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

convenes the

WORKING GROUP MEETING

ADVISORY BOARD ON

RADIATION AND WORKER HEALTH

Y-12

The verbatim transcript of the Working Group Meeting of the Advisory Board on Radiation and Worker Health held telephonically on April 11, 2006.

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-- "*" denotes a spelling based on phonetics, without reference available.

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P R O C E E D I N G S

(1:00 p.m.)

WELCOME AND OPENING COMMENTS

DR. LEWIS WADE, DFO

DR. WADE: This is Lew Wade again, and I have the pleasure of serving as the Designated Federal Official for the Advisory Board. This is a working group of the Advisory Board, so far the hardest working of the working groups. This working group that's chaired ably by Mark and populated by Mike, Wanda and Robert has taken on a variety of issues, among them individual dose reconstruction reviews, procedures reviews. They have recently been very involved in site profile reviews, particularly the reviews of the site profiles for Y-12 and Rocky Flats.

This meeting, however, marks the first formal time this working group will be talking about the SEC petitions for today, Y-12, and tomorrow for Rocky Flats. The decision was made, and I think quite correctly, that this working group would continue with its pursuit

of the Rocky Flats and Y-12 issues that it ably began when it was doing the site profile reviews rather than ask Dr. Melius' working group which is equally talented to pick up Y-12 and Rocky from an SEC point of view. So that's what we're here to do today, Y-12, and tomorrow starting at 10:00 a.m. eastern time, Rocky Flats.

I would like to have, spend some time on conflict of interest issues. Again that looms large now in our reality and with regard to the Board, the way the Board has developed its own rules for dealing with SEC petitions, if a Board member is conflicted at a particular site, then they back away from the table during SEC discussions. They can make comments as a member of the public. They can participate and listen to a meeting as a member of the public but not at the table as a Board member. Obviously, they wouldn't be making motions or voting on motions in that case.

Relative to Y-12, we have Board members who are conflicted. They are Dr. DeHart, Robert Presley, Dr. Ziemer, Mark

Griffon only when an action has been filed by the Atomic Trades and Labor Council. So for this call, although they're not with us right now, DeHart, Presley and Ziemer would be conflicted.

Before I go on and ask others to identify conflicts as it relates to Y-12, I would remind you that we don't want to have a quorum present for a working group. That makes it a Board meeting and different rules prevail. So I would ask Board members when we go through the introductions to identify yourselves. And I noticed that Liz sent an e-mail out if any Board members are to join us mid-discussion, they need to identify themselves so Liz and Emily and I can keep count of our numbers and deal with any quorum issues.

Again, if we find ourselves at or over a quorum then we would have to respectfully ask the last person to join us to leave so long as that person wasn't a member of the working group. We always want to have the working group members present.

To finish my sort of long-winded

introduction, as you know the government is in receipt of a petition for Y-12, in fact, several, and NIOSH has recently released a petition evaluation report that I know you all have and have at varying degrees of review based upon the short time that you've had it. We're looking at least a timeline now would be for NIOSH to formally present its recommendation at the Board meeting scheduled for the end of April in Denver, Colorado. And then the Board would begin its deliberations.

So with that as a background and before I turn it over to Mark, let me ask that the NIOSH team, that would include folks from ORAU and then SC&A, identify anyone who's on the line and will participate and particularly identify those people who have conflicts relative to Y-12. Again, if a person is conflicted, then as you know they would be conflicted in terms of serving as an author or a reviewer for key program documents. It wouldn't preclude them from making a statement to add to the technical discussion on this call, but it's important that those people are clearly identified. And when they make a

statement people hear their statement understanding the conflict that they possess.

So, Jim, if I could ask you. I don't know who will do it for NIOSH. Whoever's going to start the discussion for NIOSH relative to conflict of interest for the entire NIOSH team including the ORAU folks.

DR. NETON: This is Jim Neton sitting in, I have moved from the Marriott Hotel to Cincinnati, NIOSH buildings here. I'm sitting here and LaVon Rutherford is here with me from NIOSH. We've got some ORAU folks sitting around a table with me and others are on the phone. And honestly, I don't know who they are, so I guess we'll just let the ORAU folks who are around the table in Cincinnati identify themselves and if they have identified conflicts. And then the ORAU people on the phone would follow suit.

MR. FIX: My name is Jack Fix. I'm with Dave Muller and Associates, and I don't believe I'm conflicted with regards to Y-12.

MS. THOMAS: I'm Elyse Thomas, and I'm with ORAU, and I'm not conflicted with Y-12.

MS. BRACKETT: Liz Brackett with MJW, and I

am conflicted with Y-12.

MR. McFEE: Matt McFee with MJW, and I'm not conflicted with Y-12.

DR. NETON: And now for the ORAU folks that are on the phone.

MR. SMITH: This is Matthew Smith, ORAU team, Dave Muller and Associates, not conflicted with Y-12.

MR. TANKERSLEY: Bill Tankersley, ORAU.

DR. WADE: Any conflict?

MR. TANKERSLEY: No.

MR. KERR: George Kerr, no conflict.

(UNINTELLIGIBLE): No conflict.

MR. ADLER: Tim Adler, no conflict.

MR. CHEW: Mel Chew with the ORAU team. I am not conflicted with the Y-12.

MR. RICH: This is Bryce Rich. I'm not conflicted.

MR. STEMPFLEY: This is Dan Stempfley with the ORAU team, and I'm not conflicted.

DR. WADE: Does that finish the NIOSH/ORAU introductions?

MR. ELLIOTT: Well, from NIOSH, Lew, this is Larry Elliott, and Jim Neton and I have signed off on approving this SEC evaluation report,

and from my perspective I'm not conflicted.

Jim, you should speak about your situation.

DR. NETON: I don't believe that I'm conflicted at Y-12.

DR. WADE: Anyone else from the technical team, NIOSH/ORAU?

(no response)

DR. WADE: How about SC&A?

DR. MAURO: This is John Mauro from SC&A. I am not conflicted, and I'd like to handle it the same way that Jim did and ask the participants on the phone from SC&A to each introduce themselves and make their statement.

MR. FITZGERALD: This is Joe Fitzgerald. I'm not conflicted on Y-12.

DR. MAKHIJANI: This is Arjun Makhijani. I'm not conflicted on Y-12.

DR. BEHLING: Hans Behling, not conflicted.

DR. WADE: Does anybody have any questions or comments they wish to make about the conflict of interest policies or situation?

(no response)

DR. WADE: Okay, Mark, I'll turn it over to you then. I think we could do broader

introductions, but I wanted to make sure we had the conflict of interest discussion.

INTRODUCTION BY MARK GRIFFON

MR. GRIFFON: This is Mark Griffon, and I think we should do the same for the Board just to see who's on from the Board. I assume the whole work group is, but this is Mark Griffon. Who else is on?

MS. MUNN: Wanda Munn, no conflict.

MR. GIBSON: Mike Gibson, no conflict.

MR. GRIFFON: And Bob's not on or --

DR. WADE: He might be joining. If he does, he'll identify himself.

MS. MUNN: He said he'd have to be on and off today because of what's going on.

DR. WADE: And Robert is conflicted, and I'm sure he'll tell us that.

Any other Board members on the call at the moment?

(no response)

MS. MUNN: Lew, if you don't mind, I'd like to interject that when I saw the message this morning from Liz, I immediately sent a message back saying it's not clear to me with our present configuration exactly how many

additional members over the four members of a working group would be, would constitute a conflict (sic). And I had just gotten a message back from her saying three would.

DR. WADE: Well, we were not over, we're not in a quorum this morning.

How about other federal employees identifying themselves?

MS. HOMOKI-TITUS: Liz Homoki-Titus, Health and Human Services, and I don't have any conflicts.

MS. HOWELL: This is Emily Howell from Health and Human Services with Robert McGolerick from Health and Human Services, no conflicts.

(UNINTELLIGIBLE): (Unintelligible) NIOSH, no conflicts.

MR. KOTSCH: Jeff Kotsch, Department of Labor.

DR. WADE: Any other feds?

MR. SUNDIN: Dave Sundin, no conflicts.

DR. WADE: This is Lew Wade again, no knowledge, therefore, no conflicts.

MR. GRIFFON: And, Lew, I was just going to ask, any of the petitioners online for this

call?

(no response)

MR. GRIFFON: Apparently not.

DR. WADE: Is there anyone else who would like to identify themselves? It's up to you totally.

MR. DUVALL: Hello, James Duvall, Execution 28.

MR. ELLIOTT: Mr. Duvall is one of the petitioners for Y-12.

DR. WADE: Welcome, and as our rules are, if you have anything to say through this process, please feel free to chime in. Petitioners are more than welcome to participate in the discussion.

MR. GRIFFON: I think the best way to proceed here is if I think most of us now have the handouts or are getting the new documents. But I think maybe what makes more sense is to go through the evaluation report, have NIOSH present on that, and what I might do, Jim, while you present it or whoever's going to present, I might keep track of the matrix that we were using for our previous discussions. And that any time if there's any point of

clarification or whatever, I'd ask either the Board members or SC&A to step up and ask for clarifying points. Also, if there's any outstanding actions which are related to certain areas, I might try to interject and see if those actions were completed, if they're still pending, if they're, you know, what the status is on those actions just to sort of complete that process as well.

So with that I guess I'll turn it over to Jim and whoever's going to sort of walk us through this report.

DR. NETON: Mark, I'm not quite sure, do you want me to give a summary of what we've done here or did you want me to bring in the relevant issues related to the matrix? Because I --

MR. GRIFFON: I think if you can start to go through a summary of what is in the report, I think it would be good, first of all. And then maybe if it makes sense to go through specific sections. And then I think the action items will sort of fall out as we discuss each section, if that makes sense.

SEC PETITION NUMBER 28

DR. NETON: Well, this is the petition evaluation report for SEC petition number 28 which the petitioner original class definition was all steamfitters, pipe fitters and plumbers who worked at Y-12 from October 1944 through December 1957. NIOSH, after having gone through and evaluated a number of sources of information which I'll talk about shortly, modified the class to a proposed class definition of all employees of the DOE or DOE subcontractors who were monitored or should have been monitored for thorium exposures in some specific buildings. And those buildings are Building 9202, 9204-1, 9204-3, 9206 and 9212. If one worked in those buildings and was monitored or should have been monitored for thorium for the 250-day work period from January '48 through December '57 that would be our proposed class.

As typical with SEC evaluation reports, NIOSH started out by reviewing a number of data sources. The documentation literature available on Y-12 is fairly extensive as we discussed in past working group meetings. We do have a site profile

document. There are a number of Technical Information Bulletins reports out there. I think there are seven or more supplemental pieces of technical documentation that have been written about Y-12 in particular relative to the external and internal monitoring programs. Those were cited in the report in review.

A number of interviews were conducted with employees and site experts including health physicists and workers for several purposes. Some were conducted to determine the robustness of the monitoring program, and there was a supplemental interview conducted to determine the nature of weapons-related work in a specific timeframe.

We also looked at previous dose reconstructions in a site research database, and in particular a large part of our evaluation centered on the Center for Epidemiologic Research database where we did some quality control evaluations as well as some data integrity and reliability reviews.

Also looked at the Y-12 Delta view system that those who are on the working group

are aware was discovered fairly recently that a, it's not an electronic database in the strictest sense of the word. It's really an image database that has, I think, over 400,000 individual images within its system. And of course, we looked at the documentation affidavits provided by the petitioners.

Just to briefly go over some of the radiologic operations, Y-12, of course, is primarily, primary hazard of exposure at Y-12 is uranium. There were large amounts of uranium processed, and in particular enriched uranium at Y-12 over the history of the plant. But in addition, where there are what I'll call ancillary sources of exposures to much smaller source terms but nonetheless significant. Those would include exposures to thorium, plutonium, some neptunium, tritium and a few other radionuclides as well as exposures that may have occurred at the cyclotron operation, in '86, the cyclotron that made what we've come to call exotic radionuclides for the most part.

We reviewed all the exposure potentials at those sites that related to the

individual types of exposures, whether they be alpha, beta, gamma or neutron exposures or x-ray generating equipment. And also looked at the extent of the handling of recycled uranium at the Y-12 facility.

So looking at all the available monitoring data, we feel that for uranium exposures at Y-12, we have sufficient information to reconstruct internal and external exposures for those who were exposed to uranium at Y-12 between the, in the class period as well as we can reconstruct exposures that occurred at the cyclotron and some of the Calutron operations that handled plutonium.

Where we believe there is a deficiency in the data to reconstruct doses is in the area of thorium exposures. We have come to learn that thorium was in existence at the Y-12 site from the beginning of this class period through the end of the class period and was used for several different purposes during that timeframe. We have no internal monitoring data for fecal or urine samples that we can find. I think there were samples that were taken, but we just don’t have them

in our possession in the SEC period. And we have just come across very recently some air monitoring data related to the Calutron operations, but we have had insufficient time to review those data and are not prepared to use those in dose reconstruction. So we are not considering them a viable source for this SEC class.

So at the end of the day we're recommending that anyone who had worked with thorium operations or should have been, were monitored or should have been monitored for thorium activities at the facility in the buildings I've mentioned at the beginning of my discussion would be covered as part of the SEC. But we feel that we have adequate information to address the other sources of exposures that I've discussed.

It's a pretty thumbnail sketch of a 140-page document which I'm sure we can go into a lot more detail, but I've hit the highlights.

MR. GRIFFON: I'm just wondering the best way to proceed here. I mean, we could either go through the matrix or we could, I'm looking

at section six where you discussed available monitoring data. I mean, the operations stuff we can probably read at our own opportunity. But it might be useful if you could maybe, you touched on some of this, but maybe go through the available monitoring data a little more closely.

DR. NETON: What page does section six start on?

MR. GRIFFON: Twenty-three on my printout anyway.

DR. NETON: For the internal monitoring data let me start with the uranium data and the data relevant to uranium and the external monitoring data that we have. There's Table 6.2 on page 27 that summarizes that. And as we've discussed in the past -- I'm sorry, it's on page 26. Back in the early years, 1948 and '49 we have no internal, no uranium bioassay data that we could find for the class. But we have data starting in 1951, and as you see, the number of samples ramps up from about 1,000 in 1950 terminating at the end of the class or 1957 with 33,000 samples. So there's a large amount of uranium monitoring data

available.

There is a Technical Information Bulletin that we have that has taken these monitoring records and converted them into a coworker model where we've developed individual exposures by year with geometric standard deviations that we apply to those who were not monitored. As you can see there were a small percentage of the overall workers monitored the earlier years, but through discussions and other information that we've come to learn -- and this is contained in the evaluation report -- we believe that it was ORAU's policy consistently throughout the SEC period to monitor those workers with the highest potential for exposure.

What did I say?

MR. GRIFFON: ORAU's policy.

DR. NETON: Y-12, sorry.

MS. MUNN: Jim, may I interrupt you long enough to ask whoever has a small child in their hearing area, would they please mute their phone? It sounds like a really sweet kid, but it's hard to hear the numbers over it.

MR. GRIFFON: Thank you. I think they did it.

DR. NETON: And like the lack of data in ’48 and ’49 we’ve accounted for by back extrapolating into that period using the data in ’50 forward, and we believe that it’s fairly representative based on an analysis of the types of operations that were ongoing in ’48 and ’49 versus the later years. That is, there weren’t much uranium activities ongoing in ’48 and ’49. That was after the Calutron had been shut down.

One can look at Table 6.2 and the external monitoring records and there’s a similar picture, that is, well, we start off in ’48 with a fair number of records, diminished in the early ‘50s and then increased later on. But again we feel in this particular case as we discussed we have gone from 1961 backwards into, we have an extrapolation mode to predict the external badge results in the pre-’60 period based on the Technical Information Bulletin that we’ve discussed at several of our working group meetings.

And George Kerr is on the phone, and I'm sure we can discuss more about that later if we'd like to get into that. So for the uranium operations we feel that these data allow us to have a pretty good handle on uranium exposures.

If one looks on page 24 and Table 6-1 though I did mention early on that we have exposures to non-uranium isotopes, and in particular, there were plutonium exposures related to the, I think starting in about the 1952 timeframe, the Calutrons were used to enrich plutonium. But we do have from the Delta view system about 740 plutonium samples that were collected during the active period of operation of plutonium enrichment. We believe that we can use these samples to bound plutonium exposures for the workers on the Calutron operations.

Now it may appear that that's a small number of samples, but we believe relative to the number of people actually working this process that it's a fairly good sampling of the workers particularly in light of the fact that we feel fairly confident it's

consistently been portrayed that the Y-12 facility monitored workers who were preferentially monitored workers who had the highest potential for exposure.

