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

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ADVISORY BOARD ON RADIATION AND WORKER HEALTH

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IDAHO NATIONAL LABORATORY WORK GROUP

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TUESDAY
NOVEMBER 10, 2015

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The Work Group convened in the Brussels Room of the Cincinnati Airport Marriott, 2395 Progress Drive, Hebron, Kentucky, at 8:30 a.m., Phillip P. Schofield, Chairman, presiding.

PRESENT:

PHILLIP P. SCHOFIELD, Chairman
JOSIE BEACH, Member
JAMES M. MELIUS, Member
GENEVIEVE S. ROESSLER, Member

ALSO PRESENT:

TED KATZ, Designated Federal Official
BOB BARTON, SC&A
HANS BEHLING, SC&A*
RON BUCHANAN, SC&A*
DOUGLAS FARVER, SC&A*
MITCH FINDLEY, ORAU Team
JOE FITZGERALD, SC&A*
BRIAN GLECKLER, ORAU Team*
LARA HUGHES, DCAS*
JENNY LIN, HHS*
MIKE MALLETT, SC&A*
JOHN MAURO, SC&A*
JIM NETON, DCAS
STEVE OSTROW, SC&A*
JOHN STIVER, SC&A
TIM TAULBEE, DCAS

*Participating via telephone

T-A-B-L-E O-F C-O-N-T-E-N-T-S

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

(8:31 a.m.)

MR. KATZ: Okay, welcome, everyone. This is the Advisory Board on Radiation and Worker Health. It's the Idaho National Laboratory Work Group and we're ready to get started here.

First thing is we'll do roll call, and since we're talking about a specific site today, for all agency-related people, please speak to conflict of interest and we'll begin with Board Members in the room.

(Roll call)

MR. KATZ: Okay. So just to remind all of you on the line to mute your phones except when you are addressing the group. Press *6 to mute your phone, *6 to come off of mute. And, please, no one put this call on hold, but hang up and dial back in if you need to.

And with that it's your meeting. By the way there are -- All of the presentations for the meeting are on the NIOSH website under today's

meeting, Board Section, or almost all of them.

I'm not sure, is Tim Taulbee's up there, too?

MEMBER BEACH: Yes.

MR. KATZ: Okay, super. Okay, so they're all on the NIOSH website. You can follow along that way as these presentations are given and there is the original NIOSH ER Report, the Evaluation Report, on the SEC on there as well. And with that it's your meeting, Phil.

CHAIRMAN SCHOFIELD: The agenda is also on the website for those who are trying to follow along with this.

So we're just going to go right down the way it's written out, so we'll start with Tim.

DR. TAULBEE: All right.

MR. KATZ: Okay, and before you start, someone doesn't have their phone on mute. It sounds like a train in the background. I don't know, it probably is not a train but there is some background noise from someone's phone.

So, again, everybody mute your phone. If you don't have a mute button, press *6 to mute your phone, otherwise the other folks on the phone are going to have a hard time hearing.

CHAIRMAN SCHOFIELD: Thank you.

DR. TAULBEE: Thank you, Phil. My presentation today is really just an update from what we presented in July to the full Board to give you an update of the additional information that we received shortly thereafter the Board Meeting and I sent this out to you all in September and hopefully this will start some of the discussion about the INL SEC proposed Class for CPP workers.

So an overview, I'm just going to refresh everybody's memory on some background information and then give an update of where we are with review of the NOCTS claims, the data gaps, and the dosimetry report monthly comparison and then give a little bit of an update on our INL/ANL-West activity timeline.

So, first, again, a refresher on the

dosimetry at INL, remember we proposed a Class for CPP workers and proposed to identify them based upon their dosimetry badges.

And in the early years from 1963, well actually all the way up through 1953 up through 1970 they had a one badge, one area methodology to where if a worker was routinely monitored at MTR and they went to CPP, they left their MTR badge at the MTR checkpoint and then picked up a temporary badge at CPP.

Visitors picked up their temporary badges at CPP and so the dosimetry records we have, CPP main badge reports, which are the Codes 5, 53, and 55. We have the CPP temporary badges, and then the CPP construction, which are Codes 11, 113, and 115.

These were the examples that I provided before that show the CPP main badge report and you can see some of the contractor codes of Phillips Petroleum, AEC, Atomic Energy Commission workers, even some NRF folks as well as subcontractors such

as FC Torkelson there within that main badge report.

For the temporary badge report this is where you pick up most of the contractors that are out there and the example here I've got is a news reporter, other Phillips employees from other areas within the INL site, additional AEC personnel that didn't routinely go to CPP, and then construction trades.

They just write FC Torkelson, and even vendors, such as Coca-Cola coming in to deliver Cokes to the cafeteria and resupply vending machines and that kind of thing.

These people were all monitored coming in to CPP and most of the vendors are all on these temporary badge reports with a few construction trades. I shouldn't say a few, a lot of construction trades that are listed there.

Well CPP also had a construction badge, or dosimeter badge report as well, and this would be the CX dosimetry, and this is what we didn't have

available at the Board Meeting back in July and since then we have gotten.

What you will see here is the codes, HK Ferguson was the main contractor, you've got miscellaneous construction as well as H.S. Wright here on these particular reports.

So, again, as a background, multiple types of workers were badged upon entry to CPP. The workers dosimetry could appear on any one of several reports, and multiple reports.

For example, they could've been on CPP construction and then they came up on the temporary CPP dosimeter report if their construction job finished and then a month later they came back, so a worker's name can appear on multiple different variations of this.

And this is up through 1970. Now after 1970 as we presented back in July we have proposed to open the Class to anybody who was monitored and the main reason for that was you were no longer, you could now where your MTR badge into CPP, and

so we kind of lose track of who could have gone into CPP.

It was basically anybody who is monitored at that point. So that was our reason for doing so.

So now I want to talk a little bit about the follow-up of the INL claims that we have done in NOCTS. And so our first review was to determine whether the employment period was within the proposed SEC.

And so there is a total of 1753 INL claims in NOCTS as of April when we started this evaluation. Eight hundred and seventy-two of them did not work during the SEC time period, 881 did have employment during the SEC time period.

Our second review is to take these 881 claims and determine if there is an indication of work at CPP. And so what we looked at was the computer-assisted telephone interview, the dose reconstruction report, and the DOE file.

And so as of July I mentioned that there

were 32 claims that needed following up on at that time. After receipt and review of the CX dosimetry file this got narrowed down to ten claims.

A lot of them appeared on those CX dosimetry reports and so then we were down to ten. In October we are actually down to seven claims that needed following up of.

We went back and looked at it, three of them we could put as part of the Class from that 1970 to 1975 time period, so they had dosimetry in other time periods, they were part of the Class.

I guess we could have done follow-up with the site but it just seemed like if the Class was accepted as of today they would be part of the Class.

The request for supplemental information on the seven claims was sent to the site on October 5th and then a Request for Supplemental Information for 11 additional claims that SC&A identified, and we'll talk about I think in the next presentation, was sent on October 13th.

So in total right now there is 18 of 881 claims, or 2 percent, that are being followed, that we've got at this time. Now the reason why we haven't received an update on these claims right now has to do with the ANL-West SEC that we are currently working on.

We ran into a dosimetry issue and we ended up making a request of 42 claims from the site to try and get follow-up on some dosimetry questions that we had there.

We submitted those back at the beginning of September. We just received all of those from the site the week before last. So the site is just now starting to work on these 18, and so that's why we haven't received anything from that. Last Thursday is when they sent the request over to INL.

The INL Dosimeter Records Group that responds to our claims makes a request for records over to the separate contractor actually, to CH2M Hill, I believe, and they pull previous requests

so that they aren't sending us duplicates for these supplemental requests.

And that happened last Friday, is when that request went over. So she was expecting that in the next several weeks, probably by the end of the month that we would have all of these in hand.

So one of the questions that came out of my initial presentation to the Board was, I believe it was Dr. Kotelchuck made the comment of okay, I guess he understood that we felt everybody was monitored there, but he wanted to know do we have all of the dosimetry reports.

It's one thing to know that everybody is monitored, but do you have any gaps in the data, do you have all of these, so we looked for gaps in the data.

And so we compared the number of dosimeters reported in the Health Physics Monthly Reports, these are periodic reports that were given by the site, so their dosimetry branch they would tally up how many dosimeters from each area that

they process and report on that to their higher management and then all the way up to AC, versus the actual listing, the badge listing reports that we receive from the site. So that's what we are comparing.

So the first step was to look at all of our dosimetry reports and do we have any identified gaps across the time period. And after follow-up with the site the only time period that is missing in that entire grouping is December of 1970, the only month that is missing through the entire 1963 through 1974.

It's interesting to note that the cycle end date was December 25, 1970, so I am suspecting that on Christmas Day the person responsible for hitting print to print out that dosimetry report did not.

These were an IBM system. The actual dosimeter result is there. We did a comparison of the annual report and then tallied up their January through November and their annual dose is higher,

so that December value is in there it's just there isn't a series of monthly reports that anybody can find for that.

So it's really not of a significance from a Class administration standpoint. If somebody has a dosimeter on an annual report in 1970 then they could be assumed as part of the Class due to our allowance of all monitored workers from March of 1970 during that time period.

So that missing month really has no impact on the administration of the Class in my opinion. And that last bullet there is just talking about our check and the January through November was lower than what that annual total was, so we know the dose is there, it's just there wasn't a monthly report printed out in hard copy.

Temporary badges, none appear to be missing. Again we looked from 1959 through 1976 and we have temporary badges for every month during that time period.

CX dosimetry, again after the follow-up

from the previous Board Meeting in August there are no gaps of missing data in the CX dosimetry reports.

We did have to go back to the site. There was three months that appeared to missing. We made them go back to the records box in late August and they pulled that box and they simply didn't scan those three months of pages and so they sent them and so we now have all of them.

So the next part that I started to talk about a few minutes ago is comparison of the monthly Health Physics Reports, the CPP dosimetry.

And, again, the goal here was that if the site indicated they processed 500 dosimeter badges do we have 500 dosimeter results, names listed on these reports, and that's what the purpose here was, to see do we actually have all of the data.

We reviewed from 1963 through 1970 and we found very good agreement on the monthly reports and the dosimetry printouts, and this is a graph of that.

Where you see the red and green is the CPP monthly reports and the CPP dosimeter printouts, and you see they track very well. Interestingly, the CPP dosimetry printouts have more names than were reported on the monthly reports.

So I imagine this was a few additional people per month that were coming through and they made into the IBM system but by the time the report was being written those numbers weren't tallied, so we actually have more names listed than what we have on the monthly reports.

The blue across the bottom is the CX dosimetry, which would be the construction trades. Interestingly, with CX nomenclature it was used in the early years for construction, then it wasn't used, and then they went back to it in April of 1964.

And if you look at some of the early, say January, February, March of 1964 workers for HK Ferguson you'll see them on the main CPP badge, so you'll see them up there in that green area up

there at top.

And then starting in April of 1964 they start appearing on the CX dosimetry, the same workers, the same badge number, it's just a different area, if you will, same contractor, HK Ferguson, and so it was a just a transition of them starting back up the CX dosimetry designation for area.

The next slide is just a blowup of the CX dosimetry and, again, you can see very good agreements between the monthly reports as well as the CX dosimetry printouts.

And, again, 1967, you'll see we have some more construction trades workers on the printouts identifying the names than what were reported in the monthly reports.

We also looked at the CPP TLD dosimetry. And, again, if I go up a couple of slides here you'll see in 1967 there is a big drop off.

Well that's the initiation of the TLD dosimetry at INL and so people who were on a monthly

basis are now on once every three months so the actual number of dosimeters drops but they maintain some people on a monthly basis, the people who were regularly going into the cells, working in the shift laboratories, working in the remote analytical facilities.

The areas where we identified that we have trouble reconstructing dose, or we can't, it's infeasible due to the plutonium exposures, are really those workers down there at the bottom that are maintained on that monthly dosimetry, okay.

Those were the ones who were most likely to be exposed, going in, doing the cell cleanouts, et cetera, and so you'll see that they maintained a level of those individuals.

Others, such as secretaries or other admin staff, clerks and so forth, were switched over to TLDs. And construction trades, as you recall, with the big spike there that happens in 1967 that was a remodeling effort that was going, and so you'll see more construction trades for a

shorter period of time and then it drops back down.

So the TLD dosimetry didn't start until the mid-part of 1966, and you'll see the numbers are in pretty good comparison and they were doing quarterly initially and then they started going to semi-annual.

And the only one where we don't have that comparison is down there at the end with that December of 1970 in order to compare the monthly reports versus the TLD printouts.

So some comparison statistics here, for the CPP prime contractors from '63 through November of 1970, and remember we're missing that December of 1970 report so I really couldn't compare, the monthly reports indicated 35,000 dosimeter badges and we have 36,000 that we identified on the printouts, so the difference is a plus of 358.

Construction trades is actually a little closer, 6956 to 7011, and then the CPP TLDs are 3461 to 3481. So overall there is 46,000 badges reported on the monthly reports and on the

dosimeter printouts there is 46,000 names printed there.

So the average monthly difference was about 3-1/2 dosimeters and if you look at some of those numbers you are looking at several hundred, so this is a very small percentage and difference between those two reports.

So in summary we followed up with the follow-up of claims. Between NIOSH and SC&A the number of claims to be followed up has been reduced to 18 of 881, or about 2 percent.

Thus, the current Definition works for at least 98 plus percent of the claims. We didn't identify any significant data gaps and we have good comparison between the periodic reports and the dosimetry data.

So I have put the proposed Class Definition in here again just to remind everyone that what we are proposing is for all workers, all employees at the Department of Energy, its predecessor agencies and their contractors and

subcontractors who worked at the Idaho National Laboratory in Scoville, Idaho, and a) who were monitored for external radiation at the Idaho Chemical Processing Plant at least one film badge of dosimeter or TLD dosimeter from CPP between January 1, 1963, and February 28, 1970, or who were monitored for external radiation at INL at least one film badge or TLD dosimeter between March 1, 1970, and December 31, 1974, for a number of work days aggregating at least 250 work days occurring either solely under this employment or in combination with work days within the parameters established for one or more other Classes of employees in the Special Exposure Cohort.

So I'll pause here and ask is there any questions.

CHAIRMAN SCHOFIELD: This is Phil Schofield. I've got just one question. We know there were technicians or workers, occasionally they would have these I guess you'd call them flakes discharged from the exhaust stacks.

DR. TAULBEE: Yes, sir.

CHAIRMAN SCHOFIELD: And they would have workers go out outside of the building with vacuum cleaners with the filter on it vacuuming up these flakes or whatever you want to call them, from the discharge.

DR. TAULBEE: Yes.

CHAIRMAN SCHOFIELD: The question is were those people badged for CPP since they did not go in the building but rather were working outside the building or right alongside it?

DR. TAULBEE: If they entered the fence line then they were badged. Outside the fence line they may or may not have been badged.

The thing with those flakes coming off is that remember our primary end feasibility is the actinide, so plutonium and transplutoniums that were in the cells, the corridors, the operating corridors, and the analytical laboratories, that they could have been separated from fission products.

Those flakes were actually fission products and so our methodology for reconstructing that actinide exposure for other workers that, well actually throughout the entire plant, is to use fission product bioassay and a ratio method to apply to estimate what those actinide exposures were.

Those flakes were not the actinides that came out the stack. They were lanthanum primarily that got scavenged during the steam release coming out the stack, and so the fission products were present.

So their fission product bioassay we would be able to estimate their actinide dose. Within those labs and those cells is where they were doing some of the separations to recover plutonium in 1965 up and through the 1970's and those are the workers that don't have plutonium bioassay.

We can't use the fission product bioassay because it's been separated at that point, so that's why we can't use that as the estimate.

MEMBER MELIUS: Yes, Jim Melius. A couple of questions for you, Tim.

DR. TAULBEE: Sure.

MEMBER MELIUS: On the slide that has follow-up claims, well it wasn't quite clear to me why you discarded the three claims in October. You had ten and you said three, it was --

DR. TAULBEE: When we did a further evaluation these people were part of the Class due to the dosimetry from 1970 to 1975, and so what I was trying to do was minimize the impact on the site and since we know these people are already part of the Class the ones that we still had questions upon we would then ask for their dosimetry follow-up.

MEMBER MELIUS: But these people did work during the early time period and there was some discrepancy in the information you had from the earlier time period, or the lack of?

