to go back and pay a little more attention here on the

assignment of internal dose from environmental intakes.

CHAIRMAN ZIEMER: Okay. Mainly the internal dose you would be concerned with?

DR. NETON: Right.

CHAIRMAN ZIEMER: Do you think?

DR. NETON: I think so. I mean, I am looking at the Site Profile. We have intakes for gross alpha/beta tritium and carbon-14. I think the contention may be that what is included in that gross beta, is it strontium-90, is it iodine-131, you know, that sort of thing?

CHAIRMAN ZIEMER: Yes.

DR. NETON: And depending on what nuclide it is, it could make a difference in the reconstructive dose to a certain cancer. So, I think we need to go back, do a little homework, and look at the potential mix of the different betas that could have been present, and iodine possibly being one of them.

CHAIRMAN ZIEMER: Right. Iodine

and whether or not there is a significant strontium component.

DR. NETON: Right.

CHAIRMAN ZIEMER: Okay. Joe, does that seem to address what your concerns are at the moment?

MR. FITZGERALD: Yes, pretty much.

CHAIRMAN ZIEMER: Okay. That gets us through the matrix.

Well, I have here "General Discussion: Major Issues and Concerns". We have already identified those.

So, the next steps and planning is what is before us. It seems to me there is a fair amount of work that has to be done here. So, this is not going to be real fast, particularly if there is additional data capture. Since we don't have another SEC before us at the moment, I don't see a big urgency on this.

Can you give us a rough idea of how many claims have we received from this

site and how many have been processed? Is that a number you have readily, Jim?

DR. NETON: Yes, I can get that. My recollection is it may be 100-something; 139 rings a bell, but it is probably wrong. Lara is getting it.

You're clicking faster than I can. I have a handicapped index finger.

(Laughter.)

DR. HUGHES: Okay, 199 cases total.

CHAIRMAN ZIEMER: Received cases?

DR. HUGHES: Yes, received, of which 157 are completed.

CHAIRMAN ZIEMER: All right. There's some still in process then?

DR. HUGHES: There's nine active claims and 33 are pulled.

CHAIRMAN ZIEMER: Nine active, and what is it?

DR. HUGHES: Thirty-three called "pulled," which can be a variety of reasons.

CHAIRMAN ZIEMER: Does that mean it has been sent back to Labor?

DR. NETON: Yes.

DR. HUGHES: Yes.

CHAIRMAN ZIEMER: Well, that could be SECs?

DR. NETON: That could be SECs, although I would think there might be more than that.

CHAIRMAN ZIEMER: You would think there would be more.

DR. NETON: Or maybe they were pulled -- well, yes, I don't know. Good question. Normally, about 60 percent of our cases are SEC cases.

DR. HUGHES: Yes, so largely SEC pulls, it seems like.

DR. NETON: Yes, they are SEC pulled. So, they were pulled for the SEC. Maybe they were in progress at the time or --

DR. HUGHES: Yes.

DR. NETON: -- no decision had

been made.

MR. KATZ: So, why would they be on hold then?

DR. NETON: No, pulled. Pulled means that they are off of our --

MR. KATZ: Yes, pulled. So, they are off the slate?

DR. NETON: They are off our slate, and we never return a case, but, essentially, it has been returned to the Department --

CHAIRMAN ZIEMER: Right. On completed cases, if you had your usual roughly 30 percent successes for meeting the PoC value --

DR. NETON: Right. Correct.

CHAIRMAN ZIEMER: -- that would mean you would have around 50 cases --

DR. NETON: Remaining.

CHAIRMAN ZIEMER: -- 50 that were compensated?

DR. NETON: Right.

CHAIRMAN ZIEMER: And then --

DR. HUGHES: They have greater than 50 percent referred to --

CHAIRMAN ZIEMER: And usually, the rate for SEC cases is usually closer to 60 to 65 percent.

DR. HUGHES: Right.

DR. NETON: Right.

CHAIRMAN ZIEMER: Which means that, of the other 100, you would expect about 60 of those to be --

DR. NETON: SEC.

CHAIRMAN ZIEMER: -- SEC. So, the 30 doesn't seem high enough.

DR. NETON: Yes.

CHAIRMAN ZIEMER: Well, in any event, there's --

DR. NETON: I don't think we list on our website as pulled if it has already been completed and returned to the Department of Labor.

DR. HUGHES: That's correct.

DR. NETON: I don't think we call that a pulled case. These would have been cases that were in process at some point.

CHAIRMAN ZIEMER: Oh, I got you. I got you.

DR. NETON: Yes, yes.

CHAIRMAN ZIEMER: So, some of those that were returned could have gone into the SEC anyway.

DR. NETON: Right.

CHAIRMAN ZIEMER: And you wouldn't necessarily know it?

DR. NETON: Right, exactly.

CHAIRMAN ZIEMER: Got you. Got you.

DR. NETON: Exactly.

CHAIRMAN ZIEMER: Okay.

DR. HUGHES: For example, the petitioner, I think she initially had a dose reconstruction that was less than the compensation value, but eventually her claim was compensated under the SEC.

CHAIRMAN ZIEMER: Got you. Okay.