As you see in this table there are zero thorium results available between 1952 and ’57; however, starting in ’58 you’ll see that there are some thorium samples. I believe those are thorium fecal samples that were started to be collected in those time periods as the facility ramped up to do large-scale processing of thorium starting in the 1960s. We believe this is one of the reasons that the cut point is at ’57. We believe these thorium samples can help us bound thorium exposures in that timeframe.

The CEDR data we have, and that’s where all of the urine data came from, and I’ll talk a little bit later about what we’ve done to, or we can get into that later, what we’ve done to -- not the CEDR data, the CER data -- what we’ve done to evaluate the quality and the pedigree of that information.

One important source of information that we have are the health physics progress

reports that were consistently written and available starting in the early days of operation at the facility. And they have some really good descriptions of normal operations as well as off-normal operations including incident exposures. In fact, we believe that this source is an excellent source of information related to reconstructing radionuclides that were produced at the cyclotron operations.

The cyclotron itself was when the targets were primarily, they were clad and the potential for internal exposure was fairly minimal unless there was a rupture of the target itself due to an excessive amperage or something like that or a proton exposure on the target. So those are documented very well, at least the ones that I've looked at and our team has looked at, so that we believe that these incidents, when they occurred, these were not episodic events, they weren't routine exposures and that we can use those to help bracket the potential exposures in the cyclotron operations.

As well as incident reports are

available and we checked in some claimant files that we backtrack and we do have incident reports available. One can look in the health physics report and see the incident and then find that you have incident records in the claimant's file. So we feel comfortable with the fact that we can reconstruct the exposures to these short-lived radionuclides at the cyclotrons.

As far as, let's see, I think I've covered plutonium, uranium --

MR. GRIFFON: Jim, just to interrupt for a second. Are those HP reports on the O drive?

DR. NETON: Yes, they are.

MR. GRIFFON: Okay, those are the same ones that have been, okay.

DR. NETON: There are some that are not there that are available but they are still classified. That's why they aren't available, the information has not necessarily been declassified. But the early time period through 1953, I believe, are there, and we have one from '56. But we do believe we have access to all the health physics progress reports.

MR. GRIFFON: Because I think the ones I've looked at don't discuss as much of the cyclotron operations, at least I don't recall, but anyway, they're on the O drive except if they're still going through declassification.

DR. NETON: Yes, so that covers that.

The thorium I talked about. Oh, there was a neptunium potential for exposure to neptunium. By the way, a lot of this information was really good. You know, we had these great working group discussions and SC&A was very helpful in bringing these all out to the fore.

The neptunium was a result of, the only neptunium exposure potential that I'm aware of was a result of the desire to extract neptunium out of the recycled uranium feed stream to be used as a target to make, I think, Plutonium-238. That was performed on a special column basis made by the X-10 facility, and the material was brought through, deposited on a column -- it was a wet process, taken off, and then sent over to X-10 for processing. So we don't believe that there is a credible exposure scenario,

internal exposure scenario, from that operation to the Y-12 facility people.

I think I've covered most of that. Let me talk a little bit about external. I've mentioned that we have the external badges. We have a fair number of them after '61 that we developed a scaling procedure to go back prior to '61 to fill in unmonitored workers' doses. The neutron exposures at this facility we believe, and it's documented fairly well, to be low.

There is a Report 33 that was written by ORAU for NIOSH that documents that between 1952 and '63 there were only 375 positive quarterly neutron readings for 143 individual workers. And in fact, the exposures on these positive badges during this entire time period was fairly low. I think the 95th percentile of all the positive neutron badged results in that time period is 336 millirem.

There are almost, the only credible exposure to non-monitored, for unmonitored uranium exposure, unmonitored neutron exposures may be in the storage area where enriched uranium was stored. There certainly

was potential for neutron exposures at the cyclotrons and the calibration laboratory, and I think that was the two other locations. There might be one more. But in those facilities it's pretty well established that neutron monitoring did, it was worn.

Starting in '49, neutron-sensitive film was added and exchanged. And workers were assigned these neutron-sensitive films from '50 to '61, but they were not always read. If you worked in an area where there was a potential for neutron, the badge was read. If you did not work in an area where there was potential for exposure, the badge was not read, and in fact, zeros could have been entered into the record.

So it does create a little bit of a confusing picture, but again, the neutron exposures at Y-12 are few and far between. And the documented evidence that we have from the 147 workers that have positives in the ten-year period is the 95th percentile, 330-something millirem.

I think that kind of sums up where we're at with the exposure scenarios. If

you'd like, I can talk a little bit about what was done for the reliability of the dataset.

RELIABILITY OF THE DATASET

MR. GRIFFON: Yeah, I think that would be, yeah, that would make sense and that would go right into the first section of the matrix, too.

DR. NETON: You can probably tell I wasn't prepared to do this ad lib. I'm muddling through it I think okay.

There's an Appendix 1 of the document that's what's called Monitoring Data Sufficiency, and it goes through and lists the available information we have and how we believe it assists us in doing dose reconstructions. The first thing that's discussed are the Y-12 progress reports, and I won't go over that again. I went over that in some detail just a bit ago.

We also looked at employee interviews, and those were done to help support the contention that based on available documentation, that is, procedures and policies, that the highest exposed workers were monitored. The health physics staff

supported that contention through interviews. And in fact, one of the Technical Bulletins that have been written has gone through and demonstrated that based on an analysis of the data, which is included.

As far as the credibility and representativeness of the data a few things were attempted. None of these are exhaustive. There are certain time constraints on us, and the availability of the data was not as great as we would have liked. But we looked at, ORAU and NIOSH looked at a number of different pieces of information to help confirm that the Center for Epidemiologic Research database was indeed, did indeed capture the exposure information for the workers, you know, properly capture it.

What we've done is gone back and looked at the individual external monitoring results that were on data view, the Delta view document image, compared their results to the ones that are on the Y-12 records, electronic records, the CER records. We looked at the health physics progress reports, comparing the numbers of data records present to those in

the electronic record. We actually found in the progress reports monitoring results for 21 specific people, and we compared those. And then there were also these punch cards that were found, about 40 of them, and they were also compared to the electronic record.

Speaking of the urinalysis results, first, the 22 individuals found in a 1952, I think it was, progress report, somewhere in that timeframe -- yeah, I think it was ’52, ’53. The result matched up virtually identically. There were no differences in the results with the exception of one worker who his official record had an additional sample that was left out of the average, apparently left out of the average that was included in the health physics reports. And that value appeared to be an outlier that was retained in the electronic database which made some sense to us. Rather than censoring the database, you know, it was left in there.

I think the situation was that there were three results reported -- I can’t remember the exact results. It was like 157, 152 and a second sample taken on the same day

had a value of 2. Clearly, there's something wrong with one of those values, and that value was not reported in the health physics report. But other than that the data matched identically.

MS. MUNN: That's reassuring.

DR. NETON: Also, the health physics reports did not have a lot of individual data that we could compare. I think those 22 were the only ones we could find at a time available. But they did have a lot of data related to the range of values, the 50th percentile for the period, 75th, 95th percentile, those types of sort of generic statistics.

We've gone back and looked at those, pulling the data off of the health physics graphs, the report graphs, and comparing them to what's, you know, looking at the actual data in the electronic database, there's a table that we put in here, Table 3-2 that shows that there is fairly, pretty good agreement, broad agreement among the ranges reported in the health physics reports and what's in the Y-12 electronic database. There are some discrepancies, but again, we're

pulling these things off of graphs and, we didn't expect them to be perfectly in agreement.

MR. GRIFFON: Jim, this was done for one health physics report or did you do multiple ones and just include one --

DR. NETON: I think this was one health physics report I believe which is number 1952 health physics report. Another test that was done, we looked through the database and where there was a maximum value reported in a specific year, in a 1952 progress report, the maximum value reported is 795 dpm for 24 hours. And in fact, that was the maximum value in the electronic database in that time period. So there was fairly, we would say, good agreement, not perfect agreement, but good agreement between the health physics reports and the Y-12 database.

One area where there was a larger discrepancy, and we talked about this in previous working group meetings, was in the comparison of the actual number of samples reported by monitoring period. Typically, the progress reports identified more samples than

were in the database. But interviews were conducted with laboratory workers who we believe were knowledgeable about operations in those time periods, and it seemed that the health physics reports included more than just the individual results for a worker.

In other words, there were quality control samples, other samples that may have been taken. There's some questions of whether a sample was measured both for uranium, alpha activity as well as fluorometrically. Those kinds of issues were raised which tend to support the findings. You know, there would be more samples in the health physics reports than in the database.

The punch card comparison, after extensive searching we finally found, when I say we I use it in the general sense. I was not involved in this but ORAU certainly did a lot of this work. We learned early on that the data, we couldn't find any laboratory notebooks, but we learned early on that punch cards were used where actual people would write the data, the analyst would write the data on the pre-punched card, which would be

fed into the electronic database.

And after some significant searching we identified a set of cards that were not in the SEC period but were from a later period. I believe it was somewhere in the ‘70s. I can’t recall exactly. And we pulled 36 of those cards that had the numbers written on them and compared them to the records in the electronic database. There was very good agreement with the database with the punch cards as far as the samples having been taken and those types of issues.

Unfortunately, the punch cards did not have a final result. I think that was the result, that was the reason the computer cards were used. They would actually fold in the appropriate background and calibration factors and come up with a result. By applying what we felt to be fairly reasonable values for those factors, we were able to demonstrate that the data from the punch cards was consistent with what was in the electronic database, at least in this 1970’s timeframe.

We do believe that this was, the punch cards go back fairly far, maybe as late, early

as the late ‘40s but certainly into the early ‘50s.

MS. MUNN: This is Wanda. Did I hear you say --

DR. NETON: I’m sorry, Wanda, we’re having trouble hearing you.

MS. MUNN: I’m sorry. I’ll try to get my microphone a little closer to my mouth. Is this better?

DR. NETON: Yeah, a little better.

MS. MUNN: Did I understand you to say that the cards were pre-punched and then the data was written onto them?

DR. NETON: No, I think the data was written on them and then they were punched and read into the computer.

MS. MUNN: Okay, that’s what I would have expected.

DR. NETON: In other words instead of keeping a laboratory list or something, you would write the analytical results in the box on top of the card and then a keypunch operator would go enter the data.

MR. GRIFFON: Jim, I get the impression that only some of them had handwritten values on

them, not --

DR. NETON: That's true.

MR. GRIFFON: -- most of the cards.

DR. NETON: That is true.

MR. GRIFFON: And did, this is sort of getting into our action list, but was there any follow up on the other cards that the idea of comparing the punched values to the database --

DR. NETON: No.

MR. GRIFFON: -- in the time period in question.

DR. NETON: I don't want to speak for ORAU. I'll ask if ORAU has anyone on there that could comment on that. I don't recall, I don't think we've done that.

MR. GRIFFON: I could catch that in the matrix, too, when we go through, but I just was curious, not to interrupt.

DR. NETON: Bill Tankersley, are you on the phone? Was that done at all do you know?

MR. TANKERSLEY: I began to attempt to read the cards, and they certainly could be read, but I think typically for reading the cards was located in another place and, no, I have

not followed up on that. I'm sure that the values can be read.

DR. NETON: Thanks, Bill.

MR. TANKERSLEY: Excuse me one more moment, and by the way, Mark, now, I don't think it's exactly accurate to say that only a few of the cards, all of the cards in that period of time had --

DR. NETON: Bill, could you get a little closer? We're having trouble hearing you.

MR. TANKERSLEY: It's not really accurate to say that only a few of the cards had handwritten data on them. All of the cards in that period of time had the data written on them. They were pre-punched with the person's name and department number and so forth, and then they wrote the data on them (telephonic interruption) in another period that did not have the handwritten data on it. I don't understand that because it was an earlier period, but all of the cards during that '70s, I've forgotten exactly the years that we looked at, but all of them had data written on them.

MR. GRIFFON: Okay, I didn't mean to

misrepresent that. So it was during that time period most of them had or all of them had handwritten data.

MR. TANKERSLEY: Yes, they would all, Mel and them only got, I think, 50 or so of those, and then 14 of those were outside of the period that we looked at the database. That's the reason why there were 36 of them. They were all obviously there.

MR. GRIFFON: But during the petition time frame, or I don't know if you found any cards for the petition time frame?

MR. TANKERSLEY: No, we have not been able to find any prior to, I think, '65.

MR. GRIFFON: Someone's got another conversation going on, I think.

MS. MUNN: Yeah, we have another woman carrying on a conversation with somebody.

MR. GRIFFON: Keep it down or move into another room or something.

MS. MUNN: This is Wanda as just kind of a side comment. I wouldn't even have been surprised to see one set, some of the data recorded in pencil and some not having been one of the individuals who was often involved

in keypunch operations myself.

And that other conversation is still going on.

DR. WADE: This woman who's having a conversation that we can hear, please mute it or end the conversation or in some way spare the rest of us from listening to it.

MS. MUNN: The proficiency of the keypunch operator often had a great deal to do with what information was recorded or not. That may have no bearing on what we're talking about, but it was a reality of that time period.

DR. WADE: Nobody else talk. Let me just hear a word and get her attention. Well, maybe it's gone away.

MR. GRIFFON: I think, Jim, we'll turn it back to you.

DR. NETON: In the external dosimetry area, ORAU could actually look, looking through about a 1,000 Delta view images was able to find a list of 28 individual employees who had at least one positive weekly result in their record so that we could use that to compare to what's in the electronic database. Because as

you remember, some of the, much of the ORAU data in the early years is summary data now. We've lost the individual, you know, we've not lost, individual readings have not been preserved in the electronic database.

So there was a period of 1953 where the weekly Delta view results were compared to the Y-12 electronic database, and I think we talked about this in the past, that's included in Table 3-3 on page 15 of supplement of Appendix 1. And there was in general agreement, but there were differences. But the differences were not to be unexpected because of what was going on with censoring of data as far as detection limits and those type of issues. But again, we believe that they're fairly consistent and predictive, that the database at least captures these people and has their doses of record represented properly.

One thing that's not in here that I just learned yesterday, and at the risk of doing one of these throwing things on the table at the eleventh hour, we have been looking and looking for the, a document that

indicated that the DOE, the Department of Energy had accepted the electronic database as the data of record for Y-12. Well, we haven't found that exact document, but we did identify a document written by Hap West, who was a Y-12 employee, that discusses the fact that the DOE has accepted this database as the doses of record for the workers. So it's one step closer to that, but it's not the Holy Grail so to speak, which would be a DOE memo stating that. But it does support what we've been, what we believe has been the case for this database.

DR. BEHLING: Jim, this is Hans Behling. I need to ask a question that refers to Table 6-2 in your evaluation report. At the bottom --

DR. NETON: What page is that on, Hans?

DR. BEHLING: It's on page 26 and 27. And let me just go to maybe 1954 as an example that's on page 27 at least on my printout. And the question I have is what constitutes a record? You have a footnote A and then there's a statement below that says fix on the monitored records, include all currently known available gamma, beta and neutron data. Does

a record refer to a single monitored individual?

DR. NETON: No, I believe that that refers to in the urinalysis section a number of bioassay samples.

DR. BEHLING: Well, there's also for external radiation which I assume involves the assignment of dosimeters.

DR. NETON: Right, now external is a little different issue because as I mentioned, and someone from the ORAU side correct me if I'm wrong here, but we do not have in many cases the individual readings in the electronic database. They have been consolidated into quarterly results so we would not necessarily have the bi-weekly reads that went in to make that quarterly result.

DR. BEHLING: Well, I guess the question I have if I'm looking at 1954, you have here a total of 1240 records representing 682 monitored individuals. And I guess if I were to believe, for instance, under one condition the definition of a record is one individual dosimeter assigned to one individual person, that would constitutes only two records for

the 680, for each of the 682 individuals monitored. And that's a period of time when people were monitored on a weekly basis or cycles were weekly. Which means that in theory if I was looking at perhaps a complete record for those 682 individuals, I would expect somewhere close to over 35,000 records to make it a complete record. And right now I'm looking at this and saying is this really a representation where only two records on average for each individual was available for reconstructing these doses?

MR. TANKERSLEY: (Inaudible) the year and the quarter of monitoring. They summarized those numbers and those are the official recognized by DOE results. And of course, the CER database is simply a copy thereof, and so what as, the gentleman was, the example that he was referring to, that would indicate that those 600 and some-odd people, they would have two quarterly records for each one and which again is perfectly possible.

Some people would have all four quarters; some people would have one quarter; some people could have two quarters. So the

data and a record is a quarterly external monitoring number even though that number originally may have come from multiple weeks. And that's all been explained and documented perfectly in the health physics reports.