DR. TAULBEE: Well the discrepancy is from an annual summary standpoint.

MEMBER MELIUS: Yes.

DR. TAULBEE: So I mean we could request those from that standpoint. I just didn't feel it was necessary. I felt the other ones would help answer or identify if we had any questions.

MEMBER MELIUS: It just seems to me that you have a relatively small sample to be, you know, sort of matching against and --

DR. TAULBEE: Well, and, again, we've evaluated 881 down to this, so it's not a small sample.

MEMBER MELIUS: Well, no, but I mean where there is a discrepancy. If you are trying to understand what the reasons for the discrepancies are if there any?

DR. TAULBEE: Well I believe the discrepancies are almost always the annual summaries at this point where we don't have complete information due to that agreement with DOE that if they had less than 500 millirem we're not going to get their full record, and that's the bulk of these individuals that we've got.

One of the other things that is important to realize when we are analyzing these claims is that some people in their CATI will indicate they worked at CPP and if they have dosimetry in that time period of 1970 to 1975 they very well could have worked at CPP and we have no record of them being at CPP.

So when people are indicating in their CATIs they are not necessarily specific on the dates that they are, that they worked there, and so if we don't have any CPP dosimetry from '63 through 1970 and they say they worked at CPP and we have dosimetry from say MTR from 1970 to 1975 they very well could have worked at CPP, taken that MTR dosimeter, and walked into CPP.

So I felt like if they were part of the '70 to '75 group, whether we find dosimetry or not, it really also doesn't mean that they didn't work at CPP or that there is a gap.

Their employment at CPP could have been between '70 and '75. Do you follow me there?

MEMBER BEACH: And they're still included?

DR. TAULBEE: And they're still included as part of the Class.

MEMBER BEACH: Because they have one TLD --

(Simultaneous speaking)

MEMBER ROESSLER: Oh, okay.

MEMBER BEACH: All right, got you.

MEMBER ROESSLER: So what you are saying is they remembered wrong?

DR. TAULBEE: Well, correctly. In one of the cases, just to talk a little about somebody who remembered wrong, is they indicated they worked at CPP in the early years and then they went to work in the NRF and worked on the Test Area North and DOL as part of the claim requested an affidavit and the affidavit from one of their colleagues indicated that he worked with them at NRF and up at Test Area North but he didn't say anything about CPP.

When I went back and started looking at the particular claim I couldn't find any dosimetry for CPP from the time period that he said. He said he started employment out there in 1963.

I found his CPP dosimetry in 1961, two years prior to when he said he started working at the site for the company that he said he was working for.

So recall bias, you know, memory, and this is a particular claim that we're going to need to go back and redo because he clearly started working there two years prior to when he said he did and our dose reconstruction starts in 1963, which is when he said that he started out there, and his employment was verified via affidavit, but now we have CPP dosimetry for him in 1961.

So people's, you know, memories of dates, you know, can be wrong.

MEMBER BEACH: That was 54 years ago.

DR. TAULBEE: Exactly. Exactly, that's a long time ago to remember, you know,

exactly when you started and I thought he did a fantastic job and I think it also speaks to the quality of the records that we can see that, you know, there is more employment there than what he indicated based upon these dosimetry records.

And you said you had multiple questions, Dr. Melius?

MEMBER MELIUS: Yes. The other one is just I'm trying to understand your comparison statistic slide and that it --

DR. TAULBEE: Yes, sir?

MEMBER MELIUS: When you summarized these, Tim, did you take -- this is based on individual monthly reports?

DR. TAULBEE: That's correct.

MEMBER MELIUS: So it's not a listing. So when you have like dosimeter printouts versus monthly reports it's not by individual it's based on how many individuals were on the monthly reports versus how many were on the dosimeter printouts?

DR. TAULBEE: The monthly reports are

summations that are given by the site.

MEMBER MELIUS: Right.

DR. TAULBEE: The dosimeter printouts we went through and counted the number of --

MEMBER MELIUS: For the month, for the same time period as the monthly --

DR. TAULBEE: For that same time period, yes.

MEMBER MELIUS: That's not necessarily clear from the way you've labeled the table.

DR. TAULBEE: Oh, I'm sorry.

MEMBER MELIUS: You don't have reports, so I'll give you the benefit of the doubt. I was just trying --

DR. TAULBEE: Oh, okay.

MEMBER MELIUS: No, because some cases one is higher than the other. I mean --

DR. TAULBEE: That is correct.

MEMBER MELIUS: Yes, so the difference is not always in the same direction, but that's not a major point.

DR. TAULBEE: That is correct. Yes, there are some months where it can actually be short by 20 and the next month it's plus 20.

MEMBER MELIUS: Yes.

DR. TAULBEE: That's where the reporting cycle changes slightly.

MR. BARTON: Tim, on Slide 9 I don't know if it's a typo or something has changed, but it says 1970 to 1975.

DR. TAULBEE: What slide?

MEMBER ROESSLER: What's the title on the slide?

MR. BARTON: Oh, we were just looking at it, it was describing the seven claims.

MEMBER MELIUS: The follow-up claims.

MR. BARTON: All the follow-up claims.

DR. TAULBEE: It's probably a typo on my part.

MR. BARTON: Okay. I didn't know if the SEC period does --

(Simultaneous speaking)

DR. TAULBEE: No. Yes, okay, that's a typo on my part. I'm sorry.

MR. BARTON: All right, no problem.

MEMBER ROESSLER: Good catch.

DR. TAULBEE: Other questions?

CHAIRMAN SCHOFIELD: I guess we'll let SC&A do their --

MR. BARTON: Oh, he has more.

DR. TAULBEE: Or do you want me to --

CHAIRMAN SCHOFIELD: Oh, you have more, go ahead.

DR. TAULBEE: Let me give you an update on where we are with the Idaho SEC activities in general.

We are working on the ANL-West SEC petition. We had hoped to present this in a couple weeks, or next week to the Board. This has been delayed. The Evaluation Report is, they expected late January, early February, as for our current timeline.

What ended up happening was we were

finalizing the report and we did a comparison of bioassay data, urine and fecal results, well let me back up a little bit.

We decided to a test. ANL-East has always said that they did not have any of ANL-West records since around the beginning of this program.

INL has claimed that they had all of the ANL-West records but we were finding some very serious gaps in monitoring from what workers told us and what we believed to be the monitoring program.

So we did kind of a blind testing. We took eight workers that we knew worked in the early time period, some of them started at ANL-East and moved out to ANL-West, so we knew ANL-East should have some of their early records and INL should have the latter records.

And so we sent these eight people to both ANL-East and ANL-West, or ANL-East and INL, I'm sorry.

When we did this follow-up request what

we found is that of the eight people, eight of the eight had bioassay records at ANL-East, all eight of them starting in 1952.

So, clearly, there was a problem with what they understood they had and what we understood them to have.

This is what caused the follow-up request of the additional 42 so we could make it an even 50 for our sample size, and that is what has delayed some of this follow-up here, is that both sites needed to respond to whether they had the bioassay records associated with both sides, and so it's taken us some time to do that.

Like I said we just received all of those follow-up records on October 28th, and so we are currently evaluating that. That is the primary reason for this delay that you are seeing here.

While we were waiting on the follow-up of those records we did begin work on the reserve sections of the ER. That turned out to two data

captures, one was the week of October 19th and the second one was just last week when we were out there.

From our follow-up there we have identified that we need to conduct a couple of interviews and so as SC&A is formalizing their interview lists for whenever you are doing that we would like to ask that we can add a couple of people to that so that everybody can hear these particular interviews.

Our goal is still to have the SEC Evaluation Report for the addendum to the petitioners and to the Board in February. I am not sure that that's going to be possible, but we are going to be trying here.

A little bit depends upon when the site releases those records, but our current goal is still to try and present the addendum at the March Board Meeting along with the ANL.

ANL will definitely be ready by then, but the question is is whether the ER addendum will

be ready by March 14th.

MEMBER ROESSLER: So say that again, what's going to happen in March?

DR. TAULBEE: March, the ANL-West petition will definitely be ready.

MEMBER ROESSLER: Okay.

DR. TAULBEE: And we are believing that we can still get those reserve sections of the SEC 219, this initial one, ready by then as well.

MEMBER ROESSLER: Thank you.

MR. STIVER: Tim, this is John. I just had one question regarding your most recent data captures, just in the interest of, you know, coordinating everything with you guys so that we don't have any overlap in our searches and so forth.

When you get that data available could you please point out to us where to find it on the SRDB so that we don't have to hunt around for it and all that sort of thing?

DR. TAULBEE: Oh, okay, sure.

MR. STIVER: Okay. And you did say you

concentrated mainly on reserved areas, you didn't do anything like the CPP pre-'63 or some of the other areas where you can reconstruct?

DR. TAULBEE: No. We did not do anything on the pre-CPP era. We did look a little bit in the post-CPP era where we were looking at an 83.14 to potentially extend the Class and that is what's prompted these interviews.

MR. STIVER: Right.

DR. TAULBEE: We are seeing some concerns that we need to address from that standpoint.

MR. STIVER: Okay.

DR. TAULBEE: But that is the post-1975 time period.

CHAIRMAN SCHOFIELD: Would it be premature to ask what those concerns are?

DR. TAULBEE: A little bit, but I'll tell you anyway. Those concerns are is the implementation of that guidance from that report in October of 1974 were not implemented as rapidly

as one might expect, and so that's what we want to do some follow-up on associated with that.

So does that answer your question a little bit?

(No audible response)

DR. TAULBEE: What I find interesting, for those of you who have sat through the interviews, is you might have recalled hearing about a major cleanup, you know, starting after the criticality in 1978, if you remember those discussions from the interviews.

Some of the data that we found last week begins to make that make a lot of sense as to what happened, so it's kind of an interesting thing but these are just reports that we skimmed while we were out there.

We haven't received them yet from the site but obviously we have some concerns and so we'd like to interview a couple of more people and try and narrow that down.

MEMBER MELIUS: So our Board Meeting is

towards the end of March, so you've got some flexibility.

(Laughter)

DR. TAULBEE: Yes.

MEMBER MELIUS: In fact March 22nd we'll get the report --

DR. TAULBEE: You know I am trying to get them out earlier.

MEMBER MELIUS: No, I know, okay.

DR. TAULBEE: And Battelle is -- By the way, I did send the Battelle report out to everyone.

MEMBER BEACH: Got it.

DR. TAULBEE: And I learned that we actually don't have the final AEC review on that yet, so it wasn't in that, I didn't put it in the email because I didn't know it at the time, but it should hopefully be out today.

But, again, you know, one week before, we'll try and do better. It doesn't seem to be happening.

MEMBER BEACH: Yes.

DR. TAULBEE: Any other questions?

(No audible response)

DR. TAULBEE: Okay, Phil.

CHAIRMAN SCHOFIELD: Okay, Bob Barton is next up.

MR. BARTON: All right.

MEMBER ROESSLER: What's the title of your presentation?

MR. BARTON: It should be called SC&A Evaluation of CPP Class Definition Requiring Evidence of External Dosimetry. If you are on the website it's sort of the in the middle of the pack on here.

MEMBER ROESSLER: I'm taking it off of this thing and it's -- I'll find it.

MR. STIVER: The actual title, the PDF is SC&A - INLCPPDEF.

MEMBER ROESSLER: INL what?

MR. KATZ: INLCPPDEF.

MR. BARTON: D-E-F on the end.

MR. KATZ: Yes.

MR. BARTON: Just look for D-E-F.

MEMBER ROESSLER: Got it.

MR. BARTON: All right, thanks a lot. Admittedly, the first few slides of my presentation are very redundant to what Tim just presented so I'm going to try to breeze through them in the interest of time.

But this is SC&A's review of essentially that revised Class Definition from July. So here's the background. I don't want to go through each bullet.

This is essentially when the different reports were released. The most recent, obviously, the one that I am discussing currently which was transmitted at the end of September.

This lists when this issue has been discussed. The first Work Group discussion was sort of an informal, not for the public, it was a clarification and technical teleconference that involved the Work Group, NIOSH, and SC&A.

But it was also discussed at the July

8th and is currently being discussed now on November 10th, and was also first presented to the Advisory Board on March 26th and then discussed again on July 23rd.

And here is the currently proposed Class Definition. I won't read it in again, Tim did a great job of that, and here is a quick summary of what the rationale was for the original Class.

It was essentially, as Tim pointed out, exposure to the alpha-emitting transuranics that had been separating from fission activation products that could not be reconstructed.

And then the rationale for revising it was the change from one badge, one area, to one badge, multiple areas, and here is just a screenshot of one of the references backing up that assertion.

As you can see there is two sort of bullets in March of 1970. The second one is really the one that shows that you are really going to be using a single badge now.

In December of '74 they even used the term one badge, one area, that they were going to return to that system.

All right, so as far as what we did to try to evaluate this currently proposed SEC definition is basically, one, to do a mock implementation of it, that is in a similar way to what NIOSH did.

We wanted to go in and look at all the claimant population of the 250 days of covered employment and see how many fit the dosimetry requirements, how many did not meet the dosimetry requirements, and then take a closer look at those plans to see if there is any reason to believe that those who wouldn't meet the current Class Definition maybe would have been inadvertently excluded were this Definition to be accepted, you know, today, which, of course, it can't be, but this is sort of a test run to try to identify claimants that might be problematic, which is different than what we did last time which was really just a sample

of claimants.

We posed to look at 30 claimants that time. This time it was a lot more. So our total was 898, it's about 17 higher than what Tim said and that's just because we started our totals in August and they started theirs about four months earlier, so in four months we got 17 more claimants.

Out of those 898, 107 of those claimants did not meet the 250-day criteria in either SEC period.

I refer to them as different SEC periods, even though it's technically one Definition, just because they have different requirements and the way we went about analyzing the claims makes it easier to refer to one as the first period, from '63 to '70, or through February of 1970, and the second period or latter period of March 1970 through 1974.

Nineteen claims that we looked at really only had evidence of being at Argonne-West and/or NRF and we just had no real evidence of work

at INL, and that included from the CATI Report which really would only cover, many of the ones we looked at would only cover Argonne and they haven't even mentioned INL so we did not include those 19 in the study.

Two claims didn't have DOE monitoring records yet and that was just because they had been filed so recently that there wasn't time to get the records from DOE yet.

We could have included those but they wouldn't have told us much because we haven't even gotten the monitoring records yet.

One claim was actually withdrawn. This claim had been filed a number of years ago. It was withdrawn by a survivor prior to actually receiving those DOE monitoring records. So, again, of little value here.

Okay, so the way we're going to do this is we're going to first talk about that later period and the reason we did that is we split it up because the later period has the less restrictive dosimetry

requirements so it's a lot more efficient to be able to go through all those claims and say well here's the external dosimetry and you have 250 days therefore you meet the definition and you're done.

In that earlier period it's a little more difficult, you sort of have to go page by page to try to find a CPP dosimetry record.

So for this later period from March 1970 through December of '74 we evaluated 710 total claims. About 85 percent of them had monitoring records, so obviously it leaves about 15 percent that did not.

As far as the breakdown of the 250-day criteria almost 87 percent fit the 250-day criteria for just the latter period and 13 percent did not and the total number that met both the 250-day criteria and were monitored was about 77 percent.

So we had three observations based on the review of what we'll call the later period, the second SEC period, however you want to refer to it.

The very first observation is one thing

we noticed that the Definition itself says one film badge or TLD dosimeter.

I think that it has become clear based on your presentation that use of the annual records also counts and also they have career dose summaries, which I'm going to show an example of that, which I assume would also count.

DR. TAULBEE: If their career is during that period, yes.

MR. BARTON: Right, right. And I guess that would also extend to any, pretty much any radiological monitoring would fit, right, and if --

DR. TAULBEE: Exactly.

MR. BARTON: It's unlikely that you have internal monitoring, no external monitoring, but I suppose it's possible.

All right. So here is just an example of what one of those annual records looks like. So as we established we have '70, '71, '72 records for those years so that would count.

And here is an example of a career dose total where you can see, it doesn't go year-by-year, but it says, you know, October '69 through 1975 no dose was accrued, but we just wanted to verify that that would qualify.

DR. TAULBEE: Yes.

MR. BARTON: The second observation we actually did, we found one claim that had in vivo results related to CPP but we didn't have external dosimetry from CPP.

So we wanted to sort of highlight this claim because we feel it was pretty important because that's one of the few instances where we feel that there is direct evidence that they were at CPP, obviously, they had an internal monitoring result there, but we don't have the film badge requirement.