MR. KATZ: And Stu will give details on this when we do your presentation for the --

CHAIRMAN ZIEMER: Right. Yes.

MR. KATZ: -- Berkeley meeting.

CHAIRMAN ZIEMER: But let me get some sort of feel from NIOSH. This is February. Are we likely to be ready to go in July or August? And I know there's a lot of priority stuff that is pushing. You know, we are trying to finish up a number of places that there are sort of more urgent --

DR. NETON: SECs.

CHAIRMAN ZIEMER: And SECs.

DR. NETON: You mean to have full responses and revisions where we deem appropriate? I would say the August timeframe is probably more likely than July, but I am reluctant to give any definitive time.

CHAIRMAN ZIEMER: Well, I am just trying to -- we don't have to decide today

that far ahead. But probably thinking about a Work Group meeting sometime in maybe September or something like that or October even.

DR. NETON: I think we should be able to do something by then.

CHAIRMAN ZIEMER: August is six months off.

MR. KATZ: You want the Work Group ahead of doing any TBD actual revisions, right? You won't actually revise the TBD again --

DR. NETON: Right. Yes.

MR. KATZ: -- prior to holding the Work Group meetings.

DR. NETON: No, we will have our positions outlined and White Papers done --

MR. KATZ: Yes.

DR. NETON: -- and that sort of thing.

MR. KATZ: And SC&A's input on all this.

DR. NETON: Right. Yes.

CHAIRMAN ZIEMER: So, I am going to make a note here, and then we can track this. Target mid-September for Work Group meeting, just as a rough timetable.

And then, if NIOSH finds that there is going to be a delay, for whatever reason, whether it is getting the information or other pressing things, you say, "You know, we're not going to be able to get you materials in time."

To some extent, Joe, there are some things you guys can probably do right away pretty easily, but you just do them and have them ready, and other things you are going to be dependent on NIOSH's output.

MR. FITZGERALD: Right, right.

CHAIRMAN ZIEMER: So, I think we would be all right. Ted, what do you think about --

MR. KATZ: Yes, and if things move along more quickly for some reason, that's great. We will push things up.

CHAIRMAN ZIEMER: So, we won't set an actual date today. We will have to get input from Dr. Lemen also.

And I also want to find out whether Dr. Melius wants to have any alternates ready for Work Groups or not.

MR. KATZ: Alternates for this group?

CHAIRMAN ZIEMER: Yes. Maybe not.

MR. KATZ: Yes, I think he is trying to keep them streamlined, these Work Groups.

CHAIRMAN ZIEMER: Yes, streamlined.

MR. KATZ: Three Members, when it is possible.

CHAIRMAN ZIEMER: Well, I mean, we have made pretty good progress here.

MR. KATZ: Yes.

CHAIRMAN ZIEMER: I think we can move it along.

Okay. I believe that completes

our tasks for today.

MR. KATZ: Yes. I think everybody, both DCAS and SC&A, keep the Work Group in the loop with your memos back and forth and pushing these issues along.

MR. FITZGERALD: Yes, I think what you are going to see is some of the analyses, White Paper analyses we can do now, like on neutrons and whatnot.

MR. KATZ: Right.

MR. FITZGERALD: So, maybe in the next couple of months or so you will see those.

CHAIRMAN ZIEMER: And let me ask you, is John Stiver still on the phone?

MR. KATZ: John Stiver, are you still with us?

(No response.)

No?

MR. STIVER: Yes, this is John. I just had my phone on mute.

CHAIRMAN ZIEMER: Oh, John, you

heard this discussion, and I just wanted to see if, from a management point of view, any issues or concerns for SC&A?

MR. STIVER: Based on what I have heard today, I don't see that there are any big concerns. I think we will be able to meet these deadlines without any problem.

CHAIRMAN ZIEMER: Okay.

MR. KATZ: Okay. And do you need any support, Paul, for giving an update at the Board meeting?

CHAIRMAN ZIEMER: No, I don't plan to go through the matrix and give any detail.

MR. KATZ: Oh, no.

CHAIRMAN ZIEMER: I am just going to report that we have met, that we have gone through the issues matrix. We have had discussions on each item, that SC&A and NIOSH have specific tasks they are following up on, and that we are moving ahead on those issues. So, it will be very brief.

Well, there won't be petitioners

there, but if there are site people there that have specific questions or want to provide information, why, we'll be there.

MR. KATZ: Because you are paired up with Joe, who will be covering Stanford Linear Accelerator --

CHAIRMAN ZIEMER: Right.

MR. KATZ: -- giving a brief update on that as well for the local audience.

Stu will cover how things are going with dose reconstruction, and so on, upfront.

But okay.

MR. FITZGERALD: And I guess all the relevant reports will be available, if they want to see them.

MR. KATZ: Sure.

CHAIRMAN ZIEMER: Right. Okay.

MR. KATZ: Thank you, everyone.

CHAIRMAN ZIEMER: Dr. Richardson, any further comments or questions?

MEMBER RICHARDSON: No, I think

the proposed note that you have for aiming for September sounds good.

CHAIRMAN ZIEMER: Okay. Then, with that, we will adjourn.

Thank you.

(Whereupon, at 11:35 a.m., the meeting was adjourned.)