DR. BEHLING: And the reason I say because I'm looking at another TBD. I'll tell you which one. It's Paducah, and I'm looking at the health physics reports there. And what I've come to conclude is really that people were being badged on a rotational basis. And I think this brings us back to the issue of the question that has been raised previously where we, or at least I had mentioned perhaps the concept of cohort badging.

And now I'm beginning to believe that I'm looking at something very differently. In other words, a person among the 682 people may have been monitored during that year but not on a weekly basis. In other words, if you were person number one among the 682, you may have only been monitored out of the 52 weeks that you may have been employed there only a fraction of the number of weeks in total meaning that you really have incomplete

records on individuals.

And therefore, you may have a very different understanding of what the average doses were at least that's been my tentative conclusion regarding Paducah gaseous diffusion plant which also badge people up until 1960 on a sampling basis, and thereafter again all workers were monitored. So there's a real parallel here, and I'm wondering if I'm looking at the same thing here to Y-12.

MR. TANKERSLEY: I can't speak to the records at Paducah, at least not right now, but there's no evidence whatsoever, neither written nor in the records, to indicate there was any kind of random monitoring, and that's what you're suggesting.

DR. BEHLING: Yeah, for Paducah there's no question because I've looked at the health physics reports and then, for instance, I'll give you the numbers for 1953. Supposedly 223 people were monitored, and the assumption is that they were monitored for each and every week. As it turns out I'm looking at the health physics records similar to the ones that you're referring to here. And it turns

out that for some weeks there were only 32 badges issued meaning that clearly that the people were not monitored for each and every consecutive week throughout the whole year. And it's likely that they were monitored on a rotational basis, which completely changes the whole landscape for the dosimetry data that has been assembled in behalf of Paducah. And it's possible that the same thing happened here.

MR. KERR: Isn't the topic of Y-12?

DR. NETON: Yeah, Hans, I hear what you're saying, and I don't know that it's relevant to Y-12. Like Bill spoke, we have no indication that this was the case, and in fact, I would not be surprised if there were certain campaigns going on in the facility where (unintelligible) were being shipped or some operation was being processed where workers would be badged in some periods and not others. That would speak as well to the, you know, monitoring the highest exposed individuals.

DR. BEHLING: Yeah, as I said, I just see a tremendous parallel here between the time

periods during which part of the workers were monitored and then thereafter. And whether it's for Ames, I mean not for Ames, for Iowa Army Ammunition Plant, Y-12, Paducah, the transition between a partial worker monitoring program to all worker monitoring program all came in 1960 and '61. And so there must have been some kind of a AEC policy shift that says we must monitor everyone. And so there does seem to be a parallel between different facilities even though they were run by different contractors.

DR. NETON: All I can say is maybe you have not been on previous working group calls, but we've gone to some lengths to support this conclusion. I mean, we didn't make this up. We heard this originally from interviewing the health physics staff who indicated that this was the case that the highest exposed workers were monitored. We found documentation to support that, and in addition, an analysis was done with when all workers were monitored versus some workers were monitored. And the highest exposed workers continued to be the highest exposed workers. It wasn't like it

shifted. So there's a three-pronged analysis that we've done that we believe supports fairly well that conclusion.

DR. BEHLING: Yeah, I don't doubt that highest potentially exposed people were monitored, but I still believe based on the information I've seen for Paducah and possibly here, too, that people were, in fact, still monitored on a rotational basis meaning that the same worker wasn't always monitored throughout the year.

And that would be consistent with the concept of cohort badging meaning that we want to be sure that no one exceeds the regulatory limit of 300 millirem in any given week or the quarterly or the yearly limit. And the way to do it is to basically monitor on a rotational basis all workers at least for a fraction of the year.

MR. GIBSON: This is Mike Gibson. I just want to make a statement for the record here. As an ex-DOE worker, I can state unequivocally -- I don't know about Y-12 -- but I do know at Mound that the potentially highest exposed worker was not the one that was monitored in

all cases. It was the one that volunteered to wear the dosimeter if they was going to have a limited number of people that were badged or monitored or whatever. So I can't speak for Y-12. I have no knowledge of it, but I can tell you you can't state unilaterally that that was the case complex-wide.

DR. BEHLING: Maybe this is an issue that needs to be resolved on another level other than a conference call, but I will be writing a draft report in behalf of our review of the Paducah TBD. And I will provide some information that supports my contention. Now whether or not this particular issue applies to Y-12 is something that we'll have to look at.

MR. GRIFFON: And I think as it pertains to Y-12, or if it pertains to Y-12, we, the work group or the Board has asked SC&A to review this evaluation report. And if you consider all of the supplemental materials that have been produced through the work group process by, as Jim mentioned, they'll come to a similar conclusion, then we'd appreciate seeing their analysis and your review. I

think that's the place to expand on it.

DR. BEHLING: Yeah, at this point I really just wanted clarification on a definition of what constitutes a record.

MR. KERR: Excuse me; this is George Kerr. We have some memos from Y-12 about who was being monitored and for what periods. Rotational monitoring was not used at Y-12. I can clearly state that. I can clearly state the highest exposed workers were being monitored. They did have what was called a supplemental badge program where they would badge workers for a quarter or two quarters to make sure that they weren't missing any highly exposed workers.

If those workers showed that the head load exposure sometimes in the supplemental badge program, then they didn't monitor them. They switched over; they monitored some other workers. But there was no set rotational badge monitoring at Y-12.

MR. GRIFFON: George, are these memos part of the materials we have?

MR. KERR: Yes, sir.

MR. GRIFFON: They're all out there for our

review.

MR. KERR: They're on the O drive.

DR. MAURO: This is John Mauro. I have a, just a point of clarification so I can understand. Going back to the Table 6-2 that Hans is describing, and we'll use the 1954 data. I just want to make sure I understand now. What we have here is, you have 1,240 records and 682 individuals monitored. The implication being on average, and each of these records represents one quarter as opposed to one week, that means on average any one individual may have been monitored where you have real data for him now for two quarters. And the other two quarters on average again the individual would have no monitored record.

When you reconstruct that individual's exposures for the time periods or the quarters where you have no records, is that when you would apply your extrapolation technique or would you assume a zero reading for that quarter or one-half the MDL?

MR. TANKERSLEY: I'm sorry, John, this is Bill Tankersley again. I think one thing that

you would need to keep in mind is that while I can't argue with the averages that you calculated there, 1200 is very close to twice what 600 is, but that's not really the picture that one sees. One sees that typically a group of people have four quarters of monitoring because they are the regular workers, the workers in one of the areas that have a high potential for exposure. And then there'll be another set of people that will have, you know, will be monitored for one quarter or two quarters and so forth as the need arises for these short-term, some of the projects were very short termed, and they would need to wear a badge for those periods.

DR. MAURO: And for an individual worker that situation would be apparent so in that circumstance for the quarter that that person was monitored, of course, you have his record. And for those quarters that that person was not monitored you would deal with that on a case-by-case basis based on that individual's work history. I just want to understand how you fill in the missing data for that individual whether you assume it's zero or you

use your extrapolation technique.

MR. TANKERSLEY: I cannot answer that. The dose reconstruction people, maybe Jim can address that.

(no response)

MR. TANKERSLEY: Since they are not, our contention is that a person that is not monitored for a quarter or a longer period --

DR. NETON: I'm sorry, Bill, it certainly wouldn't be zero, and I'm at a loss. I don't have the procedures in front of me, but I assume that we would either impute the value based on the back extrapolation or --

MR. SMITH: Jim, this is Matt Smith in Richland. And you're absolutely correct. We would follow Implementation Guide 001 which we do not have dosimetry data bound the hierarchy which includes coworker data which is the data that George Kerr and Company has put together in OTIB-0013 and also in Procedure 42.

DR. BEHLING: And this is Hans Behling again. I guess the bottom line of my line questioning really centers around the table that's identified in TIB-0013 that says how did these numbers come to be in light of the

fact that you may have people who were monitored but not for all cycles of the year. How did these numbers that are found in TIB-0013 that now constitute the basis for cohort dose assignment, how were those numbers derived? And that's really the bottom line of my question.

MR. SMITH: Well, again I'll turn you toward George Kerr, but they wrote up, recorded the report 32. Is that correct, George?

MR. KERR: Yes, and we handed out something at the last meeting in Cincinnati that was a progress report that very clearly tells you how we got those numbers in the beta and gamma regression analysis. It's very clear in there what we did.

MR. SMITH: And I also see it now in this SEC report as well. It's in the report and, or the attachments rather. So I believe the story's there.

DR. NETON: Right, and I believe SC&A did an analysis of those 147 workers a month or more ago and the report that I read based on urinalysis didn't indicate any real issues I didn't think.

DR. BEHLING: Well, Jim, this is Hans again. We didn't approach it from that point of view. We just looked at the continuity between pre- and post-'61 as a timeframe for those 147. We never really looked at the issue as we're discussing it right now.

DR. NETON: Right, but then the most recent reincarnation was last time when we were discussing whether how could all those people have zeros, and that was the argument against this highest worker being badged. And I think we discussed that and put that issue to bed by indicating that a lot of the people were monitored for potential exposure to beta activity, not gamma activity.

DR. BEHLING: Yeah, in fact, I was the person who wrote that memo that you are referring to. On the other hand, I also look at the beta-gamma ratio, and in truth, when you look at the MDL values for beta and gamma, if you have a zero gamma, you have close to zero beta as well so the two really go hand-in-hand.

MR. GRIFFON: I think, again, I think there's several issues here, and I think some

of those reports that were provided I'm not sure that SC&A completely reviewed them. But I'm assuming in your review of this evaluation report, you'll roll up any outstanding issues on this topic.

I mean, I'm listening here, Jim, and one thing that I'm thinking of, you know, just assuming that taking the position that the highest exposed individual was monitored, some things that have been said raised the question in my mind about sort of dilution of the distribution. You know, that there were these supplemental people badged and that data is in there, but when you add all this data in together, you know, what is your distribution representative of?

Your distribution is also based on quarterly results, and those quarterly may well be 13 weeks, but then maybe one week for an individual I guess is what I'm hearing. So interpreting that, that coworker distribution, I think is more, you know, may not even now be down to a question of what the most highly exposed person monitored but rather just how is the coworker model being interpreted and

used for filling in the blanks for people without data?

DR. NETON: I think there was some conscious effort on our part to fit these 147 workers. I'm sure George Kerr would agree to that. These were not randomly selected folks. I don't know. I wasn't prepared to go down this whole path again or I would have re-read all those reports.

MR. GRIFFON: I also think you've provided a lot of, you know, you've given us those reports, and I think we ought to re-examine those is what I'm saying.

MR. KERR: Let me make a comment, please. This is George Kerr. We very carefully went in and selected 147 workers who had significant amounts of monitoring data to do the regression, and obviously, if these people had a lot of records, they were, had some highest exposures to gammas. So this wasn't going in and just selecting people at random. And also we did the beta regression. We went in and selected a set of people who had a significant number of orders of beta exposure data. And that was what we were looking for

to do in regression analysis. We think this is a claimant-favorable estimate for the population as a whole. For the people it doesn't provide a claimant favorable, there are ways to scale the data up to make it claimant favorable. So I don't see how we missed anything important in here.

DR. NETON: Everyone needs to go back and refresh their memory I suppose on what these reports have, but I do think that they are fairly good scientific treatments of the issue. And I don't know that we have the kind of holes that are being suggested at this point.

DR. MAURO: This is John Mauro. I think --

MR. GRIFFON: I think it's more clarification, Jim, than suggesting that there's holes, but anyway, go ahead, John.

DR. MAURO: Jim and Mark, this is John Mauro. Jim, I agree, you folks have invested a tremendous amount of research and analysis. I was party to the last meeting. You provided us with a great deal of material and a lot to think about. We have all that material, and I think really the ball is in our court now to

digest it and to convince ourselves that, in fact, of the virtue of your position. But we do need to, we're still looking at it. And I presume at some point we will be asked to prepare our findings and observations regarding this matter that we will deliver in draft form to the working group.

DR. NETON: I appreciate that, John. I guess what I'm asking at this late juncture though is that when analyses are done, they don't come sort of out of left field and say this could have been like Paducah but point specifically into why the technical analyses, and there's hundreds and hundreds of pages that we've put together, are incorrect or inappropriate. Because otherwise then we end up just re-issuing the document again and saying, well, here's where we addressed this. So it would be great for us if we would, you would couch these discussions in the context of what we have out there in addition to what you might have found yourself. But if you follow my --

DR. MAURO: Jim, I agree with you a hundred percent. We will do the best we can to

crystallize places where, if there are areas where we disagree, the basis for that disagreement, we will try to make it as clear as possible so to put the working group and the Board into a position to appreciate exactly where we agree to disagree, and then, of course, somehow that might need to be resolved. I'm not saying that's where we're going to come out on this, but we're going to do our best to try to put a nice clean boundary around areas where we agree, on areas where we disagree and why so that the Board will be in a good position to make a judgment.

DR. NETON: That's fair enough, John.

MR. GRIFFON: Jim, can I --

DR. NETON: I just wanted one more question though. At one point we had come to the conclusion that whether the highest exposed worker was badged or not, which we still believe is a solid position, that it was really a matter of whether you picked the 50th or the 95th percentile, the distribution applied to unmonitored workers.

MR. GRIFFON: I was just actually going to offer the same. That it may at the end of the

day being a site profile issue more than a, you know, a --

DR. NETON: Well, right, so if that's the case, we've got a lot of other issues to deal with.

MR. GRIFFON: I think, my sense, Jim, is that you've provided plenty of analysis on this topic and at this point it's in SC&A's court. And we have asked them to do a review of this evaluation report. And the evaluation report references those analyses. So that's part of the process, they have to review. And I think we wait for their final product on that.

DR. NETON: Right, is this an SEC issue or not?

MR. GRIFFON: And if they, I would assume, John, that if you look at this and you still have some certain concerns, but you say, however, I mean, certainly, it's within their purview to say however, we don't believe it's an SEC issue. We believe it could, a dose could still be calculated, et cetera, et cetera. So I think that could be handled that way and SC&A's write up if appropriate.

MS. MUNN: This is Wanda. I thought we had sort of put that to bed, and that it was going to be considered a site profile issue. Perhaps I misunderstood what the discussion, where the discussion was going earlier.

DR. MAURO: This is John Mauro. I would take responsibility for the situation we're in right now. At our last meeting, conference call, I did make a very sincere statement that in my opinion we were dealing with a site profile issue. However, I also apologize to the working group because by no means did I mean to pre-empt the working group and its judgment regarding this matter. And so as a result of that I have made my opinion known, but I think we certainly need to put our material in our report, our recommendations and findings to the working group, and of course, ultimately it will be the working group's judgment as to whether or not, not withstanding the outcome of this debate, whether or not there's a debate here that has any relevance to the SEC.

MS. MUNN: Oh, yeah, I didn't feel you were pre-empting anything, John. It was just my

understanding from the previous discussion was that we had sort of --

MR. GRIFFON: My sense was, at least from the action standpoint, I did leave that one open kind of, Wanda. I do remember John's point, and I think we were kind of leaning that way, but we also at the last conference call had just received that lengthy addendum that George put together for us. And I thought it was a little hasty to just, you know, I think I was trying to give SC&A a little more time to assure themselves of the position on that so I left it open at this point. But I think it does have to be wrapped up in the final review and if it's not, you know, if it's a site profile issue, it should be stated that way in your review, John, you know, if there's still some concerns but you believe they're fully or clearly not SEC issues then I think you should state that so that we don't have to consider it in these deliberations over the SEC petition.

MS. MUNN: I guess I did misunderstand then what your position was, Mark. I guess I am concerned about the time constraints we have

here. And I guess the issue in my mind now is how soon the working group can resolve this particular point so that we can get it before, we can get our final comments before the Board for their action. Do you, what are we looking at in time here?

MR. GRIFFON: That's a good question. I would, I think we really do need a review of this evaluation report by SC&A prior to the Board, you know, to the work group prior to bringing this to the Board for full deliberation and consideration, but I'm not sure --

MS. MUNN: We need for us to be able to do this in Denver.

MR. GRIFFON: Yeah, I know, and looking at the clock I'm not sure what this means, but John, do you have any sense of how long --

DR. MAURO: Yeah, I was giving some thought to that. My main concern is the example problems. That is, we certainly have had an opportunity to read the evaluation report, and we understand it. But as we read it we also realize that the evaluation report reads very much like a road map. To issue making cross-

reference to a number of sections of the site profiles, to many OTIBs.

And in the end the rubber meets the road with the example problems. And it was our intention to go through the example problems and go through the roadmap so to speak and say, okay, I see how they're dealing with the exotic radionuclides. Oh, yes, I see exactly how they plan to use the data for back extrapolation in this particular example, the neutrons, et cetera, et cetera.