And I'm going to talk about this claim in a second. Oh, go ahead.

DR. TAULBEE: No, go ahead. That's good.

MR. BARTON: But I guess as we just discussed that in vivo result would be enough to qualify for the Class.

DR. TAULBEE: Well for this individual the time period is the latter time period, 1970 to 1974, so that could have been a worker was routinely badged at MTR, say a construction trades worker, and they wore their MTR badge over to CPP, got exposed, were involved in an incident and sent down to body counting for that particular incident at CPP.

And so that's part of why we expanded that Class as during that time period you can't necessarily identify this MTR worker could actually have been at CPP.

MR. BARTON: I agree. I believe in this case though we didn't have external dosimetry for 1970 and it was a claim --

DR. TAULBEE: The claim year?

MR. BARTON: Yes, for that year, or even after that, I believe. This claim actually

did not meet the 250-day criteria for that latter period but did have the internal monitoring result.

So that was -- Again, we would just, we would really like to see if there is actual records for that individual.

DR. TAULBEE: Sure, sure.

MR. BARTON: Observation 3, again, it's sort of clarification and it's how temporary and/or visitor badges are used. Based on your presentation it looks like temporary and/or visitor badges would both count.

DR. TAULBEE: Oh, yes.

MR. BARTON: The only reason I bring that up is often times the temporary badges actually specify a range of dates in which it was used, but that's certain the claimant favorable way to go.

Moving on to the earlier period, now this time we only evaluated 219 claims, and you might wonder why that total is so much lower. It's not because there are less claims in that period,

it's because if we already established that a claimant in the latter period met the criteria just for efficiency sake we did not examine that claim closely in the earlier period.

Now, that's not across the board. A lot of the claims that we looked at in the latter period there would be something that tipped us off as we were going through those claims and said listen, we need earmark this and take a look at it in the earlier period, whether it was something in CATI or as you are going through trying to find dosimetry starting in 1970 you notice that there is some evidence they were at CPP, and usually that was in the form of like what they call a location file card, which this isn't necessarily a dosimetry result but it shows where you are assigned and usually gives a range of dates and sometimes indicates if you were assigned a temporary film or it will say something like "To TLD" in the margin and that gives the contractor and the area and a time period.

So that's a very useful piece of information because that gives you direct evidence of where a worker might have been assigned.

So out of 219 claims that either didn't meet the qualification in the latter period or was just solely evaluated in the earlier period about 30 percent had 250 days and monitoring results at CPP.

About 47 percent were monitored but we did not have a CPP badge to allow for them to be included and about just under 12 percent were not monitored at all during that earlier period.

Then we have this curious other category. I'm going to go through a couple of examples of these, one of them being the CADRE description, another one being we had some claims that did not meet the 250-day criteria say in the first period but if you combined it with the second period now you have 250 days, which is interesting.

I can say that the number of those was right around ten I believe, so there were not a lot

of them, but they would be affected by the revisions of the Class Definition, obviously.

And the last category has to do with claims that we sort of earmarked for further investigation with the site.

So we have one additional observation related to this earlier period and it relates to what I just said, the location known as CADRE.

MEMBER ROESSLER: Could you, I couldn't find that acronym anywhere, what is that? Don't know either?

MR. BARTON: I couldn't find it either. Now I'm going to show the reference that I found it in on the next slide I believe. Yes, here it is.

It's a little hard to see, but this was essentially a pretty extensive list of the area codes used at INL. You can see down there Area Code 71. The area description is CADRE and it says "believed to be located at CPP."

I could not find any through references

in the SRDB or elsewhere to say if that stood for something or --

DR. NETON: Bob, what is the source of this document that you are showing?

Well I mean is that an Idaho report or --

MR. BARTON: Yes, I believe the heading at the top was that it was compiled at Idaho.

DR. NETON: More recently or --

DR. TAULBEE: Well we captured them in 2011.

DR. NETON: No, I understand that.

DR. TAULBEE: But there are lots of different -- How do I put this? Well I think the key words here are "believed to be located at CPP," we don't know who added that or what gave them that impression.

DR. NETON: That's what I was wondering. Yes, and if this was written in 2010 I mean, yes.

DR. TAULBEE: In doing some digging a

little more on this is that this is a dosimeter printout that we've got that has CADRE up here for the contractor area and it's Area 71, right here, which is what Bob is going to be getting to, but there area is actually listed as ERC which I think is the Emergency Response Center.

And in looking at the five people that you sent me yesterday, thank you very much, I could go through more details, and to give a little bit of a breakdown of those -- actually, do you want to go on with your part. I'm sorry.

MR. BARTON: Well it may be a good time to discuss this issue.

DR. TAULBEE: Okay. One of the individuals was a meteorologist in that time period and his locator card actually had Code 71 listed as Test Area North, which I don't believe to be correct.

Another one was a communication specialist, which makes sense if you've got an Emergency Response Center. Another was a guard

for the Warning Communications Center, which is also pointing towards an Emergency Response Center.

And another of the, the fourth individual there was one of the SL1 responders, one of the guys who went in and got a very large dose and he was part of this group as well, which makes sense from and emergency response standpoint in the 1962 to '66 time period.

After the SL1 accident in '61 you would want some of your experienced people working in the Emergency Response Center. That's what I believe it to be. I don't have any proof right now other than this ERC.

There are some other documents, dosimetry printouts that I went through this morning in following this up some that points to October of '63 the Code 71 doesn't appear, November of '63 it doesn't appear, December of '63 it does appear and it's listed as ERC CADRE.

MR. BARTON: Do we know where the

Emergency Response Center would have been?

DR. TAULBEE: I didn't even get a chance --

(Simultaneous speaking)

MR. BARTON: -- where it's believed to be at, it might have been at CPP.

(Laughter)

DR. TAULBEE: I'm having trouble believing it would be at CPP.

I believe it would be CFA but I don't have any proof of that, Central Facilities.

MR. BARTON: Okay.

DR. TAULBEE: But that's where we currently are, but we can certainly follow-up some with the site associated with what this CADRE means.

What's interesting to me when I looked at the term is I immediately thought military personnel, because if you read all of the SL1 reports every reference in there to CADRE were to the operators of SL1 and they were referring to the

military folks that were there.

However, the five people that Bob identified and sent over yesterday they are not military. One of them though is of the U.S. Weather Bureau and he is not the meteorologist.

He is not AEC, but on the dosimetry report he is listed as AEC but his employment is clearly the U.S. Weather Bureau stationed at INL.

DR. NETON: Can you put that sheet back up, Bob, the -- it almost seems like this was an acronym though because everything is correspondingly capitalized. It's an acronym.

MEMBER ROESSLER: If you go on Google and look it up, just CADRE says a special group of people.

(Simultaneous speaking)

DR. NETON: Yes, it kind of makes you think that but since this is all caps it looks like an acronym because --

MEMBER ROESSLER: Yes, and we think it's --

DR. NETON: -- everything else ANP, NRF, and they're not, they are not capitalized like ECF is.

DR. TAULBEE: Like on this report though it's ERC CADRE.

MEMBER ROESSLER: Hmm. What's ERC stand for?

DR. TAULBEE: I believe it's Emergency Response Center.

DR. NETON: That still could be an acronym though like something response --

MEMBER ROESSLER: It looks like it has dose --

(Simultaneous speaking)

DR. NETON: Wonder if somebody at the site might be able to --

(Simultaneous speaking)

DR. TAULBEE: Well I plan on asking Marie Hill. She was the one who was out there at that time picking up dosimetry, so I believe -- And she is the one who you will see on many of the forms

as the site point of contact for approving the dosimetry printouts that we get.

MEMBER MELIUS: Is that the Marie that's listed on this?

DR. TAULBEE: Yes, yes.

MR. BARTON: Yes, I guess my only point there was that if it does turn out that that location code or designation is associated with the CPP, to establish that we have all those records as well.

So that's the only reason I really brought it up and from, when I looked at it I only found five claims.

That doesn't mean there is not more than five because all those claims that we analyzed in the latter period I wouldn't have gone through to see if they had individual dosimetry that said CADRE.

DR. TAULBEE: Right.

MR. BARTON: But we did find those five in the earlier period. Okay, so --

MR. FITZGERALD: This is Joe Fitzgerald. If you Google Idaho National Lab and CADRE in capitals there is a CADRE Staffing, Inc., which is a subcontractor.

MR. BARTON: Oh.

MEMBER ROESSLER: Huh.

DR. TAULBEE: Interesting, okay.

CHAIRMAN SCHOFIELD: I think I have one quick question on that.

If these people are like emergency response people they could have well been badged out of CFA like you say, but any time there was any type of incident that went on they could have well spent a day, two days, three days at CPP without having an exchange badge because even though they are in this early period where you have one badge, one exchange I can't imagine in an emergency response situation you're going to stop and switch badges.

Their badge would probably cover the entire site I would imagine so they can go in where

they need to be.

DR. TAULBEE: We can ask that question.

CHAIRMAN SCHOFIELD: Okay, thanks.

MR. BARTON: Anymore questions before we move on? Okay. Now this slide is a little outdated based on Tim's presentation but we just wanted to make a few comments about the cases that NIOSH had identified for further evaluation with this site.

It was originally ten claims, as was discussed earlier, it's down to seven. And we took a look at the ten claims originally that were designated for further investigation and we came up with pretty much the two types of rationale that appear to be used to select those ten.

One of them was direct evidence of assignment at CPP and that's generally just there was an entry in a location file card that indicated they were assigned to CPP and it may be that we only have the career dose summary or we only have the annual summaries for that worker, so that will be

one we want to follow up on. We weren't able to find them in the supplemental records that we already have.

And the other one, which is sort of not a strong connection but very interesting and we actually took a very similar approach, is that more anecdotal evidence was used, such as statements that were in the CATI or in the initial DOL application a lot of times there is information in there that is not included in the CATI report I guess just based on the order of events that happen and a lot of times CPP is mentioned in those documents.

So that's sort of a less direct piece of evidence and most of the time, unfortunately, there is no direct dates associated with them where you could say, you know, the claimant specifically says that they were at CPP in such and such timeframe, and sometimes that can be a little off, as the example that was talked about earlier.

So here are just a few examples of that

from the NIOSH original set of ten. The first one was trades worker, their external monitoring ended in 1962, so before the proposed SEC Class even got started.

The CATI does list CPP as one of five different work locations at INL, but also described an incident, and in this case they gave a timeframe of about four years, 1963 to 1966, and that's all from the CATI Report.

Another example is a radioecologist, and we only have the career doses for that claimant, in this case a direct piece of evidence in that the location file card lists CPP in the later SEC period and the CATI with the survivor notes that they worked all over the site, which doesn't specifically mention CPP.

But you'll come across that in a lot of these cases where, especially where the interview is done with a survivor when they don't necessarily know when and where they worked but they knew they were all over the place. It's a very common

statement to come across.

And the third example here is an engineer. In this case the location file card does not indicate any CPP and there is a lot of internal and external monitoring at other INL locations, but in this case the DOL initial case the claimant listed ICPP and that's Idaho Chemical Processing Plant.

So this is a case where we actually in the records we don't really have any direct evidence of work at CPP, but it was selected to be followed up on because the claimant said they were there, but not necessarily giving dates of when they were there.

DR. TAULBEE: That first one I believe is the one that I was talking about where his employment actually goes back to 1961 where we did find the dosimetry at CPP in '61, so the incident that he described I believe happened in '61 is what I believe that one was.

MR. BARTON: Okay. I guess what I

wanted to point out here is that it's not just the rock solid evidence that was used by NIOSH.

As far as we can tell in selecting these claims and that a lot of times it will just be something said in the CATI or in the DOL initial case that sort of triggered that claim to be qualified for further investigation with the site.

All right, so moving on to the cases that we selected for further evaluation. We started with 23, two of them had already been identified by NIOSH so we didn't touch those anymore.

Ten of the 23 we went into the supplemental hard copy records we have, that's the CX data and the log books that might not necessarily be in the claim files themselves, and we were able to find ten of those 23 in those records.

So that left us with 11 and that's really where we stand right now. So SC&A has 11 selected, NIOSH has seven, so 18 total as Tim pointed out.

And a couple of examples here, one was a trades worker. They weren't monitored externally, at least according to the records, until 1975.

It does state that badging was intermittent, but the CATI described an incident at CPP in the early 1970's, now whether that could be 1975 or later or if that's misremembered or not we really don't know.

But it's, again, one of those things where the claimant said it so it kind of peaked our interest to see if there perhaps are other records out there that we don't have.

Another one is a driver, location file card and external monitoring for locations other than CPP, but there is an in vivo questionnaire, and this is something to give you, I don't know what time period they used this, it seems not really consistent to be honest when I was looking at the record, but basically it's a questionnaire that asks, you know, what other sites you've worked at

and have you worked at another location at INL prior to this in vivo result and they had written in, yes, CPP for 18 months, and that was in 1967.

Now it's possible that that 18 months fell within the SEC period, it's also possible it was before if we don't know when that 18-month period of employment occurred.

The actual in vivo result I believe was labeled for Test Area North for a different site, but when they asked where else have you worked they said CPP.

Another example is trades worker, and this one, this is Observation 2, and this was an in vivo result for CPP. The external dosimetry ended in 1960, so there is that piece of information I was lacking earlier.

CHAIRMAN SCHOFIELD: Okay.

MR. BARTON: And this particular claimant does not have 250 days in the latter SEC period when this in vivo result took place, but it's still important I think to establish whether that

person was at CPP and was monitored and those records may be out there we just maybe don't have them.

So just to kind of summarize this up, several of our observations were really just clarification points, the use of the annual career records when you don't necessarily have an individual dosimeter for that later SEC period and the use of the temporary and visitor badges, which is I feel very claimant favorable.

And I say here there is a combined 21 claims, that number is now 18, that were identified by both NIOSH and SC&A for further investigation.

That ends my presentation. I'd love to entertain any questions.

CHAIRMAN SCHOFIELD: Okay, I've got a question for you. A lot of the AEC employees in particular would not necessarily be assigned to a particular area because of their job.

They could easily be all over the facility. They might spend a few days in one area

or in one building or even a week doing audits, whether they're safety material audits it does not -- Have you looked at the records specifically for the AEC employees at that time?

MR. BARTON: Specifically targeting AEC employees, no. As I kind of -- We really tried to look at almost every claim.

We ran out of time to do that, but we did look at every claim with 250 days that we had, so that would include I guess any AEC employees in that list, right.

DR. TAULBEE: We haven't looked at it, you know, from a systematic standpoint. But if you go through the temporary badge reports you'll see AEC personnel all over the place, where they are coming from other areas coming into CPP they picked up a CPP badge in that early time period.

Now from 1970 to 1975, no. They probably could wear their, well they could wear their AEC badge right on in to CPP, which is why anybody monitored at the site is included as part

of that Class.

But in those earlier years, '63 through 1970, you will see a lot of AEC people coming in as well, as a lot of Phillips people coming into CPP specifically.

CHAIRMAN SCHOFIELD: Okay, thanks.

MEMBER ROESSLER: Bob?

MR. BARTON: Yes?

MEMBER ROESSLER: Somewhere in you report you state that SC&A finds this new definition and I put this in quotes "effectively split," so we are agreeing that that's a very workable definition, and then you go on to discuss some claims that need further investigation.

I am wondering what the Work Group should present to the Board at our meeting next week? What is your recommendation? You're probably not just going to leave it like that, what is your recommendation?

MEMBER BEACH: And can I add on to that, what percentage in your review would be missed of

potential claimants? Is it 1 percent, 5 percent, or do you think this covers it 100 percent?

MR. BARTON: Oh, I think it --

MEMBER BEACH: Because I am interested in 100 percent.

MR. BARTON: Right. We did not review in depth 100 percent of the claims. Like I said, we first evaluated the latter period because it had less stringent dosimetry criteria and it was a lot easier to sort of be able to pick out which claimants would fit the SEC Definition and which ones weren't.

MEMBER BEACH: Right.

MR. BARTON: The ones that weren't sort of went into the next step of closer inspection.

Now the ones that we missed that would get you to I guess 100 percent verification, at least from SC&A's analysis, would have been claims that met the SEC criteria in the latter period but were also employed in the prior period and may --

We did not go back and see if they would

also qualify based on the dosimetry requirements in the earlier period because they had already qualified for the latter period. That's certainly something we can do to get to 100 percent.