And it looks like that there are six cases, where I'm going with all this is I think it's very important that SC&A go through the example cases and come to our own sense that, yes, it looks like they not only have written up an evaluation report that addresses all the issues, they've also provided us with examples demonstrating that, yes, in fact, they can reconstruct the doses and address all the issues that were at play. That last part, going through the example problems, I'm not quite sure how time consuming that's going to be. Quite frankly, I'm going to sort of put Hans on the spot.

Hans, as you know, has been leading up all of what I call the case reviews. And for all intents and purposes what we're talking about is reviewing six cases.

MR. GRIFFON: Not quite though, I think these are not full DRs in that sense, so you're looking at theoretical DRs I think.

Jim, am I correct in that?

DR. NETON: Yeah, that's right, Mark.

MR. GRIFFON: You're looking at proof of principle for certain aspects of the dose reconstruction.

DR. NETON: These are much, I don't want to say simpler, but more basic than a dose reconstruction. A proof of principle is the right term.

MR. GRIFFON: And I don't think it's a matter of cross-walking with the original records and all that time consuming stuff done in a normal audit.

DR. NETON: That's correct, but there will be some interpretation required when one says we use -- and Hans is probably in the best position to make that determination. We, you know, assign the triangular distribution per

this procedure. And that's some of the stuff that's in those examples that I provided last night.

MR. GRIFFON: Yeah, I don't want to underestimate the time consumed.

DR. MAURO: I hear what you're saying, Jim, and I agree. In other words what you're saying is we don't really have to match every number. What we need to do is to convince ourselves that you have in place a protocol that will allow you to get to a number and that that protocol, in fact, is based on data and assumptions and models that seem reasonable without actually going that extra yard and actually matching the number. So I agree, the evaluation of your case is probably is a simpler process than a typical audit of cases.

DR. NETON: One thing I might caution you though is that we, the ones that we put over were really ones that are proof of principle that we can do dose reconstructions that are plausibly bounding. In other words we, you know, for dose reconstructions as far as SEC determinations go, we have to be able to

demonstrate that we can bound the upper limit, but we also are aware that that upper limit has to be a plausible number.

And that's really what we tried to put out there, and, you know, I'd appreciate feedback on it if they're not hitting the mark. I know they came out fairly late in the game, and I apologize for that, but we're open for discussion on these. And maybe that's where us, SC&A and NIOSH, can work together to get these examples fine-tuned in a quicker fashion.

MR. GRIFFON: Given all this, John, and the time we have, I mean my hope was that we could get a review from --

DR. WADE: Mark just went away. Mark, there's an awful lot of static on your end.

MS. MUNN: It's unhearable. I'm assuming that's Mark's phone.

DR. WADE: Maybe they'll take steps to rectify the problem. Mark, we can't hear you. Let's give him a minute.

MS. MUNN: Give him time to get to another phone.

DR. WADE: Yeah, I think it's happened

before. He's recognized it and come back to us.

Are you back with us, Mark?

MS. MUNN: My hope is he's hung that one up and gone to another phone to call back in.

DR. WADE: Well, who's on the line? Mike, are you still there?

MR. GIBSON: Yeah, I'm still here.

DR. WADE: And Wanda, you're there. Let's give Mark a minute just as he was about to say something profound.

MS. MUNN: In the interim, John, thank you for sending the, that dose reconstruction example.

DR. MAURO: Okay, thank you. I had only had five, I believe, but we've been talking about six, so I may have missed one.

MR. GRIFFON: Hi, it's me back again. I've got to pay the phone bill. My portable went dead there. I hope I didn't blow everybody out with the static.

Well, I don't know what was said, but I was hoping that SC&A could provide a review before the next meeting, at least maybe a day or two. To be fair I think that's the best we

can expect, given it's about two weeks away.

DR. MAURO: Yeah, Mark, let me say this. We're going to hit this with everything we have, the Y-12 cases. And what we will do is we will start moving through each of the cases and the issues that are in play, and we will stay in continual touch with you as we move through the process. It may turn out we can move through it expeditiously and deliver a report or at least some findings and observations regarding these matters to the working group, and we could even hold some discussions before the meeting.

But I hate to make that type of commitment because we haven't even looked at the example problems yet. But we will be doing that immediately and we will say within a matter of a day or two we should be in a better position to start to let you know how our position's going to be by the time we're ready for the meeting on the 24th.

DR. MAKHIJANI: This is Arjun. I have a question about the dose reconstructions and the maximum plausible doses which is I kind of quickly scrolled through the Word documents

summarizing the dose reconstructions at the break, and I didn't see that there was a discussion in any of them -- I might easily have missed it -- of how this overlaps with the proposed class. Whether these workers, for instance, in the number five case which is a uranium dose reconstruction and the person was in 92-12, what you do about potential thorium exposure at, how does the uranium and thorium exposure overlap?

DR. NETON: Well, Arjun, you might have missed it, but we're proposing to add workers who were exposed to thorium to this class so we're not doing thorium exposures.

DR. MAKHIJANI: No, no, no, I understand that. The, no, but I guess I don't know how to ask the question right. If the class consists of people who are thorium workers, who were, presumably who were dealing present in these buildings and some of them were also exposed to uranium or they were maintenance workers. I don't understand how you deal with the overlap. Who's in the class?

DR. NETON: That's two kinds of questions. I think depending on, I guess, the view point,

we believe we can do uranium dose reconstructions for all workers. That's our position at least. Now how a thorium worker gets added is a little more problematic and that's an SEC class definition issue, but one, we'd have to establish that these people worked in those buildings and had the potential to be exposed to thorium.

We don't necessarily make that determination from our end. We are in the position of defining what we cannot reconstruct. And that's where we ended up. But we will reconstruct all uranium exposures for anyone who has not been determined to be a thorium worker.

DR. MAURO: This is a good discussion. Let me, let's say we're going through the examples, and we say, okay, we agree that this example demonstrates the methodology for reconstructing the doses to uranium or some internal emitter, other internal emitter or an external exposure. But let's say we're talking about a real person now. But we have no way of knowing whether this real person that we're looking at did, in fact, was, in

fact, exposed to any thorium.

And so in a funny sort of way our review of your cases may very well come out something like this. Yes, we see the approach you've done. We believe you can reconstruct the doses to exposures to uranium or many of these other radionuclides that we've been talking about. But we don't know whether or not this particular worker was exposed to any thorium. And so we really can't say whether or not the reconstruction for that worker is complete. How do we deal with that?

DR. NETON: I'm not sure, John. I mean, is Larry Elliott on the phone?

MR. ELLIOTT: I am on the phone.

DR. NETON: Larry, can you help me out here because it's my understanding that we don't make the determination.

MR. ELLIOTT: That's right, this is an aspect of development of a claim that Department of Labor conducts as they do for a congressionally established SEC sites, and we have vetted our definitions on the Y-12, Rocky Flats and the Ames with the Department of Labor. And they have commented that they

understand the definitions as proposed and feel that they can have the wherewithal to develop the claims to put the people in the class or find them not to be included in the class.

MR. GIBSON: Larry, this is Mike Gibson. So if I could just try to understand what you're saying. On page 11 of the evaluation report for Y-12 there's a Table 4.1, Y-12 claims submitted for thorium, Y-12 claims submitted, and it says '96. Is that all the workers that have filed claims or is that only the workers that I guess you're saying DOL thinks --

MR. ELLIOTT: Four point one and the '96 total claims that you see listed in that table are claims that we have in our possession here at NIOSH for dose reconstruction that have time in the class period.

DR. NETON: Larry, can I help you out a little bit though? I think what's happened is this table is in error actually. That number was for the original class petitioned by --

MR. ELLIOTT: Oh, that the petitioner submitted?

DR. NETON: Yeah, and so in reality that

table should be revised to include what we're calling now our proposed class. So I apologize for that error, but I noticed that this morning and meant to point it out.

MR. ELLIOTT: I didn't catch that either, but the footnote calls for the time period of the class.

DR. NETON: It's the right time period and everything but --

MR. ELLIOTT: But be that as it may, you know, the numbers that would be in this table if they were correct would only be the claims that we know we have in our hands that have an identified timeframe subject to the class definition. We do not have the ability here to develop the basis for whether a claim would have the right cancer type, latency and duration of exposure or duration of time in the class period to be included in the SEC class.

MR. GIBSON: This is Mike again. So it's, it is limited to those that you think meet the criteria, not the total number that are submitted or have filed claims?

MR. ELLIOTT: Once we get this table right,

whatever that number will be, will be for the claims who have time in the period of the class.

DR. NETON: I can put a little light on that. We believe that there are about 850 people that have time in that class. Well, not in the thorium class, but in the total people who have worked between in the SEC time period that were not already eligible based on the first, you know, the initial Y-12 SEC. So there would be about 850 total claimants eligible for cases, eligible to be considered as thorium workers I think is the way.

MR. ELLIOTT: And to take that further then the Department of Labor will take those claims. We give the Department of Labor a full list of those claims, and they would then develop whether that individual claim was a thorium worker or not.

MR. GIBSON: This is Mike Gibson again just as a follow up. So I'm still just trying to determine how you make the definition, you know, for instance are you including maintenance workers? Because they usually typically rove all over the plant. So I mean,

are they included in that or --

DR. NETON: If the maintenance worker was monitored or should have monitored for exposure to thorium, yes.

MR. ELLIOTT: If the maintenance worker frequented these buildings listed in the definition and should have been monitored or was monitored for thorium, yes, they would be in the class.

MR. GIBSON: So are there records in the database to show which buildings they worked in or --

MR. ELLIOTT: Well, your question goes to the way that DOL develops the eligibility of a claim for the class, but I can't speak to that although I know that other than I know they use affidavits; they use records that are available to them to assess whether the individual claim fits into the class. Our basis, our evaluation report is to provide a scientific basis on whether or not we can conduct dose reconstruction to a sufficient level of accuracy and whether or not then, if not, was health endangered. That's what we're required to do, and that's what we've

attempted to do in this evaluation report.

MR. GIBSON: Right, I understand that, Larry. This is Mike again. I'm just saying I'm trying to determine how you or how DOL determines if people should have been monitored for thorium. That's all I'm saying.

MR. ELLIOTT: Well, I don't know if Jeff can help us out if he's still on the phone. But they do this for the existing congressional SECs which have similar language, should have been monitored or were monitored.

MR. GIBSON: Okay, and I'm not trying to be argumentative --

MR. ELLIOTT: No, I understand.

MR. GIBSON: I'm just saying to be claimant friendly and I know you can only go just back and get the records you can get, but it's just if they don't exist, you know, it just doesn't seem, I don't know. Is Jeff Kotsch on the line? Could he speak to this issue?

DR. WADE: Either Jeff isn't on the line or doesn't wish to speak to that. Again, you're asking an excellent question, and at a minimum we'll ask our colleagues at DOL to come to the Board meeting prepared to answer this

question. Again, by statute this is not the NIOSH responsibility. It is the DOL responsibility, and it would be, I think, wrong for us to try and categorize how they do this. The best thing for us to do is to invite them to come and brief the Board in a complete way as to how they would go about this activity.

MR. GIBSON: Okay, thank you, Lew.

MR. GRIFFON: Although to me, I mean, just to follow up on Mike's line of questioning, I mean I think to me this seems like I don't know that there are any, there's no job title, thorium worker, at Y-12.

DR. NETON: Yeah, I don't think, Mark, that this intent is to call someone a thorium worker. I think really --

MR. GRIFFON: Yeah, but I'm just wondering if, you know, does DOL have enough information to make this decision or does it, it would, I think, count on NIOSH for some process information on those various buildings and those kind of things.

DR. NETON: Those all have to be worked out. I think you're right, but I think the intent

here is that if, you know, to segregate out people who have potential for exposure to thorium versus someone who may have set a foot in the building at one point to deliver a piece of paper, I mean, one has to make some cut points here, and how Labor does that, I think Lew's right. They need to speak for themselves, but --

MR. GIBSON: This is Mike again. Did I cut you off, Jim? I'm sorry.

DR. NETON: No, no, that's fine.

MR. GIBSON: I wasn't just limiting this to thorium, I was just getting to the in general for any radioisotope which I think is the intendance of the act is exposure to any isotopes so I don't want it to be defined as I was just asking the question strictly about thorium, you know, it's DOL or whoever makes this decision. How do they base it on exposure or unmonitored exposure to any isotope?

DR. WADE: I'll see that we make the request of our colleagues at DOL to come in and brief the Board on this. Thank you, I think it's a pertinent discussion. I don't think it's one

we can have the closure here, but I think it's excellent that it was brought up. And we'll work to see that there is information shared with you. I mean, if NIOSH is in a position to do its job, and that's what NIOSH is presenting, what happens once that job is done falls to another agency and we need to be sure you understand that.

DR. MAKHIJANI: Dr. Wade, this is Arjun Makhijani. So I presume that by the time a case come to NIOSH one assumes that they were not exposed to thorium in that period because everybody else, the thorium-exposed people have been already taken out of the consideration or --

DR. NETON: Fundamentally, that's correct, Arjun, except that we already have many of the cases here. What will happen is the Department of Labor will re-evaluate all the cases that they sent to us and make a determination of which ones we don't need to proceed with dose reconstructions.

DR. WADE: Yeah, depending on how the decision is made, once it's made there'll be an awful lot of activity that we'll have to

happen to implement that decision. And we'll attempt to brief you thoroughly, brief the Board thoroughly on that at the next meeting. In a way your decision is sort of independent of that. Again, you have a responsibility to act upon the proposal as it's brought to you if your consideration in your opinion needs to be informed based upon what DOL has to say. Then we'll see that you have that information.

MR. GIBSON: This is Mike again though, you know, not trying to belabor this, but just if NIOSH gets the records and DOL makes the determination and then turns around and comes back to NIOSH, it's almost like a criteria setup that would make an SEC impossible.

MR. ELLIOTT: This is Larry. DOL does not come back to us for this kind of development, and they're not seeking that job categories or titles that we think fit into this class or that we don't fit into this class.

MR. GIBSON: Right, I understand that, but I mean you guys have the records, and then you have a dialogue with DOL and then they come back to you. And it just, in the back and forth it just seems like it could basically

sabotage a legitimate SEC petition or criteria if that makes sense.

MR. ELLIOTT: I guess your point's lost on me. Certainly, if we have any records here that speak to types of workers, job categories, process information, rosters of individuals who frequented buildings, we would give that to DOL to help them make their determination and make the developments as we have done in the past. But I guess I'm not clearly understanding the point you're trying to make.

And I'm not trying to be argumentative. I just want you to understand that when it comes to responsibilities, this is one that the Department of Labor takes seriously, and it's their responsibility to follow up on it. As Lew mentioned we'll make sure that DOL is at the Board meeting to provide an elucidative answer here.

DR. WADE: Maybe just as brief background, Larry, I mean the issues of employment and where an individual worked, those have always been DOL judgments, not NIOSH judgments.

MR. ELLIOTT: That's correct, and when, for

example, when we identify additional employment history in our development of work histories, we transmit that information back to DOL with the claimant's knowledge and understanding that their claim will include the additional employment history that we have found. So the same would be true as we work with DOL on moving claims through these different classes that are being added to the special exposure cohort.

DR. WADE: I'm sorry this is complex. It is to us as well. But again, we'll see that, to the degree we can make it happen, as clear an explanation as possible is provided to you at the next Board meeting.

MR. ELLIOTT: I mean, Mike or anybody, if you'll look at the congressional-designated classes to the SEC, you'll see similar wording, were monitored or should have been monitored. And DOL evidently from that, from the genesis of this program have developed ways and means to place people in those classes based upon that language.

MR. GIBSON: But right, I understand that, but -- this is Mike Gibson again. But it's

based on the data that NIOSH has that they give to DOL to develop their opinion, right? So --

MR. ELLIOTT: If we have data, we give it to them, but not in all cases do we have data that aids them in developing a claim fit into the class.

MR. GIBSON: Okay, well, yeah, I think that's kind of my point. The determinations are based on data that's available to you.

MR. ELLIOTT: No, not in all cases.

DR. MAKHIJANI: Larry, this is Arjun. I have a different kind of question. I mean in the congressional-designated SEC classes, or instance, if you take Paducah, the existence and who worked, I mean, most workers worked with recycled uranium. And you know, they were monitored for uranium so there was an overlap of the missing piece of information with the existing piece of information. In this case thorium was not the prominent material being processed. And as you found, there appear to be essentially no personal data that have been located, no monitoring. So no one was monitored in the period in

question. So since it was a minor radionuclide whose extent of processing doesn't seem to be very clear except that Mel Chew said it was hundreds of kilograms, and probably there's a document to that effect, it seems a little bit more complicated and difficult --

MR. ELLIOTT: Yes, I understand, and you are correct. I'm sure it will be more complicated and difficult than what DOL applies in the congressional classes that were so designated. But I think you will, you know, once DOL can relate to you how they do this development work, you know, for Paducah I know that there are secretaries or administrative or clerical folks that they exclude that they send to us for dose reconstruction because those people were not viewed as someone who had a job that should have been monitored.

DR. WADE: Okay, well, this is a complex issue, but it's an issue really of the relative responsibilities at the different agencies. NIOSH's judgment here is to evaluate whether or not doses can be reconstructed consistent with the language of

the rule, and that's a judgment we make. How the administrative decisions to implement that really fall with DOL, and we need to bring DOL to the table to explain that to you so that you can be again aware of that as you make your progress.

MR. GIBSON: Lew, this is Mike again. If I've got you right they'll be ready hopefully, I know you can't speak for them, but what at least I would like, I can't speak for the Board, the definition of exposure is to any type of radionuclide, not just thorium or plutonium or whatever.

DR. WADE: I understand that. I mean, what I'll ask them to do is to just come, send someone knowledgeable who can come and talk to us, explain to us, to you, how they go about making these judgments, the generic approach. And again, I can't promise that'll happen. It is certainly something I'll set out to do on your behalf. But again, it's not that we understand this crystal clear and you don't. I mean, this is, again, in this program every time we turn a corner we discover, we are into new territory and now we are again. And we

need to make this as clear as we can to you as you go forward.

MR. GIBSON: Okay, yeah, thanks.

DR. WADE: Yeah, thank you.

MR. GRIFFON: Right, Jim, at this point are you, you pretty much went through the approach, right, in the evaluation report?

DR. NETON: Right. I'd just like to add one more thing though. It was all really good discussion. I think the discussion was precipitated by John and I think Arjun wanting clarification whether they needed to look at these examples in light of the fact of can we do thorium for these workers.

And I think what I'm hearing is that the answer is no at this point. I mean, we're defining the class as thorium workers and then that falls under the Department of Labor. So I just want to make sure. I think, I hope we're all on that same page. That's what I'm understanding anyways.

MR. GRIFFON: I think if I were in John's, I think I would advise John to put that, you know, we assume that the thorium was not considered here and take that up as a separate

discussion.

DR. MAURO: Yeah, my understanding is we're off the hook on that one. And we will just look at the issues that are before us and thorium is not one of the issues that we need to look at.

DR. NETON: Right, okay, I just wanted to make sure that we were all on that same page.

Okay, Mark, I pretty much outlined the approaches for where we're, what we're doing and --

MR. GRIFFON: What I was going to suggest is maybe to quickly go through the matrix and then get into the sample DRs if that makes sense. And I don't know if people want to take a break first or if this would be a good time for Ray to get, I mean, if people want a five-minute break and then start into the matrix and the samples?

DR. WADE: Seems reasonable.

MR. SMITH: Before you go on a break this is Matt Smith in Richland. I am going to ask one of our staff, Steve Reed (ph), who is a dose reconstructor on these to try to call in for this part of the meeting for any external

dosimetry that may come up.

DR. NETON: That's fine, Matt.

MR. GRIFFON: And I'm hoping the matrix section will only take a half hour or so. I think we've hit on a lot of the points already.

DR. NETON: I think you're right.

MR. GRIFFON: Go through for purposes of completeness.

MS. MUNN: We were down to very few items that --

MR. GRIFFON: Yeah, I highlighted in yellow so I hope we can skip through this matrix fairly quickly. So let's maybe reconvene at 3:00 p.m. eastern.

DR. WADE: Thank you.

MS. MUNN: I'm going to stay on the line.

(Whereupon, a break was taken from 2:55 to 3:00 p.m.)

MR. GRIFFON: Why don't we start. I'm sure Mike will be on in a second.

MATRIX DISCUSSION

I was going to say just to go through the matrix fairly quickly hopefully. And looking down the first item I have is item

number two, and I think that this is all rolled into Appendix 1, your response to this, right, Jim?

DR. NETON: That's correct.

MS. MUNN: There was a point, I was of the impression that they were covered and this is now good to go, incorrect?

MR. GRIFFON: Well, I think that that's your final deliverable on that item I believe, yeah. That's what I would say. I think you've responded to all the questions and requests in that area.

DR. NETON: Correct, given the timeframe available to us we've done as good a job as we're going to get at this point, and it's unlikely to change.

MR. GRIFFON: Right, okay, item three is similar. I think it's also in that appendix. Now there's no further information on logbooks. Any more being done on the punch card data, Jim?

DR. NETON: No, I think you heard Bill Tankersley say that he was going to but time did not allow for him to look at the punch cards. I think that this calls for us to look

at, so I tried to identify punch cards in the SEC period and we just have not been able to do that.

MR. GRIFFON: But there's nothing, you know, like work in progress. It didn't sound like it.

DR. NETON: No, I think at this point we've, you know, our report stands as it is.

MR. GRIFFON: And then item six, we might want to slightly amend that to say that you have this Hap West report, correct?

DR. NETON: Correct. I will get that on the O drive as soon as possible.

MR. TANKERSLEY: Is that that document now resides on the O drive?

DR. NETON: Bill, it's actually on your O drive, but not the one that I can access. So we need to get together and figure out where it goes. If you send it to me, I'll put it out where I know I can, I've been doing it.

MR. GRIFFON: Bill will have to take care of that.

DR. NETON: Yeah, that's fine. We'll get it out there.

MS. MUNN: Can we just amend that statement

a little bit to say could locate only secondary documentation? It's not the primary letter.

MR. GRIFFON: Yeah, secondary document, they did identify secondary documentation indicating that this was the case, okay.

Moving on down, if anybody ever, or has any input, stop me along the way here, but I'm down to item 1-b, number two. I had added to this that NIOSH will provide the methodology in how data will be used for dose reconstructions. And this was for these exotics for lack of a better term.

DR. NETON: And we still owe that as a deliverable under the, I felt that we would cover that in the example dose reconstructions.

MR. GRIFFON: That's what I assumed.

DR. NETON: There was a number 11 and, I believe, a number 12. One spoke to exotics, and one spoke to, I think, thorium and plutonium and other nuclides. And we need to get those out.

MR. GRIFFON: And then 2-b, this question of uranium enveloped, the Delta view uranium.

Did we see analysis on that? I thought, Jim, that you were going to provide us with something on that. I may be wrong on that.

DR. NETON: You know, Mark, my mind's a little fuzzy on that. I know that we discussed this at the last working group meeting, and Bill Tankersley, I think, spoke to an analysis, but I don't remember if we handed it out or not.

Bill, can you help me out?

MR. TANKERSLEY: Sure, and we did send that, you know, the highest number in the -- I've forgotten now. There's a 700 or so such uranium data in the Delta view image file and the highest number I think is 330 or something like that. And so the conclusion is that the Y-12 electronic database, of course, bounds the data, the uranium data that are in the Delta view system.

DR. NETON: Well, this is a little more than that, Bill. I thought that we were, and I thought that we had done an analysis to demonstrate that if the Delta view uranium data were incorporated into the coworker model, there would be no net effect on the

coworker model. And intuitively it kind of made sense because there's only, what, 6,000 samples in Delta view versus literally hundreds of thousands in the coworker, and I thought that someone had done that analysis. We talked about it at the last meeting.

MR. GRIFFON: Although the Delta view data tended to be skewed toward those early years when --

DR. NETON: I think that my recollection was that the Delta view data were almost all zeros. Remember, we had this discussion, and --

MR. GRIFFON: Maybe this is just a small follow up, but may be something. It seems, I mean I don't disagree with what Bill just said and what you said. Maybe just to close the loop on that.

DR. NETON: I must have dreamt this, but I thought we had an analysis that we discussed. We'll follow up and make sure.

MR. GRIFFON: I don't recall. If it's out there, then just let us know and we'll --

DR. NETON: I've been dreaming a lot lately.

MR. TANKERSLEY: Well, we could certainly do

that very easy, Jim, but nothing like that has been done. If I understand you correctly, you're saying to integrate those limited number of Delta view data into the Y-12 dataset and see if it skews the percentiles or whatever. That's easily done, but nothing like that has been done.

DR. NETON: Yes, and I don't think, Bill, we need to go as far as incorporating it into the major database. I think if we just took some summary statistics on the Delta view and demonstrated that it was either consistent with or provided lower values than the coworkers data that were used then we'd be okay. And my judgment, and maybe that's where I dreamt this, that with all those zeros it certainly wouldn't be skewing in a bias high direction.

MR. GRIFFON: I agree, Jim, just for purposes of closure.

DR. NETON: Absolutely, we'll make sure we close that loop.

MR. GRIFFON: Number three I had that NISOH will provide a (inaudible) to be used for dose reconstruction for these radionuclides, and

maybe again this is in sample DRs?

MS. MUNN: That's my interpretation.

MR. GRIFFON: I think so. Is that correct, Jim?

MS. MUNN: I thought that was what we asked for. That we asked for them. Hello, Jim?

DR. NETON: Oh, I'm sorry I had it on mute. Yes, I agree, but some of these probably won't be covered though. For example, I discussed neptunium early on and one could make a value judgment whether we're on target with that or not but --

MR. GRIFFON: It's something for obvious reasons won't be covered, right?

DR. NETON: Right, but the key one in my mind on this list is the plutonium exposures, possibly the polonium. We did discuss the U-233 alpha could be bracketed using the uranium gross, the uranium measurements.

DR. MAKHIJANI: Jim, could I ask a question about the U-233?

DR. NETON: Yes.

DR. MAKHIJANI: Would that mean that you'd be assuming that things were U-233 instead of U-234 the way you usually do?

DR. NETON: If it was activity, alpha activity, we would just assume it was U-233. Although I'm not sure about the daughters of U-233. Let's see, that would indicate a Thorium-229.

We were just having a sidebar conversation. Liz Brackett is reminding me that the dose conversion factors are almost the same for U-234 and 233. Although does not U-233 indicate a Thorium-229? I forgot. It might. Thorium-229's got a lot of daughters, but it might have a high enough half-life where it wouldn't create much Thorium-229.

MR. GRIFFON: Either way you'll take the conservative approach, right?

DR. NETON: Sure, if the dose conversion factors were higher because of Thorium-229 in gross which I'm not sure it does, we would certainly make that adjustment. If they were almost identical, then it wouldn't really even matter for us in the dose reconstruction to segregate out a U-233 exposure from a normal uranium alpha exposure.

MR. GRIFFON: Any other comments on that?

MS. MUNN: We taking the position that the

examples then do cover that outstanding issue?

MR. GRIFFON: That's what I'm noting, Jim. Is that accurate?

DR. NETON: That's, yes, I hope.

MR. GRIFFON: Now I'm down to number five, and I just wanted to make sure I had this correct, Jim. I put NIOSH indicated that the final model to be used is in the latest site profile document, for recycled uranium this is.

DR. NETON: Right, our intent there was that the write up that's in the last version of the site profile is what we would use. And that we could not identify a credible scenario that would concentrate the individual radionuclides above their arrival mixture. Outside of the neptunium, it was intentionally pulled off our ion exchange column.

So in other words it was not an enrichment plant so there were no traps or anything as such that might have been present at places like Paducah or whatever. And so we're applying those ratios. I think we added one more piece to the evaluation report that talks about the Paducah feed plant ash issue

that was raised by SC&A in, I think it was example seven.

And you'll find in our example write up there that rather than do a dose reconstruction for number seven, we provided a brief one-page write up as to why we felt that there was no exposure scenario that we could determine for the Paducah feed plant ash since it wasn't processed at Y-12.

DR. MAKHIJANI: Jim, I took a brief look at that at the break, and I presume that there is some documentation saying that these plants were never opened and so on.

DR. NETON: Well, I can't guarantee that's true, Arjun. We need to look into that. Bryce Rich is on the phone I believe.

MR. RICH: Yes, that's true. There are some, a few references there. It's not extensive but enough to convince that there was no processing of the Paducah ash at Y-12.

DR. MAKHIJANI: Yeah, no, no, I understand the no processing. I was just wondering regarding the repackaging and so on.

MR. RICH: There was none of that there. It delivered, I think as a reference indicates,

in metal containers. And as near as we can determine by inventories, I believe I understand nine metric tons could have been on site.

Can I go back to the U-233 just for clarification?

DR. NETON: Sure.

MR. RICH: The Uranium-233 process only encompassed just a few months, consisted of just a few kilograms, and was conducted in a lockbox environment, and coupled with the dose conversion would be essentially equivalent to 234 and appeared to be, addressed that.

MR. GRIFFON: All right, I think I'm down to item 1-a in the external. And looking at item three, I deleted the phrase more discussion is needed on this topic. I think we've discussed this already and SC&A is going to look at this issue in the evaluation. It's fully incorporated into the evaluation report as it stands.

Is that correct, Jim?

DR. NETON: I agree with that.

MR. GRIFFON: And I think SC&A will capture that in the review of the evaluation report.

Number four, this was, oh, this was, I think you had finished up in Appendix 1 the section where you showed 1953 data, Delta view data.

DR. NETON: Right.

MR. GRIFFON: However, we did indicate that in 1951 there was this question about a discrepancy between the Delta view and CER database, and I think you were going to follow up on that and also other raw records. I think you indicated in the last phone call that you had found some cards related to computer entries of some of external exposures. And I don't know if you were going to pursue that any further or what was done with that.

DR. NETON: I'm pretty sure we haven't pursued that any further at this point. Again, time constraints came into play. I don't, we don't -- Bill Tankersley or someone at ORAU's side has an update on this. We have not been able to put this issue, to advance this issue any further.

MR. TANKERSLEY: Well, this is Bill Tankersley. Very quickly and very briefly, we

had nothing to compare original data to in the electronic database in 1950 and ’51. There are a number of records in there as Mark has pointed out, but they’re all zeros, and we don’t have an explanation for that. We feel like the regression analysis model would be applicable at times.

The third point there, none of us have any -- and it must be a misunderstanding or a missed communication -- none of us here have any recollection of any punch cards for external data. I don’t remember any.

MR. GRIFFON: Okay, maybe I dreamt that one, Jim, I don’t know. I thought I heard, maybe I was thinking about the urine punch cards, but there was no, I will take your word on that. I could have easily...

I guess the question on the 1951 records is, you know, in your evaluation report you present the ’53 and the fact that it does compare very well. But in ’51 it was all zeros in the raw data or all zeros in the database, and the Delta view data clearly had a number of positive values. I mean not any shocking values, but in the hundreds of

millirem.

DR. NETON: Were those pocket dosimeter results?

MR. GRIFFON: No, no, no, there were pocket dosimeter results, too, but there were film badge measurements.

DR. NETON: I recall having this conversation, and we just have not had time to go and put that issue to bed.

DR. MAKHIJANI: I may be a little bit at fault here. I have some Delta view database image numbers that I think I said I would pass on to you, and somehow at the end of the meeting I did not. I will send you an e-mail today.

MR. TANKERSLEY: Not necessary because we have the Delta view data in a database here, and Mark, you're absolutely right. There are some film badge data in the Delta view system for at least '51 I think. I'm not sure about '50, but again, there's really, we don't know of anything to do because the values that are in this electronic database are all zeros except for I think there's one positive value in 1950.

As I remember, and we really have been doing a lot of things, I think I checked the number of people who were monitored, in other words, who have IDs in those earlier years in the electronic database against some numbers that are said to be monitored in the HP reports and they came out very close. We did also do a very nice analysis, George and I, on the records in 1959. They had a very nice table where they had the number of people in ranges zero to one, one to two, on up, I think, up to 13 rem. And those numbers compared to what's in the electronic database were virtually perfect.

MR. GRIFFON: Right, right, I guess this goes to just the fact that just because the results are not the way, don't support your case doesn't mean you don't include them in an analysis of the reliability.

MR. KERR: Mark, the one thing you have to be careful in that '51 data is a lot of the people who are listed on those sheets are X-10 employees.

MR. GRIFFON: That might be one way to take --

MR. KERR: There are a lot of them, and on the first few sheets in the Delta view, the X-10 people are not necessarily identified. As you get over on some of the later sheets, they start to identify the X-10 people. So what you've got to sort of do is go back and highlight the X-10 people on the earlier sheets to really identify them. And once you do that, you find out that I think the preponderance of people on those sheets are X-10.

MR. GRIFFON: Well, that may be, George, I guess that's what I asked for. If that --

MR. KERR: That doesn't account for the complete discrepancy, but that takes care of a sizeable portion of it.

MR. GRIFFON: It may, yeah, and if it does, that would be great if that was written up, and that could very well explain the difference or most of the differences anyway.