As it stands right now these, the 2 percent list that we have, the 18, and as you can see from some of the examples I feel that both NIOSH and SC&A turned over a lot of rocks here, because some of the claims that we identified for further evaluation we have lots of dosimetry for them for other areas.

And it's maybe just a statement in the DOL initial case or, you know, CPP is listed among a bunch of different work sites. We said well, you know what, maybe that's enough that we need to go back and look for it.

As far as what my recommendation would be I think until we hear back on those 18 we're not going to really know. A couple of different things can happen.

The site can go look at those 18 workers

and say well, you know, hey, we found more CPP records, which, you know, would obviously be troubling, or they might come back and say no, we just don't have any evidence they were at CPP.

And eventually it, unfortunately, becomes a judgement call as to what level of I guess uncertainty is acceptable when you are talking about a Class Definition like this.

I mean there is always the chance you could miss somebody. I would say these 18 candidates that we have sort of jointly picked out represent the most likely candidates for a claim that would have been missed if this Class Definition were accepted today.

DR. MAURO: Bob, this is John Mauro. Given those 18 which formed this ambiguous area that requires further investigation, given that they remain in an ambiguous area is it NIOSH's intent to then assume that they were in fact, belonged in the covered group, notwithstanding the fact that this in fact has ambiguity regarding that

and does that somehow solve the problem?

MR. BARTON: I think what he is saying is if you had a claimant who said in their CATI interview that I was at CPP but we don't have any necessarily evidence or monitoring records that would allow it to fit the Definition, would it be enough that they stated they were there to be included.

MEMBER ROESSLER: And that was one of my questions, too, is you talk about recommending that any evidence other than this external monitoring be accepted and certainly bioassay and other concrete things.

If this SEC went through and then a claimant came in that didn't have that film badge or TLD evidence what other things could be accepted, like the CATI, what is the fallback on that, you know, what would happen at that point?

MR. BARTON: We're not really in a position to --

(Simultaneous speaking)

DR. TAULBEE: Well, I mean my -- the Department of Labor is who makes that determination as to whether somebody is part of the Class based upon this.

MEMBER BEACH: Right.

DR. TAULBEE: And really, to me, it's part of a weight, you know, of an evidence thing. You know, I can't foresee it occurring, but, you know, I am interested in the individual that he pointed out that has a 1967 in vivo count that is listing CPP and no monitoring records, but that's -- I mean those are some of the follow-up here.

I mean certainly a claimant-favorable approach would be to go ahead and include these folks as part of the SEC Class, but, yes, I think that is DOL's interpretation here, because we are talking about a very small fraction of the Class that we have evaluated here.

And recall that the actual people who we're having a difficulty estimating the dose are those production construction trades workers, who

went into CPP and were doing the remodeling during this time period when they were doing that separations activity.

Some of the people here that, you know, that Bob has listed here are interesting and that we should follow up on, but like the particular driver, for example, you know, do we think that person was actually going in and doing some of this work that they could be exposed from that standpoint.

That's up to you all to decide from that standpoint. You know, how critical are some of these? The radioecologist who is going around and taking samples outside. You know, if he was outside the fence maybe he wasn't monitored from that standpoint.

But as I pointed out to Phil those stack emissions, those fission products, carry actinides with them and we can estimate their dose.

So some of these are to try and follow up to make sure that we don't have some gap that

we didn't identify before, but as Bob pointed out we were taking pretty anecdotal evidence in order to do some of these follow-ups of, you know, somebody mentioning in a, you know, a whole list of buildings they listed CPP.

MEMBER BEACH: So you mentioned that it's DOL, it's going to be up to them, but isn't DOL going to look to NIOSH for a list?

DR. NETON: Well, but DOL, the Definition is pretty specific. DOL is going to hold to that Class Definition and it's pretty specific.

I don't think they have any latitude in interpreting that Definition to say we're going to accept affidavits or something like that. I don't think they would.

MEMBER BEACH: Right.

MEMBER ROESSLER: Okay.

MEMBER BEACH: Okay. No, I don't think they would either and won't they look to you guys for a list like they did in some other specific

--

DR. NETON: We talked about that. That was another part of this Class, right, was to provide DOL a master list or something like that?

DR. TAULBEE: We didn't agree to that with DOL. DOL felt that they could go --

(Simultaneous speaking)

DR. NETON: But they felt there was some way to look at the dosimetry records.

DR. TAULBEE: Yes.

DR. NETON: I mean they're going to rely solely on the dosimetry records, that was the agreement that we had made, correct, or discussed?

I don't know how else they would do that because that's what the Class Definition says.

DR. TAULBEE: Yes, but this --

MEMBER MELIUS: In which case having, you know, figuring out what CADRE is and some of these other, you know, people that roam around the site how they are labeled and are they really, have they been exposed and how do you determine that.

I think DOL has been, repeatedly said they will not do something based on an interview where, you know --

DR. TAULBEE: Yes, okay.

MEMBER MELIUS: Yes. So I mean I think that's always the problem with these is these sites are often much more complicated than they first appear.

But my sense is that we need to look, to understand that this may be a feasible Class Definition and it may not and let's figure out where we are after it's been pursued and I think you are pursuing and you don't have all the information back is my sense.

MEMBER ROESSLER: But if you further investigate these whatever they are 18, or 11, or whatever, claims, that's of this group of current claimants.

Will that give you, if they all are clarified would that give enough confidence to say that some others who would appear not in that group

that it's acceptable?

MR. STIVER: This is Stiver. You know, in my mind, and it may be a little premature to have this discussion, but it becomes an issue of what kind of an error rate is acceptable, you know what I mean.

MEMBER ROESSLER: Yes.

MR. STIVER: NIOSH has set the bar pretty high assuming we've got 100 percent dosimetry. Is 2 percent acceptable if you're missing 18 people?

The worst possible case at least the among the set that we're looking at and how does that, you know, affect future claimants, you know, the next one that comes along.

And it's also a question of implementation as Jim said. I mean Labor is going to take a certain Definition. We've got external dosimetry in this period, part in that period, but not -- And it's got to be something they could administrate, you know, fairly effectively.

I can't see them going to the lengths that, you know, Bob and Tim have in looking at this claimant set. It's going to have to be something implementable for them. Those are the problems that I have with it.

MEMBER ROESSLER: But when you say "error rate" that's really not a --

(Simultaneous speaking)

MR. STIVER: Well maybe that's the wrong term.

MEMBER ROESSLER: Yes.

MR. STIVER: But just they're potentially missing a certain percent of --

MEMBER ROESSLER: I think it's maybe more an unknown circumstance rather than error rate.

MR. STIVER: Right. But in a worst case it would be an error rate.

MEMBER ROESSLER: Yes.

MR. STIVER: I mean at this point we just don't know.

MEMBER MELIUS: Remember those people that are missed, or whatever we want to call that 2 percent, you know, they lose that dose.

I mean they go into the individual dose reconstruction and NIOSH is going to say they can't reconstruct their dose based on the fact that there is an SEC there.

I think the other thing that complicates this is the fact that, you know, we've got a lot of -- the whole rest of the site is still up in the air and we're just starting to evaluate it and I don't think the whole site is an SEC, you know, based on what we've found so far.

But we don't know what other time periods are going to be covered and to what extent there are other potential SECs on the site.

We have, you know, some coworker models that I don't think have even been started yet that will need to be done and may affect parts of this group.

So I mean it's pretty early yet and --

MEMBER BEACH: And the 83.14 you were talking about was for CPP also?

DR. TAULBEE: Most likely. Well it would be the CPP, yes, but it would be extended to --

MEMBER BEACH: So CPP, yes.

(Simultaneous speaking)

DR. TAULBEE: Right now, you know, we've identified, between Bob and myself, between 400 to 500 claims that we have clearly identified as part of this SEC based upon this Class Definition.

There is the potential to be expanding the Class under 83.14 as we look at the latter time periods of CPP. As Dr. Melius pointed out there is other areas still being looked at that we're not close on decisions yet.

And so I am wondering what is the cost in a sense of approving this Class Definition as it is and if we find after these 18 that we need to make an adjustment or there is some other

problem, it's changing a paper, it's changing a letter, it goes up through the Secretary.

But right now 400 to 500 people can begin to receive their compensation that we have already identified as part of this Class as we do some of this follow-up and as we discuss things over the next, well probably year or so, with the other areas, the ER addendum, ANL-West SEC.

And so, you know, we've had to make modifications before to SEC Classes. We don't like to do that, but in this case we're looking at, you know, following up 18 people and we've got 400 to 500 people that are already part of this Class that could be processed.

And to try and point that out a little bit more, DOE, to respond to 42 claims took them almost two months, so, you know, it takes a long time for these things to come through in just processing claims.

So, yes, we've still got a lot of work to do with INL from the SEC standpoint and that's

why I guess my encouragement is to consider that aspect of the 400 to 500 people that we've identified as being at CPP during this time period.

Many of them were not compensable under the initial dose reconstruction and they can receive compensation now.

MEMBER MELIUS: I would just remind you, Tim, one, is that these Definitions have invariably failed and most of the revisions we have done and that you have suggested have been because of Class Definitions based on monitoring have not been workable.

Now this may be a different site and not to say that it's totally inappropriate to, you know, recommend this, but there's a lot of history here and a lot of revisions that had to be done because they just weren't feasible to implement under that.

And, secondly, I mean in some ways you're accusing the Board of delaying, inappropriately delaying on implementing this

while at the same time NIOSH had the decision to prioritize finishing up Argonne-West and to pursue other parts of this site rather than, you know, prioritizing this Class Definition.

So I think be a little careful about what we accuse the Board of in this situation.

DR. TAULBEE: Well first I'd like to say I am not accusing the Board. I'd like that to go on record.

Second of all, the petitioner himself worked primarily his career at Argonne National Laboratory West and so that is why we prioritized our evaluation time period, and so we are trying to address the actual petitioner's concerns with his employment.

CHAIRMAN SCHOFIELD: I've got a question. You have like particularly the fire department and maybe even the guards, I don't know, if you are 6responding to something you may go in and out of CPP during that timeframe 200 times.

Given that it's an alarm or maybe a

medical situation there, they're not going to stop to exchange badges in a case like that. Do they have a blank code that goes with their job description for all areas at all times?

DR. TAULBEE: For CPP, I do not believe so. They had their own fire department, they had their own guard force, well, part of the guard force everywhere.

So from the response of incidents that are on CPP they would be responding there onsite, so they would be badged. Now is there any time where they had to bring other people in, I don't know the answer to that particular question from that standpoint.

I mean that would take a review of all of the incidents there at the site, and, yes, wow, that would be --

CHAIRMAN SCHOFIELD: I don't know if you would need to review all the incidents, but you might stop and take a look at, particularly the fire department because you may have five or six

substations but they are actually trained and cross-trained to go to other areas and be brought in other areas when there is people that are off on vacation, they're sick, whatever it is.

Even though normally -- we'll just use this hypothetical, we're going to name these stations one through four. People from Stations 1, 2, and 3, four is the CPP station, may rotate in and out of there as they are needed, but they aren't specifically badged to CPP because they are obviously trained to respond to all areas.

That's one group I think you really need to take a look at how their badging works.

DR. TAULBEE: Okay. Thank you. You can continue now.

MR. BARTON: One point, it's a great question and I knew I had seen it at least in one case. There is actually an Area Code 123 that is the all area badge.

I don't know how often it was used or it was used for a certain time period, but at least

in this document that we discussed earlier, let me scroll up and see if it has the heading.

It says 2011 inserted by area code, table of areas and codes, dosimetry, and it gives no real specific information that was captured at INL, but this is the list of all the area codes, 123 was one of them and that is the all area badge.

But, again, I don't know if that was implemented throughout the site history, if it applies to parts of the SEC period, all of the SEC period, I don't know.

DR. TAULBEE: I am believing that that was implemented around the '70s time period, but we can check that.

MEMBER ROESSLER: Do we have any precedence at any other site where an SEC has been approved that's similar to this, not the split and Definition so much, but the need to validate the Class Definition like we're trying to do here, have we done that before?

MEMBER BEACH: No.

DR. NETON: Tritium at Mound.

MALE PARTICIPANT: Tritium at Mound.

MEMBER BEACH: Yes.

DR. NETON: We use tritium monitoring at Mound to establish the Definition of the Class.

MEMBER BEACH: And we had some issues with it that's why --

DR. TAULBEE: Right. We had to add two years where we had a gap.

(Simultaneous speaking)

DR. NETON: It was a tritium --

DR. TAULBEE: Whereas --

DR. NETON: Yes, to see who is exposed to --

(Simultaneous speaking)

DR. TAULBEE: There had been a precedence set for that type of description.

MEMBER BEACH: No. We had a group of people that weren't covered which came out after the Class Definition.

MR. STIVER: Over a 2-year period.

MEMBER BEACH: Yes.

DR. NETON: We modified that Class Definition, I think, based on the availability of records. We finally went back and there was a piece of the records that were missing and I forget what year --

MR. STIVER: Right, a 2-year period.

DR. NETON: Yes, a 2-year period.

MR. STIVER: Right.

DR. TAULBEE: Which was one of the reasons we did the whole data gap analysis and going through and looking to make sure that that didn't happen again.

MEMBER BEACH: I haven't heard of any concerns since we did that either.

MEMBER MELIUS: No, I haven't either.

MEMBER BEACH: Nothing has come through. So maybe we should take a little break?

MR. KATZ: It's 9:59.

MEMBER BEACH: I know, they're breaking down though.

MR. KATZ: Do folks want to -- need a break?

Okay. So we'll break for, what, ten minutes say, so till 10:10.

(Whereupon, the above-entitled matter went off the record at 9:59 a.m. and resumed at 10:12 a.m.)

MR. KATZ: Okay. Welcome back, everyone. We are ready, we're online, we're live. Live as we'll ever be, as John says.

CHAIRMAN SCHOFIELD: Are there any remaining questions for Tim? Does anybody have any more, while we're beating him up?

MEMBER MELIUS: Yes. Tim and I had a walking-across-the-lobby conversation, but -- so let me just ask for the record, the timeframe on resolving these cases? In terms of getting information back, and so forth, for these.

DR. TAULBEE: For the 18 cases, I expect that we will get them back by the end of this month, by the end of November. To turn those

around, two to three weeks is what I'm thinking, which puts us right into Christmas. But we should be able to have, you know, an update to the Board by that time period, probably right around Christmas or maybe -- that time period.

The other questions that Phil was bringing up on emergency responders and some of the other things, those are going to take a bit more time in order to do follow up. So I don't have an estimate. Depends upon what we can find within the current --

MS. LIN: Hey, Tim.

DR. TAULBEE: Yes?

MS. LIN: This is Jenny Lin. Can you move the microphone closer to you?

DR. TAULBEE: Okay. Is this better, Jenny?

MS. LIN: Yes. Better. Thank you.

DR. TAULBEE: Okay. With regards -- just to recap, with regards to the follow up of the 18, the sites I believe will be able to get us the

responses back by the end of this month, and then both us and SC&A will -- you know, we will have to process and evaluate those and go through those records in order to make some determination. So I would expect that to probably take two to three weeks' time period.

With regards to some of Phil's questions, with regards to emergency responders and the Area 123 badge and CADRE, that might take some additional effort out at the site in order to follow up. And I don't really have a good timeline for that from that standpoint.

MEMBER ROESSLER: As a Work Group Member, I'd like to make a suggestion to get this moving. Not a motion but just a suggestion to see what you're thinking. You know, we could pick this Definition apart for a long time, and it seems like it's going to be months anyway, and it could be even longer.

And I'm thinking of those hundreds, four or five hundred, maybe more, people who could

be compensated now. And if we don't, in the meantime, there are people who really aren't well, I'd like to see them compensated now. We've got it set up. We can always go to the fallback on it, and we have a precedence for that.

So I just want to throw that out as a -- what I think is a very -- at least I can support a valid way of approaching this with the Board next week.

MEMBER BEACH: I guess I don't disagree with that suggestion. However, I like 100 percent, but that's what I wanted. And these split Class Definitions I know are touchy. I also know they are workable in a lot of ways, too. So we sampled, what -- what did you say, 92, and came up with 18 potential problems?

MR. BARTON: No. The 92 was related to a different study. In this one, we essentially looked at every claimant that had 250 days of covered employment.

MEMBER BEACH: Oh, okay. So every one

of them.