MS. MUNN: Is there anything in this discussion that I have missed that would lead us to anything other than a feeling of comfort with respect to how the CER database is used?

MR. GRIFFON: Well, all I'm trying to do, I

guess what I'm trying to get at, Wanda, is you've got very little raw data at all to compare for the external. I think they've got a fair amount that they've looked at for the internal. And you've got, right now I see one piece in 1953 from Delta view. And I think that it's kind of sparse so to the extent we can expand on that it would at least support the case further.

MS. MUNN: So what you're asking for really is just essentially what we've discussed here right now, assurance that there is a reason for the discrepancy?

MR. GRIFFON: Right, or just, yeah, if they can cross-walk that and say these were all X-10 people or all but one of them was X-10, and therefore, some very minor discrepancy, then that would take care of it.

DR. NETON: Let me make sure, Bill Tankersley, you said you know where these records are located? We don't necessarily need Arjun's file?

MR. TANKERSLEY: Not necessary at all because those data we have put in in a real database. He's welcome to --

DR. NETON: No, no, that's fine, I just want to make sure that we were aware we're speaking of the same records, and I hear Mark pretty clearly here. We need to take a look at this to the extent we can, and then in the next few days, and try to address this issue.

MS. MUNN: And put the right words somewhere.

DR. NETON: Right, I'm not sure where the words are going to go, but we will be prepared to at least comment on what we were able to do or not able to do, to accomplish.

MR. GRIFFON: And then number 4-a.

DR. MAKHIJANI: Mark, before you move on, there's sort of a point here that may be important as a question which is that in the evaluation report, and I think also maybe elsewhere -- I read too many documents I think -- the processes when you back extrapolate the '48 and '49, I think you say that the processes were the same as the early '50s. And I think in the TBD or TIB-0029 or some place you say that they were the same up to 1951.

So it seems to me that there were so

few people externally monitored in 1950 and ’51, 148 and 184, and since the processes seem to have changed in ’52, this question would seem to be kind of rather in important in terms of how you can handle the data since the later data might not be applicable to the ’50, ’51, ’40 and ’49 periods. At least that’s how I read your evaluation report. Maybe I didn’t read it right.

DR. NETON: I didn’t catch all of what you were saying, Arjun, but I think what we’ve done is we’ve taken the 1951 data and went back into ’40, ’49 and Liz Brackett is telling me that she assumed that the (unintelligible) occurred in ’48. What that would imply is that these were 1951 data for a 1948 and ’49 intake which would really jack up those intakes substantially.

DR. MAKHIJANI: No, no, I’m not questioning the method in terms of internal dose at this time. I just am trying to understand what’s happening in regard to the verification of the external dose records here in that there weren’t many people who were monitored in ’50 and ’51, and even fewer in 1949. And so since

the processes changed in ’52 that would also presumably affect the external dose question.

And I notice that Dr. Kerr started his external dose analysis only in 1951. It seems like it’s important as a technical issue in terms of processes and job types to have this 1950, ’51 external dose data with some confidence as to what it was.

DR. NETON: I’m missing, I guess, the point because we, George Kerr started in 1960 with the external data and extrapolated backwards --

DR. MAKHIJANI: I’m not talking about the 147, I’m talking about the number of workers, the charts in the Kerr paper handed out in February then revised version in March that showed the number of people monitored. Dr. Kerr will know exactly figures one and two that I’m referring to that showed the cumulative personnel doses as well as the individual doses and the persons monitored. That analysis started in 1951, right?

MR. KERR: Yeah, I’m here. I just tried to get together some stuff. We found out when we did it, histograms and quartile plots that we

had trouble fitting anything to the external data. We're talking about distributions of any sort. Quarterly data before the third quarter 1956 did not fit a lognormal or any other commonly used statistical distribution.

And there were several reasons for the lack of fit. Prior to the third quarter of '56 where one the small size of the monitored populations, the frequent exchange of the film badge dosimeters, and the methods of assigning dose if the measured dose was less than the limit of detection. So that's why we did, selected out that group to do our regression analysis. So anything back past '56 is based on a regression analysis not based on the actual doses to the population of monitored workers.

And that's because of the problems we had with that early data because sometimes they used zeros instead of the LOD, sometimes they assigned as much dose as 50 to someone whose measurement was between the LODC. You get these strange distributions that are hard to deal with. So we went ahead and did the regression analysis to get us back to the

earlier days which is based on these populations that are well defined, we know who the workers were that were in them.

Now the thing we did do is Bill and I and Janice Watkins went back and looked at external radiation monitoring at the Y-12 facility during the ’48, ’49 period. That data is not part of the CER database. It’s not electronically available.

MR. TANKERSLEY: Yes, it is.

MR. KERR: Okay, it’s electronically available.

MR. TANKERSLEY: It’s not included in.

MR. KERR: What’s the problem with that, Bill? It’s in a different format.

MR. TANKERSLEY: This is that 11,000 record, approximately 11,000 record set of data that I’ve mentioned several times before. They were on the cards, the original cards. As a matter of fact I just looked at those again earlier this week.

MR. GRIFFON: That’s what I was talking about, cards.

MR. TANKERSLEY: Yeah, I thought about that, Mark. That’s what you were talking about,

yes. And they have film badge results, open window shielded and also a chamber data. And those data are in the electronic database since the format, you know, there were two different chunks of data and the formats are different. They're not attached to the main Y-12 database, but they are available. I know that they're available on the O drive. They were set up there, like I say, a year or so ago. But they do, they are perfectly matched because we input them.

MR. KERR: The thing is we went back and looked at these separately, and all backward extrapolations show that our estimates for '48, '49 are extremely claimant favorable compared to the actual doses measured in '48 and '49.

MR. TANKERSLEY: The data's available in TIB -- let's see what it's number -- 0047.

DR. MAKHIJANI: I guess I have not seen any of the actual data for '48 and '49. There is the '50, '51 data in the CER database, but --

MR. TANKERSLEY: We put that on the O drive so anyone who was interested could look at it.

MR. KERR: Wallace made that available, like

I say, months and months ago. And Arjun, the reason why you probably haven't seen it is, as I said, it is not in the same file as the '50 to '88 set. And then of course we do have data after that. But generally speaking what we work with is that large 600,000 record file that goes from 1950 to 1988. That set of data I assure you is available on the O drive.

DR. MAKHIJANI: Oh, no, I'm not disbelieving you, I just, I haven't seen it and the oversight is surely mine.

MR. GRIFFON: Jim, can you try to get that onto the AB review? You know, that section that we have dedicated?

DR. NETON: Sure.

MR. GRIFFON: Just so we don't stumble around looking for it or whatever.

MR. KERR: Yeah, that's the part that would be useful.

DR. NETON: Are you talking about the '48, '49 external data?

Bill, you know what file they're talking about, right?

MR. TANKERSLEY: I know perfectly, and by the way now go ahead and answer the question.

Are some of the folks wanting to see copies of the original data?

MR. GRIFFON: Is that the database that file, Bill, or is that data? What is that file you're talking about?

MR. TANKERSLEY: Those are cards, Mark. They're not the IBM cards. I don't think they were using them in the late '40s. This is the, everybody can speak for themselves here, but this is the more or less square card that has the punches all the way around it where the metal rod can pull out certain cards. And they have the names and the data. As I said, we used to own the original cards, but years and years ago they were returned to the Record Center, I believe, and then they subsequently ended up over at the Y-12 record center. As I said, I literally looked at them on back Monday of this week, I think. We may have copies of them, and I know I can get copies of them, at least some of them.

MR. GRIFFON: I think probably whatever you have posted now on the O drive is what we need.

DR. NETON: Bill, if you send me the

location where they are on the site research database, I will make sure I put them in the AB Document Review folder.

MR. TANKERSLEY: Ten-four.

MR. GRIFFON: Okay, and are we on to item number 4-a then. I think that is just what Bill's talking about there. And I'm not sure that those cards that I was speaking of before, because he says they're from the earlier time period, I don't think they would be useful in looking at the CER external database reliability for purposes of '50 to '88 or whatever, obviously. So that point, I sort of missed the time period on those cards. So I think that action item will go away, number 4-a. Am I right about that, everybody?

MS. MUNN: Yes.

MR. GRIFFON: I'm not hearing anything. All right, and then I'm down to 2-a-1. Just points of closure again, Jim, item 2, I don't know. You spoke of this several times but the criticality, I think you said you had a write up on that. Did you? I don't recall whether that was ever --

DR. NETON: I thought I provided it, but I

will, I will make sure that if it's not on the O drive of the AB Document Review folder, it's there. It's a draft document that Bill --

MR. GRIFFON: SC&A, do you recall if you've seen this or I may have missed this.

MR. FITZGERALD: I think it was a handout at the last meeting.

DR. NETON: Well, I'm not sure. It would have been a fairly thick document, but there is really only one section is relevant that speaks to what the exposure conditions were prior to the criticality accident. That is, that the tanks had been all, they thought they were clean and the linings were empty and that sort of thing, and of course, they were wrong.

And that addresses the issue as to why a number of those workers were not monitored when one would think if there was a criticality, you would have uranium there, you should have been monitored. And there's about two or three pages, if I recall, that are relevant, and I may just put those pages out there. The rest of it is really sort of criticality response and evaluation of the doses, et cetera. I'll do that.

MS. MUNN: We did see something at the last meeting on that. I can't remember.

MR. FITZGERALD: Yeah, I think it was a few pages. It may have just been an excerpt of the one you're talking about.

DR. NETON: That sounds like the document, but I'll make sure it's available on the O drive and people can look at it.

MR. GRIFFON: Now I'm down to item, well, three and four kind of go together. I left them this way because it was, in the last matrix it was this way. But three was NIOSH will provide this addendum, and they did. And four was SC&A will review it. And I just edited it, number four, to say that SC&A will review and provide comments on these reports in the context of the SEC petition review. Because I think these reports are included, and so I don't expect a separate deliverable on this. John, if you're, I think this would all be part of your --

DR. MAURO: Yeah, that'll make it a little easier for us. We can take care of it when we deliver our report.

MR. GRIFFON: And number five was addressed

as far as the assembly worker question went?

DR. NETON: Yes.

MR. GRIFFON: Then 2-b-1, I'm not sure, was item 1 completed?

DR. NETON: I thought it was because we did see comments from SC&A, but there were really, but the main issue that we discussed was the evidence or existence of very low-energy neutrons. At the working group meeting we asserted that we could not find any mechanism or moderator in the process areas where there's very small diameter piping and very small quantities of uranium going through it to moderate the neutrons down to such a low energy. And I thought that SC&A had agreed that that was acceptable.

MR. FITZGERALD: Well, I think the way it was left, this is Joe Fitzgerald. I think I agree with you, Jim. I think the way it was left was that was the, certainly, the assertion that certainly there was no evidence or examples of sources of moderation in the plant. And I think it was sort of inferred that unless we could identify such sources of moderation, then that's pretty much where

things would stand.

DR. MAKHIJANI: This is Arjun, Jim. I agree that we left it there, but then you puzzled me again because in your dose reconstructions, either number one or number three, you say the worker, John Doe, was exposed to low, medium and high energy neutrons. I got very confused by that.

DR. NETON: Let's strike out low. I think that was a carryover from the request from SC&A that we do that, and yes, strike that out.

MR. GRIFFON: That sounds familiar because it was requested, and you commented on that before.

DR. NETON: We commented, and then we just accidentally left in low.

DR. MAKHIJANI: Okay, fine, so it was just kind of an oversight.

DR. NETON: Yes.

MR. GRIFFON: So one is completed and if it's going to be considered at all, it'll be considered in the petition review or in the sample DRs, I assume.

NIOSH will -- number two -- NIOSH will

provide a newly developed model for beta exposure.

DR. NETON: Yeah, the model, the write up is in the evaluation report for the beta distributions. They're there, and in fact, George Kerr distributed at the last working group meeting a write up on betas. And we do have one example dose reconstruction that we still owe you, which would reconstruct the dose for beta, an unmonitored worker exposed to beta activity. I think even further beta activity that is extremity exposure.

So you can certainly review what's in the evaluation report in Appendix 1, and then we will have a sort of proof of principle example which I have on my computer. I just got it a little too late to make it available to the working group and will put that out there shortly.

MR. GRIFFON: All right, and I think that's it. That brings us to the sample DRs. Unless there's any other questions on the matrix, I guess I'll turn it over to Jim and let you step us through some of the examples.

MS. MUNN: That leaves us with essentially

four relatively minor items on the matrix to be documented somewhere, right?

MR. GRIFFON: Right, I didn't count, Wanda, but a lot of things were deferred to sort of the review of the full evaluation report, right?

MS. MUNN: Right.

MR. GRIFFON: Yeah, and a couple small items just to wrap up. We have nothing hanging out there, no. That's for sure.

MS. MUNN: The big reports are.

SAMPLE DOSE RECONSTRUCTIONS

MR. GRIFFON: All right, Jim.

DR. NETON: What we have in these example dose reconstructions are sort of a modified version of what was requested. And if you remember SC&A put out sort of a straw man document that said here's eleven potential dose reconstructions you might be interested in seeing. But they also allowed for the fact that some of these might be combined and some we might want to review and look at and determine the relevancy, that sort of thing.

Where we ended up at the end of the day, we think that we have not eleven, but --

let's see, how many do we have here? About nine dose reconstructions that document what we believe to be at least proof of principle for being able to bound exposures and yet have those exposures be in a plausible range. They're not coming up with doses that just wouldn't make sense. And so these are somewhat modified from the original SC&A request, and I'll try to point out why where it might be relevant.

The first one had to do with trying to assign a neutron dose assessment to a hypothetical machinist operator. And I should point out none of these are real cases with the exception, I think, of number three, and that's been pretty, there's no Privacy Act information to my knowledge in there. This hypothetical machinist operator who was exposed to -- and scratch low to a medium neutrons. And the idea was that he may have worked in the cyclotron areas and maybe industrial X-ray units.

So what was reconstructed here was the dose to the prostate for this individual who had an employment history starting in 1948 and

ending in 1957. We ended all of our evaluations at the end of the SEC class period just for convenience purposes because we were trying to focus in on the issues relevant to the report.

And what you'll see here is that the person was assumed to have no dosimetry data between 1948 and '56, that is, no monitoring data whatsoever. But he was monitored in 1957 with summary data only. That is, all we know is he had 100 millirem deep, 150 millirem shallow, and a neutron result of zero.

Now we're in a little bit of a dilemma with these type of examples because as I indicated at the beginning when I was summarizing the evaluation report, it is our opinion that in the cyclotron area workers were monitored. I mean, we have pretty good documentation that they were required to be monitored so it would be almost impossible for a person working in the cyclotron area to not have any monitoring data at all.

That being the case though using our efficiency approaches, we went ahead and made some broad stroke assumptions. That is, we

assumed he was actually unmonitored and assigned him coworker dose based on the models, scaling models, that we've talked about for photons. That is, the backward extrapolation into the 1948 to '56 timeframe and assign the person photon dose using that technique.

And then his monitored dose in '57 -- and by the way, whoever was doing these dose reconstructions correctly because I'm interpreting these, but I think I've got it. We used the monitoring data in '57, but we assigned, I believe, missed dose assuming all that material, all that exposure was delivered in one badge exchange. So that increased the person's exposure in a claimant favorable fashion.

And then the neutron dose gets a little bit more difficult. Again, we find it almost no credible scenario where a person could have been working in certain areas and not have neutron values. I mentioned that after about 1950 the NTA film was in the workers' badges. They made a determination to read them or not depending on their potential

for exposure.

The most credible scenario we could envision that this person could have been exposed to was working in the storage area with enriched uranium that had a one-to-one neutron-to-photon ratio. But based on the imputed dose using the photon dose based on the back extrapolation technique, one assumes, one arrives at a neutron dose that could have been there.

Given all that and adding it up, and I won't get into some of the summaries of radiation types, et cetera. You can read that on your own. The first ended up with a total reconstructed photon dose of 6.9 rem and a neutron dose of 10.2 rem. And even under these assumptions which are fairly claimant favorable, the PC is under 22 percent.

So that's the first one. Are there any questions or ...

(no response)

DR. NETON: Okay, let's move on then?

MR. GRIFFON: Sure, yeah.

DR. NETON: Case number two was something that we didn't do because I think that it

passed for us to reconstruct exposures to low-energy neutrons, and we just again, you know, are of the opinion that we couldn't come up with a plausible exposure scenario for that type of situation.

Case number three tried to elucidate how we would do neutron dose assignments when the doses were zero, actually zero in the record. And if you remember, if a person was monitored, they were all monitored for neutrons, but it's possible that zeros were entered in there even if the badge had not been read.

Again, we have a similar situation where a person was unmonitored, the cancer reconstructed here would be the prostate, assumed employment start date '50, ended in '57. Again, this was a cyclotron worker, no monitoring between 1950 and '54, monitored for neutrons and photons from '55 to '57 with summary data only.

Now, this says use worker number 51. That's case 51, and that's not a claimant number or anything, that's just a sequentially assigned number. In Appendix A-2 they used

his exposure scenario to do this dose reconstruction. In a very analogous manner this early dose was reconstructed in ’50 to ’54 using the coworker approach. Again, we believe that a person working in the cyclotron would have had his badges read, but nonetheless we went ahead and assigned these zeros as real. And I’m looking here as to how we -- we assumed -- I have to go back here and look at this narrative for a second.

We used the coworker, this dose was reconstructed from ’50-’54 because the photon -- I’m drawing a blank. Can someone help me out here from the ORAU side as to what we did for the neutron exposures on this person?

(no response)

MR. GRIFFON: You’re on your own.

DR. NETON: I’m on my own.

MR. KERR: Are you looking for the neutron exposures?

DR. NETON: Yeah, what did we do for the neutron exposure in the 1950 to ’54 period?

MR. REED: This is Steve Reed. I just jumped in here, and I’m trying to figure it out myself. I did the dose reconstruction,

but I did many of these, and I haven't looked at this one for quite some time.

DR. NETON: I'm trying to see what ... Missed dose was not assigned separately because the period ...

MR. KERR: Yeah, I don't think I assigned any missed dose for '50 to '54 because there were no --

DR. NETON: What neutron dose was assigned in '50 to '54? That's what I'm trying to figure out here.

MR. KERR: Well, from '50 to '54 the neutron dose was based on the model photon doses because that's, we used coworker data for those years.

DR. NETON: Correct, but what ratio did we use here for neutron to photon? I don't see that.

MR. KERR: A one-to-one ratio which isn't evident in this dose reconstruction.

DR. NETON: Right, that's why I was drawing a blank. I didn't see that in here.

MR. KERR: We used the 9212 Building assumption which is the one-to-one.

DR. NETON: Okay, that's the same assumption

that what was used in the previous dose reconstruction. The photon dose was reconstructed, and then the neutron dose was used based on the enriched uranium storage area ratios and assigned for ’50 to ’54. And then when one gets to the period where he was monitored for neutrons and photons from ’55 to ’57, it was essentially a missed dose calculation assuming, I think, that all of the results, all of the dose was received in one badge exchange. And knowing the badge exchange frequency in that period, that this dose was added for each of the missing, potential missing reads. And that ended up assigning a 20.5 rem total dose.

By the way, I don’t take credit for the fact that we can read these figures, but in dose reconstructions we get down to the millirem because oftentimes claimants like to see it down to the millirem level. But the missed photon dose was three-and-a-half. The photon dose as reconstructed was 5.8, neutron dose was 7.5, and missed neutron dose was 3.7. Given the total deep dose was 20.5 rem, the PC for this case ended up being about 18.2

percent.

DR. MAURO: Excuse me, Jim. This is John. Given that we're going to be in an expedited process to be using this material to sort of track closure on the issues, would it be acceptable to the working group for us to be able to interact directly with the authors of these example dose reconstructions?

MS. MUNN: I think it's desirable.

MR. GRIFFON: Yeah, I don't have a problem with that. I think that's appropriate, yeah.

DR. MAURO: That would be great. That being the case if the names of each of the authors or the principle authors could be provided, we could get this going aggressively.

DR. NETON: I might want to be a little careful there, John. The authors of dose reconstructions are fine. I think we could interact, but it would be good if we all could have, I don't know how to put this, but support people working with them because to be fair to the dose reconstructors. You know, they're doing these based on emerging issues that occur at these working group meetings. And to the extent they can, they're using very

standard principles and procedures. But in some cases, and I'll point to the extremity dose issue, we've had to work very closely with them.

MR. GRIFFON: I guess from the worker group standpoint I think it's appropriate for you to directly work through Jim on this. How you get the author on the line, that's up to, you know, you guys can work that out, but it can be an informal interaction I guess is what, John, what mainly what you're looking for, right?

DR. MAURO: Exactly, the reason is that it's been our experience very often a large portion of our time when we look at cases is just trying to figure out, get the path that was followed, the assumptions, because sometimes all of the assumptions are not there and it takes a little digging. If we could just go directly to the source that could expedite things.

DR. NETON: I think we could certainly set that up, but I guess if you'd work that through me that would he helpful. I guess I'd just like to be in the loop and in the know as

to what's transpiring.

DR. MAKHIJANI: John, this is Arjun. You know the way Jim and I, I think if I might speak for us, Jim, worked pretty efficiently before on some of this where we had e-mail interchanges on these kind of detailed technical questions and we just published the e-mail so everybody was in the know about what happened. And still I did not feel constrained in any way in our communication.

Did you, Jim?

DR. NETON: No, I think that worked fine.

DR. MAKHIJANI: I think it went very easily and was also very transparent so maybe we could just in this case we could have the names then Jim and that principle author would be part of the e-mail exchange which is documented and get the questions answered.

MR. GRIFFON: That's fine, Arjun, but I don't want to constrain you in any way. If you need to pick up the phone and say I'm looking at this right now. I've got this page open and, you know.

DR. MAKHIJANI: Yeah, I agree, but time is very, very short so I think John is right. We

have, even though it seemed like a crunch then, I think we have much more time.

DR. NETON: Yeah, I think, Arjun, I like your proposal, and what might work best if you just sent it on to me, and I'll make sure that the right people are touched on the ORAU side. Because then you certainly would have the dose reconstructor involved, but like I said, there are other folks who are working closely with the dose reconstructors to make sure we're representing the current state of our evolution of this process. And that's totally acceptable to us that we work that way. And if it gets to the point where an e-mail exchange gets fairly cumbersome and we're writing pages, then we could facilitate some kind of a phone call with minutes as we've done in the past.

MR. GRIFFON: Yeah, that was my point.

MS. MUNN: The crunches do seem to get crunchier as time goes on, don't they?

DR. NETON: Yes, they do.

Okay, any more comments or should I move on?

(no response)

DR. NETON: The case number four we have in the works, and I need to provide that to you, that is the extremity dose assignment for betas that applies to that coworker model that George Kerr developed. And we'll get you that as soon as possible.

Case number five puts us in the realm of uranium dose assessments, and this would be a hypothetical machinist. I think these were hypothetical. But the example machinist operator exposed to enriched uranium, if this person worked around enriched uranium in say Building 9212, 9988, again, we're not accounting for any thorium here at all because we feel we're only reconstructing doses that we feel that we can. This dose was reconstructed to the --

MR. GRIFFON: Just one more thing on the thorium. I know we've beat this around awhile, but the only thing that I guess I get concerned about because I, you know, in reading this in preparation for the phone call that's the one obvious thing that stuck out is how are you going to narrow that population. And I'm concerned now that by defining it the

way we are, I'm worried, and I guess we have to wait for DOL's response to this, but I'm worried that we're defining a class that can't be administered. That DOL will not have enough information to make a determination of who was or was not thorium workers, and we're sort of setting up a failed process here.

That's, this is a little aside here, but I guess again we best, Lew's going to follow up with DOL and it may be more of a policy-type question. But I mean, just to get that into the record. I mean I think we --

DR. NETON: I don't disagree with you. I mean we need to hear Labor's input on this.

DR. WADE: I think Mike made the point very clear before, and it's on the record, and we'll try and work through it.

MR. GRIFFON: Okay.

MS. MUNN: One's first thought reading this evaluation is it's going to turn out to be an awful lot of people, a high percentage, I think.

MR. GRIFFON: Yeah, and I hate to put an unresolvable problem in the hands of DOL. That's the other question.

DR. NETON: Right, this is going to be sort of a consistent issue I think though because we, just to claim that we're going to add a class or a bunch of workers, we're going to have to almost acknowledge up front we know almost nothing about them other than there was a large amount, enough material there to expose them and there were. It seems like if we knew a lot more we would probably be able to do something.

MR. GRIFFON: And on the flip side, if we get into this situation where DOL requires proof from the individual that they worked in that building and worked with thorium, I don't know how an individual provides that either. I guess I get worried. I guess Mike stated it very well. We're going to follow up --

MR. GIBSON: This is Mike. I'm sorry, I didn't mean to cut you off, Mark.

The lack of records it seems, I know SEC kind of turns around the burden of proof back on the government, but the lack of records also, you know, to the claimant is their defense.

MR. GRIFFON: Right, then to prove that you

were quote/unquote a thorium worker, I mean, it's one thing to prove that you worked at Paducah for 250 days, but it's another thing to prove that you were a thorium worker in 9212, especially if you're, it's a survivor claim and they would have no knowledge of exactly what they were doing in those buildings. So it might --

DR. WADE: We understand. I mean just for the record, if Larry's on the phone, prior to releasing the evaluation report we took the proposed class definition to DOL. So we had discussion with the belief that they felt they could administer this, but we need to bring them to you to talk about it.

MR. ELLIOTT: Yeah, that is correct, Lew, as part of the process of making sure that we can administer with DOL developing cases that fit into the class, they understand the definition that we're proposing and recommending. And just for clarity's sake and for the record there, in our discussions with DOL there was no indication that there was a requirement that a worker or burden be placed on a worker to indicate or prove that they were working

with thorium. The definition of the class specifies that thorium exposure existed in those buildings; and therefore, as I understand DOL's policy and procedures, they would just need to put people in those buildings.

MR. GRIFFON: How we generally do this. I mean, maybe not even specifically for this petition, but at least tell us what they can about their policies and procedures with regard to placing the -- I guess I don't want to be in a position of recommending something that can't be administered.

DR. WADE: It could well be the Board, based upon what it hears from DOL, might temper its judgment on the evaluation report. And that's quite reasonable.

MR. GRIFFON: I'm sorry to sidetrack on that issue again. I just --

DR. WADE: Now, well as I said in this program, and I'm relatively new to it, I mean, there's always some new vexing issue. But if we get the right people in front of the Board, and the Board hears what they have to say, and then I trust the Board to make the appropriate

judgment.

MS. MUNN: It is a vexing issue. It's unfortunate that we have absolutely no thorium data, but then given the period that we're looking at and the reality of life at that time, it's not really astonishing. It's just unfortunate.

MR. GRIFFON: Okay, but as far as reviewing this sample DR, I think what we're asking SC&A to do is consider this as a uranium case and not look at the potential thorium exposures at all.

MS. MUNN: That's what I heard.

MR. GRIFFON: Okay, Jim, I'm sorry to cut in there.

DR. NETON: Okay, so this is a machinist operator working in an enriched uranium area who developed colon cancer hypothetically and his employment period was from '48 to 1950. This, I think, was SC&A's attempt to say well, what are you doing in that era when you have no bioassay data. I think the original one talked about only fluorometric data. In fact, we don't even acknowledge we have (inaudible). It might have been a couple samples, but we're

really not using those at all in the early time period.

So this is a case where he was monitored for, he didn't have any urinalysis data except he had one result apparently we decided in 1950 in this case. So what we did was we assumed, we used a coworker model that went back into the early period, 1948 through 1950 to estimate this person's dose. And it turned out that using that model, one comes up with a fairly substantial intake of like three-and-a-half microcuries, somewhere thereabout. It's just a large intake projected for that time period.

Type-S was used again as our normal policy was to go through and take the solubility class that is the most claimant favorable if we don't know what the exposure was to. And we used Type-S, 100 percent Uranium-234 was used as normal in these cases because that tends to maximize the dose because it's got the highest alpha energy.

And doing that and modeling one positive sample in there as well, sort of superimposing one acute intake on top of this

chronic exposure scenario, we ended up with a PC of 5.6 percent for the colon which is I think you're going to see is fairly typical for non-metabolic organs that are exposed to uranium.

I mean, if the organs are non-metabolic, I mean, the organ does not concentrate the uranium to any appreciable extent. It's certainly in the bloodstream and it passes through those organs, but if there's no concentration mechanism, it takes fairly substantial intakes to get PCs that are anywhere above single digits.

DR. MAURO: Jim, this is John. For the one measured data point, was that expressed in dpm or micrograms or milligrams per liter?

DR. NETON: That was a dpm value which is interesting. I'm not sure why we would have a dpm per day in June 1st, 1950, although. Yeah, that's an interesting -- well, it was a made up case so, you know, the example stands as it's written even if we, we took out the made up 230 dpm value, one would get the same idea. I'm not sure exactly why we threw in this acute intake, this value, in 1950. We might

want to re-think that and pull that out and make it more realistic. I think the intent here is to show that we would use real data if we had it, and so it was thrown into this as an example, but the reality is that we don't have any data to hang our hat on in that time period.

MR. GRIFFON: Is that why, I highlighted here with the exception of one, and therefore, so you have one value above the detection limit?

DR. NETON: Right.

MR. GRIFFON: And that's why you, I wondered why --

DR. NETON: I think it was just to show that we --

MR. GRIFFON: To show that you might have one or two data points.

DR. NETON: Right, and this would apply to later years where we would have one or two data points. I think I've got an example coming up that does that where we would certainly use all valid, what we consider to be valid bioassay results above the detection limits. But we would always have that

superimposed on top of samples are at the mda or below, we would assume that the person was at half of the mda in their exposure scenario.

DR. MAURO: Jim, if you were to hypothesize that the one reading that you had was a milligram for 24 hours per liter, I remember coming across recently as part of Task Three, that you do now have a procedure to convert milligrams to dpm as a function of enrichment level. Would I be correct in assuming if, in fact, you hypothesized that you actually had a milligram number for that 1950 value, you would use that protocol?

DR. NETON: We could certainly calculate how many, how much activity, if we knew the enrichment, we could calculate how much activity that map of uranium was, corresponded to.

DR. MAURO: Is it reasonable to assume you would know that enrichment?

MR. GRIFFON: That’s a different question there.

DR. NETON: It’s a different question. I think we would know a bracketing enrichment.

DR. MAURO: You see where I’m going.

DR. NETON: Yeah, but I think that the database itself, the CER database, all the data we have are in dpm. Is that not right?

DR. MAURO: Yes.

MR. GRIFFON: That is, yeah, that's right.

DR. NETON: I'm sure that the coworker model is all in dpm so they were, if they were not in activities they were converted somehow. They must have been converted using that equation. I mean --

MR. GRIFFON: Don't say somehow, Jim.

DR. NETON: Well, I'm sorry. Right, so the coworker data as Liz is reminding me were already in dpm.

MR. GRIFFON: That's why you have dpm values.

DR. NETON: Right. So we have all dpm so that takes the conversion out of the picture.

DR. MAURO: Okay.

DR. NETON: Now we would not have a microgram value to use if there was coworker data. Now if we had a mass data that was reported in a claimant's file, it's possible we could have microgram values in a claimant's record.

MS. BRACKETT: Doesn't their data come from the same place as the CER?

DR. NETON: Yes.

MS. BRACKETT: There's nothing else besides that I thought.

MR. GRIFFON: Well, there's Delta view data, but I don't --

DR. NETON: Delta view --

MS. BRACKETT: Yes, in peoples' files.

DR. NETON: The Delta view, yes. And the way it's portrayed in our documents, and we believe this to be the case, is that if a mass measurement was made, it was only made for people who were working with unenriched uranium. If an alpha measurement was made, it was for people who were working with potentially enriched material. That's a distinction that's been made pretty much throughout the history of this program as far as I can tell.

MR. GRIFFON: Even see it in the early health physics reports that supports that because they break it out in graphs for the enriched sources that the department (unintelligible).

DR. NETON: So I guess the answer, John, to your question is if we did have a value that we received was in milligrams, we would assume that it was unenriched uranium.

DR. MAURO: Okay.

DR. NETON: But that said, in the CER database all the values have been converted to dpm even though they may have been mass measurements at one point.

Number six, an example dose reconstruction is an attempt to illustrate how we would handle, essentially, it's a similar reconstruction using coworker data except the added twist that there is some recycled uranium exposure in this example. In addition, SC&A was interested in determining how we would handle a person exposed to a plethora of different solubility types, the UNH, UF-6, UO-2-F, to pretty much any type of uranium you could have. And we would reconstruct these for cancers of the colon, bone and kidney.

The person here started in 1950, ended their employment in 1953, and this again would be an efficiency approach where the person was

monitored through urinalysis, but all the results were below the detection limit. So we would use the detection limit to model his exposure assuming a half a value of the detection limit. And then this is another example where you had one result assumed to have a positive value on June 15th, 1952, that exceeded the detection limit.

Using these analyses we looked at solubility Types F, M and S. It turned out for all of these, all of the three cancer dose reconstructions that were done, Type-S ended up being the most claimant favorable and was applied to both the missed and measured doses.