MR. BARTON: Right. Well, the ones we didn't look at were the ones who could not qualify based on their employment. But even then, as I noted in the presentation, we looked at a bunch of those as well.

MEMBER BEACH: And how did the guards fall out in that? Are the guards covered with their dosimetry, or --

DR. TAULBEE: I see a mixed batch. The guards at CPP, yes, we see guards that have CPP badging. We see guards that have Test Area North badging. We see guards that have Central Facilities badging. So I believe the guards that were at CPP are included in that particular Class. You know, follow up with what happens when a firetruck comes, you know, they need an additional, you know, engine, I don't know.

I do know an instance in the 1970s where one of the initial follow up people that we were following was a firefighter from Central

Facilities who indicated work at CPP, and was not badged at CPP, he was badged down at Central Facilities, but this was in the 1973/'74 time period. So he didn't need to be badged in CPP, and he talked about responding to spills, and so forth, up at CPP.

But that's in that time period where everybody was allowed, which is why I say it is going to take a bit longer to follow up those, because we are looking at that time period of '63 through 1970.

CHAIRMAN SCHOFIELD: I have to agree with both Josie and -- that 100 percent is what we need to achieve. But, in the meantime, how many people are we, you know, stopping? My feeling at this point is go ahead and recommend it with the caveat that, as more data comes in, we may need to reopen that and make some changes to it.

MEMBER ROESSLER: So moved, as part of the Work Group.

CHAIRMAN SCHOFIELD: Jim, you've got

any --

MEMBER MELIUS: Well, I think we should wait. I mean, I think it's -- we're actively investigating a number of cases. I keep getting -- hearing more doubts from -- and more questions coming up than certainty about the covered and not covered, and so forth.

And, remember, once we -- you know, once we approve it, then this will go to the bottom of the priority list. And the way the priority list looks for investigating the site, we are potentially years away from getting anything done. I mean, it's the nature of the way this site has been approached and the amount of work that needs to be done on the site.

What I had talked about with Tim, while we were going across the lobby, was that we will have a report the end of -- by Christmas, nice little bow on it and under the tree, and so forth.

DR. TAULBEE: I can't promise by Christmas, but around then.

MEMBER MELIUS: Well, East Orthodox Christmas. It'll give you an extra week.

DR. TAULBEE: Support staff is all on leave the second half of December.

MEMBER MELIUS: Okay. Cancel all leave at ORAU.

MEMBER ROESSLER: So, Jim --

MEMBER MELIUS: Let me finish up.

MEMBER ROESSLER: Oh, okay.

MEMBER MELIUS: We have a Board call on January, about the 20th, something like that. And if we have a report by around the holidays -- okay, how is that? But then we have the Work Group call in early January and see where we are then.

If we feel that we have enough information at that point in time, then we can go ahead and decide to approve or decide to hold off, you know, what we -- in terms of recommendations to the Board.

MEMBER ROESSLER: My question of Josie and Jim, then, is when you say want 100 percent,

do you want 100 percent clarified on these 11 cases, is that your goal? Would that make you feel --

MEMBER BEACH: You know, I guess what I really want is a more clear recommendation from SC&A. And it doesn't sound like SC&A is quite ready to give that clear recommendation to us. Am I correct in that?

MR. BARTON: I think that -- I'm sorry you have to these 18 plans and then what comes with those. If we get more records, then we can evaluate the position then.

One comment I would make on the Definition itself -- you know, there was some discussion about how we approve a Class and it goes to the Department of Labor. You know, they're by the book, they're going to stick to that Definition.

And it seems like a lot of discussion today pointed to maybe expansion beyond just the notion of the one film badge, at least for the latter period, March 1970 to 1974. As we talked

about, that would include temporary badges, visitor badges, the annual records, career dose totals, maybe even some internal monitoring.

So it almost seems like the requirement, as it's being discussed now, is not necessarily just that one film badge, it's more evidence of radiological monitoring, it seems like what was discussed.

DR. NETON: I think that remains to be seen. I mean, you can ask questions about that.

MR. BARTON: Right.

DR. NETON: But if it works out that those questions are addressed, then maybe it's a little quicker than --

MEMBER MELIUS: And DOL does an implementation guidance on the SEC. So the Definition doesn't have to spell out the entire -- every possibility. So, for example, if we determined that CADRE was part of CPP, we don't -- I don't think we have to necessarily change the Definition, but we -- you know, the implementation

guide would -- you know, that's a subset within CPP, or something like that.

Or, you know, if -- it would -- if it involved other monitoring or whatever. I mean, I think there's ways to do it. It depends on what the exception is.

Now, if it's like, you know, firefighters who say they worked in CPP, DOL is unlikely, I think, to implement based on sort of say so or whatever, or, you know, what's in an interview. But, you know, if it's, you know, records, if there's a determination now or later that, for example, the, you know, emergency response teams rotated through in a way, or might not have been badged in CPP, you know, that group could be added as an expanded Definition or something.

I mean, I -- I don't want -- you know, in the abstract, it's a little hard, but I think, you know, it depends what the evidence shows. So --

DR. TAULBEE: And in that latter time period, you know, as we indicated, anybody who is badged -- because you still have to wear a badge to get into CPP, so -- especially in that latter time period. The badge could come from anywhere. And so it -- it really doesn't matter from that standpoint.

The earlier time period is where it is more restrictive to where people coming from other areas had to pick up a CPP badge to go in. But, again, everybody going into -- everybody who has the potential to be exposed to those actinides that we talked about, those separated actinides, had to be badged to go into those areas.

MR. BARTON: I guess this is what I was kind of hinting at is would internal monitoring, without an existing badge, however unlikely that situation is, if we found at least one that appears to be like that, that we recommended it be followed up on. We might find badges from that individual.

But, again, with the internal

monitoring also -- as a follow-on to that, some of the cases we identified for follow up had direct evidence via the location file cards. I know that's not an affidavit or a statement made in a CATI report. That would be what I consider a solid record.

Would that be enough, if it comes back that we have some -- a few of these 18 had location file cards, and we can't find external dosimetry-specific -- not specific to CPP, but if we can't find external dosimetry to cover that latter period, would that be enough? Because that's not necessarily monitoring, but it is in a way evidence that they were assigned to that area.

DR. TAULBEE: My interpretation is that is enough from the evidence standpoint, because that locator card is actually from the Dosimetry Branch. It's not from Human Resources. It's their record. And so that locator card is where they would issue badges and where it goes from.

Now, the only possible scenario I can think of of the individual who, you know, went for a whole body count. And, you know, there isn't a record yet right now is that if a new employee, for example, goes for a pre-employment in vivo counting, and then actually decides to never work there, it would be on their locator card. That's not the scenario here, but --

MR. BARTON: Oh, yeah.

DR. TAULBEE: But I can actually see that happening, where they didn't get issued a badge. But they're not going to meet the 250 days either, so I don't know if that scenario is --

MEMBER MELIUS: I would add one other thing, is that I think when there are exceptional or different circumstances, I think it's important that the Board put that on the record when approving the SEC, because that adds more weight to how, you know, DOL interprets the SEC. And so, again, having an understanding of what -- how it should be implemented and what might be sort of

tricky questions, what the different circumstances would be, I think is helpful and should be part of the part of the Board deliberations.

And the obligation of the Work Group is to, you know, make sure that stuff gets explained in some way on the record, either as part of a Work Group meeting or a Board meeting.

MEMBER BEACH: I agree, because it's not real clear how that is going to be turned over to DOL, whether NIOSH is going to provide a list or if they are going to go through the records. That is a huge part of this, at least it seemed to be in the last one we talked about with Mound.

So I'm going to retract. And while I want to see 500 people get compensated, if Jim's argument that we get to go to the bottom of the list as importance, to me that's really not acceptable. So I think waiting a couple months is not a bad idea to make sure we're all clear, and we have a more clear recommendation coming from SC&A. I think that's important for the Board.

MEMBER ROESSLER: So my motion wasn't seconded, so it --

MEMBER BEACH: No, no. It wasn't really a motion. You were just throwing out a suggestion.

CHAIRMAN SCHOFIELD: This all area code for badging, that's one that really has me questioning the 123, how that will impact this.

DR. TAULBEE: And that's something that we can look at as -- again, my belief right now is that that is in the 1970s time period where anybody badged qualifies to go in there. But we can certainly verify that.

But as Dr. Melius had indicated a second ago, that -- you know, that really is part of the implementation, you know, whether we add CADRE or whether we add the all area, whether we add the firefighters, that is part of the implementation.

Now, if you're wanting all of that guidance by the end of December, I can't deliver all of that. So I guess I'm asking -- we can do

the 18. When are you wanting the other aspects?

I'm very glad Jim pulled out his notebook, so that he can take notes, because I'm not a prioritization person.

MEMBER MELIUS: I mean, I think some of that depends on where we are when we see the 18. And I'd like to think it's going to be definitive, but I'm not confident that it will be. But, I mean, our next meeting would be March. Is that feasible? I don't know.

DR. TAULBEE: Actually, yes, I think that is feasible.

MEMBER MELIUS: I mean, I think -- my guess is that -- Tim, is you're going to know when you get the records the end of November. You're going to have a pretty good sense of what is there, particularly if there's problems. I mean, that's --

DR. TAULBEE: Yeah.

MEMBER MELIUS: -- you're going to know and --

DR. TAULBEE: But with the firefighters, I'm not going to know.

MEMBER MELIUS: Yeah.

DR. TAULBEE: I mean, I'm going to have to do some additional requests in order to get that is where --

MEMBER MELIUS: Okay.

DR. TAULBEE: -- is what I'm going at.

MEMBER MELIUS: Yeah.

DR. TAULBEE: As I would have to look at that more in detail, and that's --

MEMBER MELIUS: So let's say March for that, is that --

DR. TAULBEE: For that aspect.

MEMBER MELIUS: Yes.

DR. TAULBEE: Okay.

MEMBER MELIUS: Sure.

MR. KATZ: So just to clarify, does that mean we are not going to shoot for a Work Group meeting possibly in --

MEMBER MELIUS: I think we can --

MR. KATZ: -- in January, or we still will?

MEMBER MELIUS: We are. We are.

MR. KATZ: Okay.

MEMBER MELIUS: I mean, I -- that's my proposal. You're supposed to remind me, Ted, I'm not the Chair of the Work Group.

DR. TAULBEE: So for the 7 NIOSH and 11 SC&A orders, the 18, we are targeting around the end of the year holidays, and then a January Work Group.

MR. KATZ: Right.

MEMBER MELIUS: And with SC&A being able to comment on that report, but not necessarily a written, you know, response from SC&A by the time the Work Group will --

MR. KATZ: Well, SC&A will have access when you get the records.

MEMBER MELIUS: Oh, absolutely.

MR. KATZ: You don't have access early on before, but --

(Simultaneous speaking.)

MEMBER BEACH: John has already asked to have those records made clear where they were. That's --

MR. STIVER: That's a little bit different, regarding the records, but, yeah, we will definitely want them as soon as you can get hold of them.

DR. TAULBEE: Right.

MR. KATZ: Tim, are you saying you're not looking at the other 10 or --

DR. TAULBEE: I wasn't going to on the other 11.

MEMBER MELIUS: Can you at least coordinate on -- that's a good point. Can you at least coordinate with SC&A on how we look at it?

DR. TAULBEE: On our original list, I accidentally dropped it, so --

MEMBER MELIUS: Bob has like 11 people helping him, and you only have one, so --

(Laughter.)

MR. KATZ: Phil?

CHAIRMAN SCHOFIELD: What does the calendar look like for January?

MR. KATZ: We'll do this by email. We don't need to --

CHAIRMAN SCHOFIELD: Okay. Sounds good.

MR. KATZ: -- do this right now. But I'll send something out for -- I'll look at when the teleconference is and send something out before it. If we have a week before it, we -- I think we do.

So that's what I'll be aiming for, about a week before the Board teleconference.

DR. TAULBEE: So just for my general knowledge, the teleconference is the 20th?

MR. KATZ: Something like -- I don't have it in --

MEMBER BEACH: It's the 20th. I just looked it up.

DR. TAULBEE: Okay. So you're looking

around the 13th, 12th to 13th.

MR. KATZ: Yes.

DR. TAULBEE: Okay.

MEMBER ROESSLER: Probably just a teleconference?

MR. KATZ: Yes.

DR. NETON: The Board teleconference --

MR. KATZ: Gen meant the Work Group, yes. We'll just meet by phone.

MEMBER MELIUS: After the big blizzard of January in Minnesota.

CHAIRMAN SCHOFIELD: No. You're not going to get it this year. Florida gets it. It's an El Nino.

DR. TAULBEE: By the March 4 meeting, you want us to have follow up on the firefighters and security forces.

MEMBER BEACH: Prior to the March.

DR. NETON: I mean, it may not be necessary, depending on the outcome in January.

I'm not prejudging anything. It's a staged process is what I'm saying.

CHAIRMAN SCHOFIELD: Well, Doug, it looks like you're up next.

MR. STIVER: Phil, could I --

CHAIRMAN SCHOFIELD: What's up? Oh. Sorry.

MR. STIVER: I just wanted to sort of set the stage a little bit here. Back in April, we were tasked to start looking at some of the areas where NIOSH felt that they could reconstruct doses with sufficient accuracy, and we set about doing some kind of mini-studies, if you will. A few were cross-cutting, which was looking at the OTIB-54 method of using ratios. It comported well with the different types of reactors that were in operation at INL, both in the test reactor area and also at Test Area North.

Another aspect of that study was to see how well those ratios comported with actual measurements of the bioassay that was available,

and other measurements that we were able to glean from the SRDB.

In addition to that, we were to go vertical in certain areas. One was the Central Facilities area. Another aspect was Test Area North. We were going to look at CPP, pre-1963, before the SEC analysis of the burial ground.

It turns out the burial grounds and the CPP, pre-SEC, are going to require site visits and interviews, and that's part of what we're doing now is we have an action plan in, and we're looking at hopefully getting out there probably sometime beginning of -- probably in January of 2016. That's our goal at least.

So today we are really going to discuss the reactors, TAN, the bioassay, and Central Facilities. But I'd like to mix this up a little bit, because I know Bob Barton has got an early flight, and he is going to talk about -- a little bit about the fission and activation products. So I want to make sure he has a chance to do that

beforehand.

So I'd like to bump the Central Facilities discussion to the end, and start out with Steve Ostrow's discussions of the test reactor area.

So I can go ahead and pull that up, Steve.

DR. OSTROW: Give me a minute.

MR. STIVER: Okay. Can everybody see this on LiveMeeting?

MEMBER ROESSLER: I can't hear him very well.

MR. KATZ: Well, he's not talking yet, but --

DR. OSTROW: Can you go to the next slide, please?

All right. One of the things that we looked at, we're considering that NIOSH relies very heavily on ORAUT-OTIB-0054, fission and activation product assignment for internal dose-related gross beta and gamma analysis.

So we wanted to look at, does this model well the reactors that are at INL? Are they adequately enveloped by the OTIB cases, so that the isotopic ratios that I used are valid? And have off-normal operating scenarios for the reactors been identified, and are they covered by the OTIB?

So we took a three-pronged approach. We looked at the OTIB, described Test Reactor Area reactors, and then we assessed whether the OTIB models the reactors. We started just in this case with the Test Reactor Area reactors.

And this is just -- next slide, please. And this is just a little bit of the background, and this I think is an interesting point. Under the first bullet of dose reconstruction, when you set up a Class Definition in the SEC, as part of the firm framework, you are also defining what is not in the SEC. And you are assuming that doses could be reconstructed for site areas and time periods that lie outside the SEC Class Definition.

That's what we're really looking at,

and we looked at just this one aspect of dose reconstruction applicability. That is the TRA area.

Next slide, please.

First, looking at what does OTIB-54 do, because I'm not going to go too much into the OTIB-54 procedure. But basically the idea is that it should apply to a really broad scope of reactor operations, and there is different cases.

Plutonium production reactors, which are low enrichment and low burnup; research reactors, which have like medium enrichment and modest burnup; and high enrichment, high burnup reactors. Those are really the cases that they look at.

Next slide, please.

Specifically, the OTIB does not apply to two different situations. Operations, we have short decay times following removal from the reactor, for example, radioactive lanthanum processing. And it doesn't apply to cases where fuel has been reprocessed or the radionuclides have

been separated. It really applies to either intact fuel or cases where the fuel is dissolved, but it hasn't extracted isotopes from it.

Next slide, please.

We looked at the general -- we had looked in the past at the validity and applicability of OTIB as part of the Subcommittee on Procedures Review Group, which was a long, protracted process, a lot of back and forth between us and NIOSH. And the findings were closed, so I'm not going to do the whole history on that. A bunch of reports have been done. I'm not going to recapitulate that here. It's not really germane to this.

Next slide, please.

The OTIB applies to the case where frequently you have air samplings or urinalysis data, the mixed fission and activation products, but you only have them in the form of gross beta or gross gamma activity, and it's unattributed to specific radionuclides.

So what you want to be able to do is do what you call mathematically an adjoint problem. That given the output, the result, which is the gross beta or gross gamma, can you derive the input, which is the actual exposure to the different radionuclides. That's what the OTIB tries to do. In some sense, it works backwards.

And the goal of the OTIB is to reduce the large amount of possible data that they have on reactor operations to some manageable set of a few characteristic reactors and scenarios. And the hope is that a particular case will fit in somewhere within this envelope that is defined by the OTIB.

Next slide, please.

And, just briefly, the OTIB starts with the radionuclide mix in spent fuel for a bunch of different reactor types and fuel designs, operate under different conditions. The conditions are specific power, irradiation time, and burnup, and calculated at different decay.

Next slide, please.

The OTIB starts out with seven representative reactors and -- next slide, please.

The OTIB used ORIGEN code, which is an isotope generation and depletion code. It's an industry standard. It's well-known. It was written at Oak Ridge, and it's maintained by Oak Ridge National Laboratory.

And did a whole bunch of different runs on different reactors, seven different reactors with different decay times, and produced activity data for 879 fission product nuclides and 688 activation nuclides. They went through a bunch of different steps and ended up with four characteristic reactors that are on the bottom of the page.

The Advanced Test Reactor, ATR, which is supposed to be characteristic of high flux reactors; the Fast Flux Test Facility, which is characteristic of sodium-cooled faster reactors; Hanford N-Reactor, which is characteristic of

plutonium production reactors; and, finally, a TRIGA Reactor with stainless steel cladding, which is characteristic of research reactors.

Next slide, please.

Finally, that was reduced even further using another version of ORIGEN, ORIGEN-S, which is part of the SCALE system, to produce the final characteristic nine cases, some of the -- there's multiple cases for a particular reactor. And NIOSH customarily, from the NIOSH documents, considers all nine reactor cases when it is doing the dose reconstruction. And if they don't have individual worker information, they might apply data from all four decay times, and basically pick the worst case of that. So that is -- we thought that was a favorable basis approach.

Next slide, please.

Just a list -- these are the nine representative cases for four reactors that the OTIB produced. And the goal is that if you have a particular dose reconstruction for a particular

case, that -- to go ahead and take a look at this, what the situation is, and try to pick a particular case that envelopes the actual dose reconstruction case that you have.

Next slide.

A quick look at the four representative reactors. The first is the Advanced Test Reactor, which is a surrogate for high flux reactors. And that operated at INL. In fact, it's still operating at INL. Max power of 250 megawatts, and it's the largest of the three material testing reactors that are at INL.

The idea was starting early in the nuclear industry, nuclear research, if you wanted to commercialize nuclear reactors, you needed to know how material would survive, how they would do under intense neutron and gamma fluxes. So these material testing reactors at INL did accelerated testing using really very high fluxes.

The reactor itself is a pressurized, light water reactor, beryllium reflected, uses

highly enriched uranium fuel, which sets it apart from commercial reactors. So it's fully enriched. And the fuel arrangement has very unusual serpentine curved plate configuration.

Next slide, please.

Fast Flux Test Facility -- this is a reactor that was at Hanford, 400 megawatts, a liquid sodium-cooled reactor that explored breeding plutonium from depleted uranium fuel by neutron capture in U-238.

Next one, please. Next slide.

Hanford N-Reactor -- this is Hanford. This is a plutonium production reactor, which uses very low enrichment, because you want it to maximum the U-238 content, U-238 to absorb the neutron and produce plutonium-239 following two beta decays. And you have very short irradiation times to minimize the plutonium-240 buildup.

And this is a different reactor, too. This was low enrichment and graphite-moderated pressurized water reactor.

Next slide, please.

And, finally, the TRIGA Reactor, which people are probably familiar with. They are all over the place. General Atomics produces them, and they came in different varieties. They're basically low powered research reactors.

Originally, they were highly enriched, but in the last couple of years they have only been up to about 20 percent enrichment, and the older reactors have been converted to run with 20 percent enrichment of fuel. That's for safety non-proliferation purposes.

Next slide.

Okay. Now, specifically, what's in INL, and this -- if you look at the next slide, please, this is a list -- it's a little bit tough to read because of the small print here, but this is a list of all of the radioactive facilities in the INL Test Reactor Area.

The first three are full-sized reactors. The first was the Materials Test

Reactor, which operated from 1952 to 1970. Then they had the Engineering Test Reactor, which operated from 1957 to 1981, which is bigger than the Materials Test Reactor. And, finally, the Advanced Test Reactor, which went into operation in 1967. And, as I mentioned, it's still in use. Those are -- all three were -- they were full-sized reactors.

The other facilities are either zero powered reactors that are used as mockups of the big testing reactors or other places we encounter radioactivity. So we just looked at the three -- the first three reactors, full-sized reactors. And I'll go through them one by one.

Okay. Next slide.

All right. First, the Advanced Test Reactor. In this case, it was sort of easy to do, because the OTIB itself, OTIB-54, explicitly models the Advanced Test Reactor. So it's expected that any workers exposed to Advanced Test Reactor fuel would be adequately treated by the

methodology in the OTIB.

We took a look to see if could find any important material instances of the Advanced Test Reactor operating outside of this design envelope, and we didn't find that. As far as we could find, the Advanced Test Reactor event is covered by the OTIB.

Next slide.

This is just an illustration. I just put it in because it looked nice, really. On the left it shows the operating deck of the Advanced Test Reactor, and on the right, to people who are into nuclear engineering, that's a truly weird-looking core. And they have rotating drums instead of control rods to control reactivity.

Next slide, please.

The Materials Test Reactor was designed by Argonne National Laboratory and Oak Ridge National Laboratory and sited at Idaho. This was sort of an interesting situation. Why did it end up at INL? Because there was a little bit of a

fight between Argonne and Oak Ridge where to site it, and so it ended up at INL in the middle of nowhere.

Now there's a second reactor built at that location. It's a relatively small reactor, maximum power is 40 megawatts. And, interestingly -- and we'll talk about this more later -- even though it's a uranium reactor, they actually ran it with a plutonium core at at least two different times.

Next slide, please.

Okay. The Materials Test Reactor was really a prototype for the current Advanced Test Reactor. It's cooled and moderated with light water, aluminum-clad curved plate, enriched uranium most of the time. The core is really small. It's only nine inch by 28 inch in core section by 24 inches high and only has like 4.9 kilograms of U-235.

This is a little bit of a demonstration that -- how little nuclear fuel it takes to have

a nuclear reactor. I mean, it's a really small core, but very high flux, had about 100 beam holes that penetrated into the core. So, in this case, the neutron and gamma flux was extracted to irradiate things external to the reactor.

We will see later reactors didn't do that. Rather than having beam holes, the cores are big enough they can place experiments inside the core, which was more efficient and also safer to operate, because we didn't have the streaming problem.

Next slide, please.

Lasted for a long time, 125,000 hours of operation, 19,000 irradiations. So our evaluation -- the MTR fuel enrichment, cladding, and plate design were similar to the ATR. The ATR was much bigger but a similar idea. The way MTR was operating with uranium fuel, we concluded that the ATR case and the OTIB would correctly reproduce it.

Next slide.

We looked at unusual conditions. They used the MTR briefly for Radioactive Lanthanum -- that's RaLa -- extraction campaign for a few years. RaLa is really interesting but not really important here.

OTIB specifically moved RaLa operations from the -- from being considered, so we don't have to look at that.

Next slide, please.

Okay. I mentioned before, this is where it's interesting. The MTR, although most of the time it used uranium fuel, it's a demonstration as early as 1958 to see if you could actually run a reactor with a plutonium-239 core. In theory, you should be able to. But it wasn't demonstrated, so they ran with a plutonium-239 core.

Later, years later, just before the reactor was shut down actually, I think in 1970, DOE or whoever was in charge in those days, wanted to shut down the MTR, because they thought it was obsolete, and so forth and so on, to try and save

money.

They did the last experiment called the Phoenix experiment. It was a demo project for a potential high-power, compact reactor. The idea here is that plutonium-240 is fertile, which means that it can absorb a neutron and become fissile plutonium-241.

Odd-numbered nuclides are fissile, generally, and that would have actually two things. That would -- the plutonium-240 would act as a neutron absorber initially, so they wouldn't have to load the reactor, but they wouldn't have to put a lot of control rods at the beginning.

But gradually over time you would build up the plutonium-241, which would increase the reactivity available. So the idea is you can get a very compact core that way. They ran it for a few months to demonstrate it.

And let's go to the next slide, please.

Demonstrations worked fine. But although the configuration of the core with

plutonium was similar to the configuration with uranium, these are the same five fuel sites, and so forth, the same design.

The plutonium operations were significantly different. The plutonium had a different cross-section, different activation, and so forth, different from uranium, and the fission product abundance distribution and core neutron spectrum would be different than a uranium core.

So the question is, at the last bullet, how much different and whether the differences would be radiologically significant. This would require us doing detailed comparative ORIGEN runs, which we didn't do for this report. That was a little bit beyond the question we raised to do ORIGEN too much in this case.

Next slide, please.

So we looked to see, did any of the existing four reactors or nine cases of the OTIB encompass the MTR running with plutonium core.

And we looked at the Hanford N-Reactor case, which contains plutonium, but they're not applicable for several reasons.

One obvious difference is that the MTR was water-moderated, while Hanford N was graphite-moderated, which is totally different. You get a different neutron spectrum, everything. And the actual loading of plutonium was totally different.

The N-Reactor in the first case used six percent plutonium-240, and the second case was 12 percent plutonium-240, while the MTR used 23 percent plutonium-240 to breed the fissile plutonium-241. So the fuel loading was different, but the Hanford-N Reactor case we don't think applies.

So we concluded that it's not clear which, if any, of the nine OTIB-54 cases would adequately envelope the case of the MTR with the plutonium core; hence, whether the MTR with the plutonium core could be adequately modeled with the

OTIB has not been determined at this time and is an open question.

Okay. Next slide, please.

We looked at the Engineering Test Reactor, which is similar to the MTR and the ATR, just bigger than the MTR and smaller than the ATR.

And go to the next slide, please.

This operated from 1957 until 1981, very high flux.

And next slide, please.

It's included here, as with the MTR, operating with uranium fuel, the OTIB-54 methodology should also adequately envelope the ATR in considering the internal exposure.

So last slide, please. Next one.

This is a little summary. The main issue that we found just looking at these three reactors in the Test Reactor Area is that the -- you have the question of whether the ORAU-OTIB-0054 can be applied to the MTR when it operated with plutonium fuel, and we left open the area, we didn't

look at this.

The applicability of the OTIB-54 to the more exotic reactors at Test Area North. It had different fuel compositions and arrangements and operations than the OTIB reactors. Plus, other reactors at the site, which were deliberately run to failure, blown up, so forth and so on.

So the -- we have a report that comes a little bit later in today's presentation about TAN, Test Area North area, but there are other experimental reactors located in several different areas of the INL site that have yet to be addressed.

And I think INL had 52 reactors, and all of them were experimental. And according to some INL people, they used to refer to the reactor that was new. They had at least one of every single kind you can think of.

That concludes my presentation.

MR. STIVER: Any questions or comments for Steve?

MEMBER BEACH: I guess it might be

premature for this question. What is your path forward here?

DR. OSTROW: Well, I would suggest two. One, we explicitly requested that the Materials Test Reactor operating with plutonium would be adequately modeled by the OTIB. And I think that's -- we can look at it a little bit more, but I think that's a question for NIOSH to respond to, you know, with some -- not just a "yes" or "no," but with actual -- some analysis. It may be -- you know, we need to see some write-up on that. So I will do that.

And I think the other path forward would be to take a look at some of the other exotic reactors other than the TAN, which we have already been looking at. There is a number of miscellaneous reactors, like OMRE, which is an Organic Moderated Reactor Experiment, which no one has looked at. And there's a few others that are totally different than any normal type reactors. So we should I think continue to at least identify

potential problem areas.

MEMBER MELIUS: Can I ask Tim to sort of update us on where NIOSH is going in this?

DR. TAULBEE: Okay.

MEMBER MELIUS: More than a nod.

DR. TAULBEE: More than a nod. Well, first of all, Steve, a very nice presentation there with good details, and I certainly appreciate that, because it's nice to get everybody up to speed on all the reactors. So it's nice to take that time.

With regards to the plutonium core at MTR, I have two comments about this. Number one, I would like to ask that the Work Group consider moving this to -- as a TBD issue instead of an SEC issue. And the reason that I say this is that we've pretty clearly demonstrated we can model the different reactor cores once we know what the core composition is and the burnup times and the operating parameters, as OTIB-54 had done, and then develop this fission product mix to see if it is claimant favorable or not.

This has also been done outside OTIB-54 at the Savannah River Site with heavy water reactors. An entire additional analysis was done and a comparison was done. So from my standpoint from the SEC, it's really more of a TBD issue of whether OTIB-54 is bounding, or whether we need to make some adjustments for this 19 -- January of 1970 through April of 1970 core run that they did with the plutonium core.

Now, keep in mind that plutonium core wasn't processed until later in 1970, a long that time period. So that's when the core will be, you know, dissolved, and so forth. So I would ask that you consider it from a TBD issue.

Also, with the most recent Class Definition modification of March of 1970 through 1975, all of these workers at MTR are actually included as part of the Class due to the CPP possibility of them going over there.

So those are my initial comments. We can certainly model that plutonium core and write

a report about it. I would just like to try and do that outside of the SEC envelope. It makes it a little bit easier from our standpoint to get through the other SECs at this time.

MEMBER ROESSLER: I'd like to comment on essentially the same thing Tim did. That was a very nice description of reactors. I feel like at this moment I understand them, and it really helps. When you are looking at a site like this, you need to know something. So it's done as a good teacher, I think, Steve.

DR. OSTROW: Thank you.

MR. GLECKLER: This is Brian Gleckler. I'd like to make another comment regarding the MTR's Pu core. I don't think we have any evidence that indicates that any of that fuel ever failed, so there's not likely an exposure pathway.

DR. MAURO: This is John Mauro. Regarding that comment, one of the -- this OTIB-54 approach, as I understand it, is being used for folks that handle and store fuel, and, of course,

does not apply once you start to process the fuel. So the premise is that once you move the fuel and are working with it or place it in a hot cell, there is in fact a potential for exposure to airborne radionuclides of some mix, an OTIB-54 mix.

So I think notwithstanding the fact that there is no what you had referred to as fuel failure, I believe it's -- that there is still applicability of OTIB-54 to reconstruct the internal doses for that fuel, unless I misunderstood your question.

MR. GLECKLER: The fuel was clad, so if the cladding never failed, then no one could be exposed to the material inside the cladding. And I believe that's -- I don't think we've seen any evidence that that fuel ever failed. It wasn't ever processed onsite or reprocessed.

MR. STIVER: Any other questions for Steve?

MEMBER MELIUS: I would just -- back to Tim's comment, I'm a little reluctant to sort of

write off an issue at this point. I'm not really that familiar with OTIB-54 and its applicability. As I repeatedly say, it's not just whether it's bounding but whether it's sufficiently accurate also.

But I know you meant that, so understood, but -- and I just, you know, before we write it off, I'd like to get a better handle on it. And also try and understand this whole menu of 52 reactors, or whatever it is, that -- what we're writing off and what we're not, and so forth, so -- with that.

DR. TAULBEE: I'm sorry if I implied that we were writing it off. I'm not meaning to write it off. I just mean from the SEC --

MEMBER MELIUS: I'm just personally not ready to do that, but I'm not -- I'm not trying to expedite it either.

DR. TAULBEE: Okay.

MEMBER BEACH: And you are just saying one, the MTR.

DR. TAULBEE: The MTR for the plutonium core. There are other reactors here --

MEMBER BEACH: Yes.

DR. TAULBEE: -- and I believe there is going to be other SC&A reports about Test Area North and some of the other ones. And, to me, all of them, because of our ability to identify the cores and look at the power distributions and the burnups, those are all things that we can evaluate.