All these, of course, were modeled using IMBA. I'm not going through some of the details. In addition, it is documented that in '53 recycled uranium was present at the site. Therefore, radionuclides of neptunium, thorium, technetium and plutonium were also added using Table 5.8 of the Technical Basis Document, and they were scaled to the uranium intake. And you can see here the dpm per day intakes for the various radionuclides that were assumed.

Doing all this --

MR. RICH: Jim, this is very claimant favorable primarily because recycled uranium arrived in Y-12 in June of ’53, so it was, they assumed --

DR. NETON: They assumed the exposure started in the beginning.

MR. RICH: Fifty, which, you know, it’s very, very claimant favorable.

DR. NETON: Okay, thanks.

And one interesting thing to know is that the solubility type for some of the recycled uranium is different than S or neptunium, and Technetium-M ended up being the more claimant favorable radionuclide. All that said, we ended up with PCs of 6.7 percent for the colon, 42.8 for bone and 16.6 percent for the kidney.

One organ that wasn’t on here, and I think I’ve got an example now that will add in lung cancer. It’s pretty clear for a case like this that the lung cancer PC is going to be high, and I don’t have it in front of me, but I think it ended up somewhere in the 80 percent range. As you can imagine for Type-S

inhalations of this magnitude, lung cancer is going to be compensable.

UNIDENTIFIED: Jim, this is Joe Irana (ph) with ORAU. I just noticed that the recycled uranium was not applied until 1953.

MR. GRIFFON: Yeah, I was going to say I saw the same thing.

DR. NETON: It was in ’53, but I think what Bryce was saying was it didn’t arrive until the middle of ’53, and we assumed it was for the whole year. And that’s fine. In this particular case the PCs were less than 50, so if we knew that, we should go back and make it more realistic because we don’t want, you know, we’re sensitive to be making these things much higher than they need to be because it gives claimants a false sense of what the PC may really have been.

MS. MUNN: Absolutely. If it didn’t arrive until mid-June then I think --

DR. MAURO: -- and doing, I guess, a proof of principle. The fact that you would make that assumption for this purpose is really not a critical issue.

DR. NETON: Right, yeah, I agree. This

isn’t going out, this is not going in anybody’s record or anything. It probably doesn’t make a lot of difference at the end of the day either.

Okay, that was example six. Number seven I’m not going to go over because we really didn’t do a dose reconstruction. That was a request to indicate how we would handle the Paducah Feed Plant ash which has a much higher ratios of plutonium and other transuranics than what the TBD indicates. And you could read that analysis and see where you land on your opinion of what we’re saying there.

Case number eight again is another dose reconstruction for colon, bone and liver, and this one I guess is really not that different than the other ones other than that recycled material was present, was reconstructed ’53 through ’57. I’m not sure how this is different than the other one. So it’s essentially the same type of example, it’s just more recycled uranium later on.

It assumed that this person was not monitored at all for internal dose. I guess

that's the key difference here is this was reconstructed using the coworker model. So you have a coworker model to reconstruct internal dose, and then marry that to a scaling factor for recycled uranium. And given that the PCs were 7.4 for colon, 41 for bone and 22.6 for liver.

I don't have the lung cancer dose reconstruction, but I assume as well that this one would be well over 50 percent based on these scenarios. The solubility classes that were used are, I'm sure, very similar. It was Type-S for the individual organs even though Type-M was more likely present in the early years at Y-12.

That's sort of a thumbnail sketch of what we've put out there. We do acknowledge that we have three dose reconstructions that would be necessary to flesh out the entire picture. And that would be the exotic radionuclides at the cyclotron. At least my intent there is to do something like a Gallium-57 intake assessment, you know, where at cyclotron the Gallium-67 --

What did I say? Fifty-seven, sorry.

It’s getting late in the day.

Where a target had ruptured, and we actually have some pretty good data from one of the incident reports to use there. And then the final one would be, well, the final one would be the plutonium-type dose reconstructions for the other radionuclides that would be based on the data that we have in Delta view. So there would be two more there, and then also the additional one that I talked about with the external extremity exposure to betas, case number four.

Well, that’s it.

MS. MUNN: Great.

MR. GRIFFON: And just you mentioned polonium earlier on.

DR. NETON: Right, we need to take a look at polonium.

MR. GRIFFON: Whether that’s -- I don’t even know the quantities or how often those runs took place.

DR. NETON: Polonium stopped being produced fairly early on. It was the first thing that was run through the cyclotron, and I think polonium production 1951 started, and I think

it only ran through like ’52. And there was an incident of polonium that was, I think, pretty well documented.

MS. BRACKETT: Polonium-208.

DR. NETON: Polonium-208, that’s right. And I did check. I think Joyce Lipsztein asked awhile ago if we had Polonium-208, and I think I checked then, but it’s in there. It’s not your garden-variety polonium, but I guess it’s no big deal to add in the half-life and the specific effective energies in there for whatever reason. So we can look at the polonium and the plutonium possibly.

MR. GRIFFON: Any other comments on the cases?

MR. PRESLEY: Mark, this is Bob Presley. It’s all right if I listen?

DR. WADE: Yes, it’s fine.

MR. GRIFFON: Yeah, I think we’re close to conclusion actually.

DR. WADE: But it’s perfectly acceptable, Robert, for you to listen. You know, it’s a public call so feel free to listen.

MR. GRIFFON: Yeah, and I think that’s the way Lew laid out the ground rules earlier on

so that's fine.

Any other questions on the cases? I think we all, I think we need time to digest these cases obviously, but I think that was a good overview of what the cases are. I don't see any gaps in the types of cases we would be looking for although I think you've covered pretty much --

DR. MAKHIJANI: Mark.

MR. GRIFFON: -- the ones we could think of during this process. Yeah.

DR. MAKHIJANI: This is Arjun. I had a question on the Polonium-208. I understand the internal dose adjustments in terms of the alpha energies and so on. It also has a sort of a one percent decay in the Bismuth-208 which has a pretty (unintelligible) gamma component. It doesn't say here in what I have in summary how frequent these gammas, what percentage have 2.6 gamma, and very high energy beta also, .9.

DR. NETON: I'm sorry, Arjun, I'm having a little trouble hearing you.

MR. GRIFFON: You're fading off a little there.

DR. MAKHIJANI: I'm sorry. There's a small minority of Polonium-208 disintegrations, at least in my, I have a little summary table here that shows a Bismuth-208, but probably it wouldn't build up very much. It has a very low half-life. I may not amount to anything but it maybe worth a footnote that there is this thing and it doesn't amount to anything. I don't think it would be significant, it's just --

DR. NETON: Well, I didn't mean to imply that IMBA would not necessarily have accounted for that. I was just sort of speaking off the top of my head that normally the change of radionuclide, if it doesn't have any sort of other daughters, it's easy to put in this specific effect.

MS. BRACKETT: They do, they have to do annual doses and they split up energy. So it wouldn't just be taking Polonium-210 and the half-life.

DR. NETON: So I'm sure, we could take a look at that and verify that we do or do not handle the Bismuth-208 decay mode. And if it's not, figure out why and if it's a problem

if it is in there, fine.

DR. MAKHIJANI: It most likely will not be but just as a check.

DR. NETON: If it's a minor decay process and it has a much longer half-life than Polonium-208, my gut feeling is that it's not really going to be a dosimetric issue.

DR. MAKHIJANI: And I agree.

MS. MUNN: So Mark, what are we expecting in Denver?

CONCLUSIONS

DR. WADE: Well, this is Lew. I've kept a list of things that I think, you know, generically we've agreed to. Maybe I could just run that list and then you guys could refine it.

MS. MUNN: That'd be great.

MR. GRIFFON: That'd be great.

DR. WADE: My first item is I think there's the expectation or the hope that John Mauro will notify the working group really quite quickly when the working group could expect to see the SC&A report that would look at their review of the sample DRs. And John, you were going to go back to your place and think about

that and give the working group some sense of what they might be able to expect and when.

DR. MAURO: That's correct.

DR. WADE: And we appreciate that.

I, Lew Wade, am going to seek someone with the wisdom of Solomon to come and explain to the Board what happens if we do, indeed, have a, if you do, indeed, pass on and an SEC is approved that looks at workers who should have been or were monitored for thorium, for example. How would those judgments be made? How would that decision actually be implemented by DOL? And hopefully, we'll have that presentation and discussion at the next meeting.

There are a number of issues where NIOSH needs to get final clarifications or some issues to the working group. And I would ask Jim that at some point in time that you would prepare an e-mail to the working group that would contain that information. Maybe you're sharing it as you go, but at some point, maybe at the halfway point between here and the start of the next Board meeting, you would provide information to the Board of the

type you promised that you would be considering for them to consider.

DR. NETON: Lew, I just want to make sure I'm clear. You're talking about what we agreed to look into as far as the resolution matrix as well as the --

DR. WADE: Right, there were a number of issues where it was open that you were going to provide some further clarification if possible to the working group.

MR. GRIFFON: Right, I've actually edited the matrix I can probably turn this around by tomorrow even and --

DR. NETON: Mark, that'd be excellent. I just want to make sure we're all in agreement on what --

MR. GRIFFON: But there's just a few items, and I think several of them you may have already completed. It's a matter of just making sure we all know where they are.

DR. WADE: But I would ask that we pick a maybe -- this is, what's today's date?

MR. GIBSON: It's Tuesday, the 11th.

DR. WADE: The 11th, and the working started on the 25th, so the halfway point between those

two would be the 17th. What day of the week is the 17th? It would be --

MS. MUNN: It's Monday.

DR. WADE: Monday, so maybe you could aim, Jim, for a communication by the 17th?

DR. NETON: That would be next Monday.

DR. WADE: Again, because we have to give the working group an opportunity to digest this so at least set that as a planning mark if at all possible.

And then there needs to be a procedure worked out where SC&A can have meaningful interactions with dose reconstructors. But the way we've left that is that SC&A as it has that need will approach fulfilling that need by contacting Jim. And we have a lot of good examples of how we can do this.

And, you know, I think we all trust the good offices of both parties to see that that happens. It will be important for SC&A in the conduct of its review to be able to ask some questions in near real time. I think we all want to work to see that that happens.

So that was my list of sort of big items that, generic items not technical items,

and Mark and Wanda and Mike, you can add to that as you see fit.

MR. GIBSON: Lew, if I could, on your item with having DOL brief us about the thorium issue, I would like to expand that to all isotopes, how they, you know, whether there's data, lack of data, how the data's interchanged. It's exposure to any isotope not, in this case particularly it may be thorium, but complex-wide it's just how any isotope --

DR. WADE: I understand. I will --

MR. GIBSON: -- or generally how they make those judgments.

DR. WADE: Well again, all I can do is seek to provide that to you, but I'll work hard. But thank you. That was a very important discussion that you led us in, Mike.

MR. GRIFFON: And I think you, you know, the matrix items are, there's no need to go through those. I just, I'll turn the matrix around in a day or maybe, well, I should get it out by tomorrow. And, Jim, I'll make sure, maybe even highlight the remaining few that need closure and we can go from there.

MS. MUNN: Mark, my concern still hanging on the time issue is how we as a working group are going to have an opportunity perhaps in the morning before the meeting begins to meet briefly. Are we not intending to bring recommendation or a presentation to the Board?

MR. GRIFFON: I'm not sure. What is the schedule, Lew, for the 25th? Is it starting at one p.m.?

DR. WADE: Well, we're going to start with subcommittee in the morning, so we could make part of the morning available to the working group.

MS. MUNN: I was just really concerned that we be prepared to present what, if I were not on this working group and on the Board, I would be expecting a recommendation from us. And I'm not at all sure that we have --

MR. GRIFFON: And I'm not, I mean, we're going to be tight on time because it depends on when John can turn a report around, but I'm guessing that it'll be up against the time limit.

MS. MUNN: Yes, I suspect so, too, and my concern is that we have at least enough of a

presentation available for them to let them know what issues were addressed by the matrix.

DR. WADE: We could hold open the possibility of a call like this any time between now and the start of the Board meeting on the 25th. We could schedule time on the evening of the 24th.

MS. MUNN: I think that would be wise for us to do some such thing. I'm not sure exactly what's the best date for that, but it seems to me -- do you have that feeling? Am I the only one that's concerned about this? Mark? Mike? What?

MR. GIBSON: Not at all.

MR. GRIFFON: No, you're not the only one.

MS. MUNN: I just want to make sure that when we get to the time certain we're not going to be in a position of saying, well, the working group got through most of this except that we still need this from this person and this from that person.

DR. WADE: Well, what I'll do tomorrow is I'll have LaShawn to query the three members of the working group, Mike, Mark and Wanda as to time available for a conference call, say

starting from the 17th all the way up through the 24th. And then once you're in receipt of John Mauro's communication, then I'll be in touch with Mark and we can decide when we want to schedule such an interaction.

DR. MAURO: Lew, for many of us we'll be traveling on the 24th, so the meeting if we are going to have a conference call to see where we are, probably would have to on, you know, up to the 21st. I believe I'll be flying most of the day on the 24th.

DR. WADE: Well, we'll put out a feeler tomorrow to see, so we'll plan ahead a little bit, but we'll hold open the possibility of the working group getting together to look at the recent information and try and consolidate a recommendation to the Board.

MS. MUNN: I think that's wise.

MR. GRIFFON: Timing is critical. The other thing hanging out there is that we still, you know, we'll try and get some information from DOL, but that's not going to happen until the Board meeting. That might also --

DR. WADE: Right, but then I think the whole Board needs to hear that. I mean, there's no

processing you'll need to do on there.

MS. MUNN: It's our job. Bob, you said something?

MR. PRESLEY: Am I still not part of the working group or something that I'm not privy to?

DR. WADE: No, you're part of the working group although I just have to determine whether I can do this call as a public meeting or not based upon my ability to do Federal Register material. So if we can do it as a public meeting then you would be privy to the discussion, Bob, but I have to work those details out.

MR. PRESLEY: Okay.

MS. MUNN: Well, just look for the e-mail.

MR. GRIFFON: And John, you'll let us all know within a few days anyway, right, what --

DR. MAURO: Well, the next step right now is I've got to caucus with the crew and get our bearings and get back to you very quickly. My guess is within a day or two we should be able to give you a date for when we will be able to provide you with our findings regarding the various cases.

Jim, as soon as you can get us the other cases the better.

DR. NETON: Will do.

DR. MAURO: We certainly have plenty to do to start right now with the cases you already provided us.

MS. MUNN: Jim, if it's not too inconvenient for you, if you have them in electronic form, if you'd send them to the members of the working group here as well as putting them on the O drive because some of us are still a year behind for where we ought to be.

DR. NETON: That's fine. I can do that. I may have to break them up. There's --

MR. GRIFFON: There's a lot of pieces.

DR. NETON: -- a lot of pieces of spreadsheets that might be too big.

MS. MUNN: Well, not to worry.

DR. NETON: I will do it.

MS. MUNN: Appreciate it.

DR. NETON: Mark, could I ask you a favor? When you do the resolution matrix, could you somehow like highlight the ones that stand out in your mind so that --

MR. GRIFFON: I think I will put them in

yellow highlight.

DR. NETON: Yellow or something so that, because that would just be more obvious. Sometimes --

MR. GRIFFON: Right, they're buried in the paragraph. I will do that.

DR. MAURO: If I could make just a brief announcement for the SC&A people on the line. After we finish up, could we have a conference call at five o'clock? Could you call on our standard number? Joe, are you still on?

MR. GRIFFON: Have they all hung up?

DR. MAURO: I'll take care of it. Don't worry about it.

MR. TANKERSLEY: Bill's still here. I can call in at five.

MR. GRIFFON: Okay, I think we're all set. Anything else from any work group members or anyone else, Jim or Lew, any closing comments?

DR. NETON: No, I'm fine.

MR. GRIFFON: I think we're good until tomorrow morning then for ten a.m. I think on Rocky, right?

DR. WADE: Yes.

MS. MUNN: Yes.

DR. WADE: Thank you for a long and productive day.

MS. MUNN: We will see you tomorrow morning at seven o'clock my time.

DR. MAURO: I think that's right, ten o'clock eastern?

MS. MUNN: Ten o'clock eastern.

(Whereupon, the working group teleconference concluded at 4:40 p.m.)

CERTIFICATE OF COURT REPORTER

STATE OF GEORGIA

COUNTY OF FULTON

I, Steven Ray Green, Certified Merit Court Reporter, do hereby certify that I reported the above and foregoing on the day of April 11, 2006; and it is a true and accurate transcript of the testimony captioned herein.

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

WITNESS my hand and official seal this the 4th day of July, 2006.

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STEVEN RAY GREEN, CCR

CERTIFIED MERIT COURT REPORTER

CERTIFICATE NUMBER: A-2102