It's going to take time, but it's certainly something we can evaluate. And if the Work Group wants that, that's certainly feasible and we can certainly do so and make adjustments as necessary.

CHAIRMAN SCHOFIELD: Do you have a list of the material types of plutonium they used for the MTR reactor, the levels of enrichment?

DR. OSTROW: Yes.

DR. TAULBEE: Yes. Steve presented that in his presentation.

DR. OSTROW: Right. I did it very

quickly. One of the -- yes, we have information on that.

You know, Tim, I know that -- this is Steve again. I know that you can -- you have the capability of modeling any core. I mean, your methodology is good. You guys are good at that stuff. But what would you, for example, in a practical case?

Suppose a worker worked at the OMRE reactor, which the organically moderated reactor. For his particular case, you would actually propose running from scratch the ORIGEN runs and, you know, creating a special case for that worker.

DR. TAULBEE: No. What I would propose doing is the reactors that the Work Group wants us to analyze and go through and develop the fission products inventory and compare it to OTIB-54, those are the ones that we would analyze.

What we do from a dose reconstruction standpoint, from a practical standpoint, is, for example, if I had an OMRE worker, and his dosimetry

was identifying an OMRE and his bioassay was saying it was from OMRE, then, yeah, I would apply those particular ratios to that particular person if we had -- you know, after we develop that. We would not do this on an individual type basis.

But, otherwise, we would assign -- now, let me clarify here. If that worker worked at OMRE and, say, up at MTR, we take the most claimant-favorable.

DR. OSTROW: Sure. Of course.

DR. TAULBEE: That's what we've done in the past, of which one of these --

DR. OSTROW: I noted that. I remember from our OTIB-54 discussions, and what you guys wrote up, that you always run multiple cases and pick the worst case for each worker.

DR. TAULBEE: Right. Ideally, OTIB-54 should be the bounding case. It should be, because of the variation within the reactors and some of the parameters that were investigated.

Now, when we did the Savannah River

analysis with that, what we found was the iodines were not necessarily. And so we had to do some special modification for the iodines for the heavy water reactors, which really only applies, then, to the thyroid cases. So --

DR. OSTROW: Right. Now, I realize that. I know that you did that.

DR. TAULBEE: We would apply the same way.

DR. OSTROW: Okay.

MR. STIVER: So this is John Stiver. So I guess my question to the Work Group is, is this something you would like SC&A to take a look at to identify which reactors we think might be candidates for follow up for NIOSH?

MR. KATZ: Let me add to that, before we get into that, whether SC&A -- it's unclear to me whether that's an SC&A role or NIOSH to identify, suss out, those that may not be enveloped, because it seems like, I mean, SC&A has raised these possibilities that it is discussing today.

But in terms of canvassing the whole site for -- to ensure that the reactors are covered in effect, I mean, it seems like that is more of a -- that's part of -- NIOSH has to do that anyway, because it has to ensure that all of its dose reconstructions are claimant-favorable. Or is that something that NIOSH does only as the cases come forward that are apparently needing that? Is that -- how does that work, I guess is my question.

DR. TAULBEE: Well, our general presumption right now is that OTIB-54 is bounding based upon that's its job. That was why we did OTIB-54 instead of doing the reactor analysis at all DOE sites and all, you know, 200, 300 reactors that were ever made.

And so the issue is being raised to me by the Work Group of, is this valid? And so, you know, to me, the Work Group identifies which ones they have a concern about, and then we can go do, I mean, unless Jim wants to overrule me and say we're going to do all 54. This is a tremendous

amount of work.

MR. KATZ: No. I believe that. I'm just trying to understand, because it sounds like there are some questions about whether it's bounding on these reactors, and I just would have assumed that NIOSH would had addressed questionable reactors because you have -- otherwise, you are just sort of running on an assumption that OTIB is good, but you haven't actually closely looked at each of the reactors. I'm just trying to understand where the --

DR. TAULBEE: That is correct.

MEMBER BEACH: So aren't you using another OTIB in conjunction? I thought I read like 60 -- there was another one that would be used in some cases. Or are you saying that all 52 reactors are going to be covered under O-52 or O-54? I was just --

DR. TAULBEE: I believe from a fission product standpoint we are planning to use all of the reactors under OTIB-54. That's what my

recollection is right now.

MEMBER BEACH: Yeah. This says NIOSH will assess cesium-137 intakes using OTIB-60. That was just on this other report for -- it might just be for Test Area --

MR. KATZ: Well, then, my question to the Work Group is, do you want sort of follow up on the ones that have been identified now first, or do you want SC&A to go hunting through all of the other reactors at this point for other possible outliers that -- what makes sense from a --

MEMBER MELIUS: I would prefer a prioritized list.

MEMBER BEACH: I was going to say --

MEMBER MELIUS: So that we're not, you know, grounded. And I think, you know, to the extent that those people -- you know, those time periods that would be covered by an SEC.

CHAIRMAN SCHOFIELD: The different fuel loadings that you have, those are basically covered by OTIB-54, whether you're using different

variations in the uranium loadings or plutonium.

DR. TAULBEE: Within OTIB-54, there are three different fuel loadings for ATR that are used, two for N-Reactor, I believe two for TRIGA. Steve had an excellent slide that goes through the OTIB-54 with the different modelings for it.

MR. STIVER: Tim, it was my understanding that you are going to be using the ATR for -- as kind of a default condition for all of your dose reconstructions at Idaho. Maybe I'm wrong on that.

DR. TAULBEE: We'll be using OTIB-54, which is the bounding of those, for the different scenarios. ATR isn't always bounding.

MR. STIVER: I guess our concern, really, is that, you know, this is really the first time we're given a situation where we have all of these experimental reactors and there are all kinds of crazy things. And so this is really what drove this review in the first place, and you'll see when we go through the Test Area North that --

DR. TAULBEE: You know, it's --

MR. STIVER: -- are different. And, you know, Steve, you know, we talked about this internally, you know, maybe asking you guys whether you would want us to put together some sort of a prioritized list of those that we think, you know, might be candidates for further review.

MEMBER MELIUS: I think the answer -- my answer would be yes.

MEMBER BEACH: I agree.

MR. STIVER: Okay.

MEMBER MELIUS: I think that makes sense. I think it makes sense in terms of where NIOSH is prioritizing its efforts at this time.

MR. STIVER: Okay. All right. Steve, well, thank you for a great presentation.

DR. OSTROW: You're welcome.

MR. STIVER: Next up is going to be the Test Area North, and this will be -- John Mauro and Hans Behling will be leading this discussion.

DR. MAURO: Can you hear me? This is

John Mauro.

MR. KATZ: Yes. John, that noise came on when you came on. I don't know if that's --

DR. MAURO: I've been on for quite some time. I'm not on mute, so that I could listen in better and -- and it just stopped, so I'm not -- I think -- are you okay now?

MR. KATZ: It's better.

DR. MAURO: It's better? Yeah. I hope that's not me. Let me start, and we'll see how we go.

I don't -- I'm not on LiveMeeting, but I do have my slides up. I presume you're on LiveMeeting, but we will make do. So right now I am looking at my very first introductory slide with the title. And, first, let me apologize to Hans and Mike Mallett for not having their names on here, because they were major contributors to the work we did in our main report, and also to the slide presentation.

With that, let's go on to Slide

Number 2, lower right-hand corner. We can follow it that way best.

MR. KATZ: It's not showing up.

MR. STIVER: It might help if I shared it. These little details.

MR. KATZ: One moment, John.

DR. MAURO: Sure.

MR. STIVER: Okay. Here we go. Is that better? Can you see that? Does everybody see that? Full screen mode I guess.

MR. KATZ: Okay. Thank you, John, for waiting.

SPEAKER: Hello?

MR. KATZ: Someone -- whoever just called in, you're on an Advisory Board on Radiation and Worker Health meeting. Is that what you --

SPEAKER: I'm sorry.

MR. KATZ: Okay.

DR. MAURO: Yes. I'll begin by first saying to Steve, thank you so much. You set the table for me perfectly, and my presentation now is

going to go into I guess the next tier down in terms of some of the issues that are related, very much related, to your presentation.

The best way to think about Test Area North is -- and what we did, we had to be selective in what we decided to probe. And we did -- you know, on this Slide Number 2 that you're looking at here, gives you a summary of all of the different types of campaigns, research activities, that took place. And it comes directly out of I believe the Site Profile, so it's very convenient.

And when we decided to -- okay, how are we going to come at TAN, we decided that what we're going to look at are fundamentally two areas of inquiry. One is the completion. How complete is the external dosimetry data for the full suite of different types of investigations that took place?

And a large portion of that work in compiling that data and digesting it was done by Amy Meldrum, who unfortunately is not on the phone, but I will cover for her.

And the other side has to do more with internal dosimetry, but internal dosimetry is from the point of view of two perspectives. One, the fact that a lot of different types of fuel was handled in hot shops, stored and handled. And we -- but there was also a degree of processing. We didn't look at that side of it.

What we did was we looked at, okay, if you're handling fuel, basically, you're using OTIB-54. And is there anything similar to what Steve pointed out about the type of fuel that was handled that was very unique, that demonstrates, that reveals that, you know what, OTIB-54 really does not always apply.

And, in this case, I have to thank Mike Mallett, who is on the phone with us -- and, Mike, are you still on the line? Hope he is.

DR. MALLETT: Yes.

DR. MAURO: Thanks, Mike. And Mike was extremely helpful, because he did make some ORIGEN runs for us to confirm what -- or if it's

not, or to demonstrate that our initial thinking about the bounding nature of OTIB-54 perhaps is not always bounding, and for -- which was a bit of a surprise to us, and we'll get into that momentarily.

And then, the third element, which also goes for internal dosimetry -- and Hans will speak to this -- is the very unusual nature of the Aircraft Nuclear Propulsion Program, not only from the point of view of the type of fuel that eventually was produced and sent off to a hot shop, and its unique characteristics and radionuclide mixes, which bears no resemblance to OTIB-54, but as important, if not more important, is the airborne releases associated with each one of these initial engine tests where they allow the fuel to burn to the point where it -- of destruction. And just about all of the fission products, except for the refractory elements, went up the stack, which creates a very unusual set of circumstances.

But these are outdoor exposures now,

and exposures that come from releases that went up a very tall stack, and also went up at a time where NIOSH -- NIOSH, I'm sorry -- where DOE was very careful to have those experiments at a time which minimized the wind direction of such a nature to minimize off-site impacts.

So think of it like this. When you're talking about external exposure and data completeness, and then we're going to talk about some of the unusual circumstances related to internal exposures.

With that, let's go to the next slide, Slide Number 3.

And Slide Number 3 basically summarizes what I just said, so we'll go on to Slide Number 4. And now we're going to first talk about external dosimetry data. Amy Meldrum, who is a health physicist and a nuclear engineer, did all of the heavy lifting here. And she went into the SRDB that was in place at the time, essentially it was as complete it could get at the time, and did

a very thorough word search, and actually came up with the bottom line is 180,000 -- 181,000 readouts for beta/gamma dosimetry, and over 6,000 neutron readouts.

So there's our data set. Okay? This enormous data set. That's our starting point. So, okay, what do we have? Is this complete? Is this adequate? Is it of such a nature that we could say, yes, we could reconstruct doses, or we can't. Where are the holes? Are there any holes? These are the kinds of questions that Amy asked.

Next slide, Slide Number 6.

What Amy did here was say, okay, let's try to -- given the magnitude, the massive number of measurements, she made this picture. The top one in orange color is the beta/gamma dosimetry data. In effect, what this says is, in the aggregate, when you look at TAN as a whole, you've got a complete beta/gamma dosimetry set, except for this slight gap you see there in -- sometime in 1961.

But for all intents and purposes, if one was to ask a big question, do we have really good and complete data for TAN as a whole. Now, we're getting -- that's going to be qualified in a minute. The answer is yes.

With regard to neutron dosimetry, we are seeing that there are a lot of gaps. Now, what we don't know, and what we have not done, is ask ourselves, well, are those gaps legitimate gaps?

Legitimate in terms of, well, there was no reason to do any neutron dosimetry at those times or -- and/or if we were to do additional data capture, would we fill in places where perhaps neutron dosimetry should have been done, but we just didn't capture the data. So this is something that is sort of on the table right now that needs to be like an action item.

What do we need to do regarding these -- the gaps we are seeing in the dosimetry -- the neutron dosimetry data. So, and that's like a hint of what is to come in order to come to grips with

this.

Let's go on now to the next slide, and this gives a little bit more breakdown. When you start to look at TAN and external dosimetry data, you say to yourself -- this is a very important question. I think this is the key takeaway from the work we've done on external dosimetry data for TAN.

The key takeaway is, yes, we've got a very complete data set for external beta/gamma. We've got somewhat of an erratic set -- data set for neutron dosimetry. But then, when you start to ask yourself the question -- well, hold the presses. We all know that TAN is not a homogeneous operation. Over time and space, the types of activities, the types of research, campaigns, et cetera, et cetera, were very, very different, what people did.

And one could ask the question, well, you know, it might be desirable -- now, this comes to this issue of co-worker model. Let's move on.

I may be jumping the gun. And this gives you a little bit more information regarding the nature of the data for different subsections, sub-activities, within the -- so this is a way of visualizing the completeness of the data for different subsets of the activities at TAN, some of which appear to be fairly complete, and some which appear to be incomplete, especially with respect to neutron dosimetry.

And, again, for reasons that we really can't say right now whether we need additional data capture or we could find out, yeah, there really was no reason to monitor. So there is an open-ended issue there.

Okay. Now, when we start to go through -- we ask ourselves a question. Okay. Here we have a person that we'd like to reconstruct his dose. And we know that he worked at a given location, one of -- at a given time period at a given location. And then we say to ourselves, "But we don't have any data for him," so this goes towards

co-worker models.

So, really, right now the subject that I'm going to talk about is, are there any challenges in terms of co-worker models? If one decides that, you know, there is a need for a co-worker model to fill in the gaps for those workers who were not monitored but perhaps should have been monitored, you run into a problem.

And the problem really boils down to this. When you go into the records, the records are not clear what particular facility the person worked at. We don't know that this particular worker was where he was. And even if we did, one of the problems we run -- within TAN now, the problem we have is, okay, can we break out from this massive external dosimetry data that we call TAN, could we say, well, which subset of that can we grab and say represents one of the sub-facilities.

For example, the LPTF, whatever that stands for -- I'd have to go look it up -- Low Power Test Facility. Taking a guess. Can we build a

co-worker model? The problem we run into is, the labeling of the records are such that, as best we can tell right now, are not complete.

So we can't sort the data set into subdivisions within TAN, at least not to our satisfaction to the point where we can say with confidence that you could build a co-worker model for people that worked at a particular facility. All we know is they worked at TAN. We have a lot of good data regarding -- we know that, you know, regarding Aircraft Nuclear Propulsion Program. But there are some subdivisions where the records are such that they are not labeled in a way that we could -- we could pull it out and create a subset and put them into a distribution and build a co-worker model.

So what I'm bringing up right now is what I consider to be an SEC issue. Namely, if it's judged that co-worker models for external dosimetry are needed in order to reconstruct the doses, external doses to all the workers, and where

we're -- and all you could say is that, well, we have lots of TAN data in general, but we know that the nature of the exposures at these different subdivisions were quite different, the distributions of exposures.

So it's very hard to say that we can build a co-worker model for some of these subdivisions. So we have really two what I consider to be potential SEC issues that have emerged from the work that Amy has done. One is the challenges associated with building co-worker models for some of these subdivisions is such co-worker models are needed, and, second, neutrons are -- there is enough reaction in neutron dosimetry data where those gaps might be important if they are real gaps; that is, people should have been monitored when they weren't.

But that problem might go away if we find that, no, there is good reason why they weren't monitored. There was no reason to monitor them. Or we find that if we do additional data records

search, we will find that there are data and we could fill in some of those gaps.

Let me page down. So, in effect, now you're looking at Slide Number 10. I essentially summarize what I would call the bottom line of our takeaway for external dosimetry data at TAN. That also goes for Slide 11. So Slides 10 and 11 give you the bottom line of our takeaway from what we've done to date.

Now, let me caution -- I don't consider these to be findings in the classic sense. I think we are in a process right now of exploratory where we are starting to identify areas of vulnerability with respect to dosage instructions that collectively we all need to look at and plan a path forward, as opposed to saying findings as we very often have done in the past.

I think I see this -- well, for better or worse, I see this as a collegial relationship at this point where what you're hearing is SC&A's takeaway from what we have done to date, so that

together we can understand where we feel there might be problems. And then, of course, the Work Group can make judgments on how best -- the path forward for dealing with some of these issues.

Let me move on to Slide Number 12 where I am changing subjects now.

MR. STIVER: John? You might want to give the Work Group a chance to ask --

DR. MAURO: Oh, absolutely. I'm sorry. Please. Any questions on that?

MR. STIVER: Any questions for the external dosimetry session?

MEMBER MELIUS: Any reaction from NIOSH?

DR. TAULBEE: Yes. Yes, I've got a couple of reactions. One is, back on your initial slide, what records was it that you were looking at from identifying different people and different areas? Because, to my understanding, we do not have a complete complement of all of the external dosimetry records from the site.

DR. MAURO: So you're saying you believe that there are a lot more records out there that still need to be captured.

DR. TAULBEE: Well, captured or requested, yes.

DR. MAURO: Or requested. Good. Good.

DR. TAULBEE: Yeah.

DR. MAURO: Well, that's the way I would -- I qualified my statement.

DR. TAULBEE: Most likely, the only electronic data sets that I know out there that you would possibly be looking at would be annual summaries. Is that correct?

DR. MAURO: I -- no, I believe we have also individual change-outs. But I can't say that for certain. I have to be a little cautious, since Amy is not on the line. And, as I said, she did the heavy lifting.

I guess the best I could say is, for the data sets that we looked at, which on Slide 5

summarizes what we did -- that is, we went into your SRDB, we searched on key terms, and captured certain records.

Now, I cannot say -- what I understand from looking at this Slide 5 is that these are readouts. You know, 181,000 readouts. So I don't -- when you say the word "record," we have pages of records. We have 37 documents, as indicated on Slide 5. But they certainly appear to be individual change-outs.

DR. TAULBEE: Okay.

DR. MAURO: Okay?

DR. TAULBEE: Well, this is where I'm beginning to wonder of -- and this is specific just for TAN.

DR. MAURO: And this is specific for TAN. Absolutely.

DR. TAULBEE: Okay. And did you all code all of that data?

DR. MAURO: Yes. They have been sorted. And if you go to our report, you'll see

an amazing set of bar graphs sorting everything by time and location and number of records, by time and location, in three-dimensional bar charts that Amy put together. So you can actually see where are the holes or the deficiencies, like -- when I say "location," I mean activity, you know, campaigns, experiments, by time and location.

So I think Amy has put together what I would consider to be a very nice blueprint of -- and visuals that gives you quickly an impression of where we may want to probe further with respect to additional data capture.

DR. TAULBEE: Okay. Well, I need to look at this a little more closer, because I'm not aware of any electronic data set in order to do this. And if Amy has coded this, I am certainly interested in looking at it. Absolutely.

DR. MAURO: I don't -- I have to say that I don't think it was electronic. I think she brute forced it.

MR. STIVER: Tim, referring to

Table 14 in the actual report, it lists the SRDB reference IDs. The area has mentioned the number of pages, the number of badge exchanges for those by beta/gamma. I'm trying to see whether she mentioned the type -- Table 14 in the actual report.

MEMBER BEACH: What page is that on?

MR. STIVER: Page 53 of 76.

DR. TAULBEE: Okay. Well, I would have to correlate with the site those SRDB numbers to verify that that is in fact all of the Test Area North dosimetry.

DR. MAURO: There is a table in the report that I don't have open in front of me.

DR. TAULBEE: We're looking at that right now, John.

DR. MAURO: Okay.

DR. TAULBEE: Because it looks like the bulk of this is the GE Aircraft Nuclear Propulsion. And some of these other areas, John, that you have identified as potential concern, I'm not sure that everything in the SRDB is inclusive of all of the

Test Area North data.

To my knowledge -- and, Brian, please correct me if I'm wrong, but we have never formally requested from the site all of a specific area's dosimetry, except for CPP, with regards to this evaluation. Is that correct? Brian Gleckler?

MR. GLECKLER: I couldn't hear that last -- you're still pretty hard to hear, Tim.

DR. TAULBEE: Sorry. Have we ever made a request of the site for all of Test Area North external dosimetry?

MR. GLECKLER: No. But I -- the one thing I do specifically recall is on some of the static capture trips reviewing boxes of Test Area North dosimetry records. And I did not capture anything from those boxes, because that was not a focus at the time. However, I did scan through them and -- because I was curious about neutron doses, and the one thing I do recall is that the vast majority of neutron doses were zero.

DR. TAULBEE: Right. Okay. And this

is what I'm trying to communicate to John and to others is that that just -- the SRDB is not necessarily inclusive of all the records that are out there, because we never made a concerted effort to actually capture them all.

DR. MAURO: We appreciate that. We understand that. And that's why I made it -- I try to, you know, make it clear that I think we are in a data capture mode, to find out really, you know, are we missing information that could help us deal with the issues that I just raised.

So, and I think that -- as I mentioned, when Amy gets back, I think it would be a great idea for her to be available to the Work Group to discuss in a little better -- a little more granularity, you know, what she saw. Clearly, she could only work with the data that was already captured and in the SRDB, and clearly it's my understanding now from listening to you that there is still a long way to go on data capture.

DR. TAULBEE: That would be my

understanding.

DR. MAURO: Okay.

DR. TAULBEE: Like I said, we -- the only site -- the only area that we made a concerted effort to try and get all of the dosimetry with CPP, and that was just between 1963 and 1974. We did not even try to get CPP data prior to 1963.

So, in the case of the temporary badges, they actually came as part of a box, so, you know, obviously we got that data. But that is the only area at INL where we have made a concerted effort to obtain all of the dosimetry.

DR. MAURO: But, please, let me point out, out of the 181,000 readouts, there were, you know, a lot of data, an awful lot we could not place that readout for a particular subdivision within TAN, which creates the potential for challenges in building co-worker models for subdivisions. As such, co-worker models are deemed necessary.

DR. TAULBEE: Which brings me to the second point that I was going to let the Board know

about, is that, at this time, we do not plan on developing an external co-worker model for INL. Our understanding from the procedures and our review that we have done to date is that all workers entering radiological areas were monitored.

We certainly have demonstrated that for CPP. Test Area North is another example. You can find people who will indicate that they worked at, say, LOFT, for example. And when you look at their dosimetry, or you look at their record and you look at their employment time periods, it is before LOFT started up.

So there is going to be a lot of new construction where people will indicate that they worked at Test Area North, and they did, but they were not monitored because there was no need to be monitored, which brings me to the other point that you brought up there, John, is that with these gaps that you have currently identified, I would encourage you to look at whether there was a need for monitoring at that facility at that time.

DR. MAURO: I agree with you. I'm -- that's why I qualified what I had to say, you know, regarding, you know, are these real gaps or not? But you bring up a very important point, and we've run across this before. When a judgment was made that there is no need for co-worker models -- as we all know, sometimes there are surprises, where a judgment is made as to, well, there are people that worked there that were not monitored. What do we do about them?

You know, it's not unlike the SEC issues we just talked about. We know, you know, everyone that worked at CPP we had dosimetry data, and, therefore, have defined your Class. And that's the struggle that we went through just now. And can we say that with confidence? In effect, you're saying the same thing. You're saying, in effect, that for all of the subdivisions, we have -- there are no gaps.

In other words, everyone that should have been monitored was monitored. And I think

that needs to be seen. I mean, that may be true, but I think it's important that we keep our eye on that.

DR. TAULBEE: I would agree with that.

MR. STIVER: So, I would say, going forward that would be something that the Work Group would want us to take a look at, because there are these areas with gaps, neutron dosimetry, and try to correlate them, if possible, with activities that were going on at a particular time. Or is that something more of a NIOSH prerequisite?

DR. TAULBEE: Before that is done, I would say if the Work Group wants to do this type of analysis, then we need to make the request to the site for all of the dosimetry, so that you can actually look to see if there is a real gap, because that has not been done. What you've done is -- what you've reviewed is what we have captured through other data captures or, you know, through other activities. So we've got snapshots.

Many of our data captures -- and this

is important for the Work Group, I think, to understand. Many of the records that are in the SRDB were example records. When we captured surveys or air samples or things along that line in the evaluation of the SEC, we took examples. We didn't capture an entire box due to timeliness. I mean, it takes time to: a) capture it, b) for the classification folks to review every page of it, and then for us to get it and make a judgment on.

So, in a case like this, there are a lot more records out there. So if you want this type of an evaluation, I would first make a request of the site for those records.

MEMBER BEACH: So don't we normally do a data adequacy and completeness as part of our normal protocol when we are reviewing sites? And wouldn't it fall into something like that?

MR. STIVER: Typically, when we have what we feel is the full data set that NIOSH has been able to locate, then we could do an adequacy and completeness test. But it looks like in this

case we just have a sampling of what's really out there.

MEMBER BEACH: Right. But --

MR. STIVER: But Brian said there were boxes and boxes.

MR. KATZ: There's no electronic data set for --

MEMBER BEACH: I understand that. But as a Work Group, don't we normally want to know that the data is adequate and complete, and that's part of the exercise we normally go through. It's huge in this case.

MEMBER MELIUS: Yeah. But let me just say, I mean, I think there's other issues with the Test Area North. And I think it's a little premature to be -- I'd say it's not a priority issue. I mean, let's get to it down the road if we need to. But I think it's -- I think there are some other issues. If this is going to be a huge request to the site, that will set back everything else that we're trying to do. I mean, it's the

nature of the site.

MR. STIVER: I was thinking that the Work Group, at the next teleconference meeting, we could have Amy, you know, kind of lay out what she has actually found, and just kind of get a more detailed view of it. But I would tend to agree there is bigger SEC issues out there that would probably be --

MEMBER BEACH: Well, and I thought we kind of charged SC&A to give us a snapshot of what the potential issues were and to prioritize those. Maybe we didn't ask for a prioritization, but -- for each of these sites or areas.

MEMBER MELIUS: I think it's hard for --

MEMBER BEACH: It is.

MEMBER MELIUS: It's a big site and there's limited information so far.

MEMBER BEACH: Sure.

MEMBER MELIUS: And we're working on it. I mean, I actually thought Amy's description

in the report was fairly detailed, and I understood what she was doing from that more than the slides, which you would expect.

MEMBER BEACH: Right.

CHAIRMAN SCHOFIELD: John, could I get one clarification on a point there? Did I understand in those data sets and records you looked at that there is no neutron exposure for the majority of these people?

DR. MAURO: No. There are gaps. I --

CHAIRMAN SCHOFIELD: There are just gaps. Okay.

DR. MAURO: We are seeing gaps, and we are unable to determine whether those gaps are appropriate, because there was no need to monitor folks for neutrons at those time periods. Or that it's just a -- perhaps there is a need for more data capture.

So I guess, you know, at such time when TAN comes to the forefront for -- I was hoping that this presentation would identify areas for a path

forward for TAN at such time when you feel that TAN should move forward.

CHAIRMAN SCHOFIELD: Okay. Thanks.

DR. MAURO: Okay?

MR. STIVER: Should we move ahead with the OTIB-54 issues?

DR. MAURO: Sure. I'm on Slide Number 12, which is the opening introduction. And, again, let me preface this a bit. Go to Slide --

MR. KATZ: It's coming. It's coming. John's working on it.

DR. MAURO: Let me know when you're ready.

MR. KATZ: Hang on just a second here.

DR. MAURO: Sure.

MR. KATZ: This should already be shared.

DR. TAULBEE: While John is bringing that up, if I could make an additional follow up to my statement about the external dosimetry. We

have never requested all of it except for CPP. The bioassay records that he's getting ready to discuss, we actually have requested, and those are in the SRDB.

There are some issues with the electronic data set that was coded, and I believe we sent over at one point to SC&A. So we are actually going back and recoding that entire data set due to some discrepancies that we found.

So I would caution you all to use caution with using the electronic data set. But all of the hard copy records, we do believe we have and we did request those from the site. So that's different than the external that I talked about a few minutes ago.

MR. STIVER: Okay. Okay. John, you can go ahead.

DR. MAURO: Okay. If you could go to Slide 13. In the lower right-hand corner, you'll see the number. And let me preface again -- now we are moving into internal dosimetry. But

internal dosimetry, from a very specific perspective -- namely, the use of OTIB-54 as being a way to reconstruct internal dosimetry when you are dealing with reactors and spent fuel but not processed -- or irradiated fuel but not fuel that has been processed like SNAP-9A or other activities where, you know, the isotopes have been separated. That is a separate area of inquiry.

And Ron is on the phone, and Ron's work and our work are very complementary. Let me explain what I mean by that. Everything you are getting here from me from now on is theoretical. That is, given the type of activity, if you were to run ORIGEN, there's four of these particular circumstances.

Would one's takeaway be OTIB-54 is bounding, or it's plausible? Or it's possible that for the very unusual circumstances regarding the types of irradiated/spent fuel, is it so unusual that either, one, it's not claimant-favorable for a variety of reasons.

We're going to get into that.

And by the way, as a foretell, it looks like there are circumstances, as best we can tell, where OTIB-54 does not appear to be claimant-favorable, and so we are going to be talking about that.

So, but everything I'm going to talk about is theoretical and based on ORIGEN runs. And I'm certainly going to ask Mike Mallett, who is on the line with us, to help me out there because we moved in a territory that is, you know, beyond my world. My world is as a health physicist, not as a nuclear engineer.

And we will also be talking about ANP from the point of view of releases to the environment and what their implications are with respect to internal dosimetry.

So, with that, let's go on to the next slide, Number 14.

The question we ask ourselves is this. Stay with me a little bit on this, and I could use

some help from the nuclear engineers in the room.

When I first looked at this problem, I said, "Listen, we have all of this fuel that was produced from various types of activities," spent fuel, irradiated fuel. And what separates it? You say to yourself, okay, I think about it very simply. I say, well, when you talk about fuel and you say you -- especially if we're talking about various enrichments of uranium-235, U-238/235, various enrichments, what I think about is simply fissions. Okay?

There is a rate at which it is fissioning, which is the power level, and how long you are letting the fission go on before you shut the reactor down. And so, as far as I am concerned, you are just counting fissions.

And we know what the fission product distribution is that you would expect for each fission. Six percent of the oil fissions I believe are strontium-90 and about the same amount for cesium-137.

And so you say to yourself, okay, when you look at OTIB-54, we know we are dealing with classic fuel which was at a -- I guess predominantly a fairly high power level, the 200 megawatts, and a fairly long time over which it was allowed to continue to burn. Okay?

So what does that tell me? That tells me that under -- well, that is sort of like your arena out of OTIB-54. Now, granted, every one of these reactors are a little bit different, but to me -- say a fission is a fission. But the -- and I know that's a very simplistic way to look at the world. But I almost envision it as, well, I am producing these many atoms per second, and they are going away at this rate.

So, therefore, over some time period, I can figure out how many atoms I have of every one of these radionuclides. And then, after I shut down, they start to decay away. Granted, it's a lot more complex than that, and I guess -- and that was explained to me by my nuclear engineering

friends that you're oversimplifying. But it is what it is.

That's how I came at the problem, because I think those are second order phenomena. The first order phenomenon is -- and here is really the gist of what I tried to do, I said when you look at OTIB-54, you're looking at fair high burnup rates for relatively long periods of time for different types of reactors.

When you go to TAN, what you're looking at is very short time periods over which they allow the fission to occur. Okay. So I think about it simplistically and I say, "Well, what does that mean?" Well, that means that you are not going to be building up a lot of cesium-137 and strontium-90. Okay? Because it takes a while to build up an inventory.

So if you're -- you know, so your fission rate and the duration at which you allow fission to continue will have a profound effect on the relative amount of cesium-137 and strontium-90

you have as compared to other fission products, and also activation products.

Now, another factor that plays in on this simplistic vision of mine regarding what we're dealing with is enrichment. If you have fuel -- and this is the fuel they handled at TAN that was over 90 percent enriched -- that means you don't have any U-238 in there. Right? There is very little there. It is all U-235.

And what does that mean? Well, that means you are not going to be breeding/creating plutonium-239. So all of a sudden the world that we live in in OTIB-54 doesn't exist anymore. So that's at play. It's so different that, wait a minute, all of the look-up tables, Tables 5-22 and 23, you know, you just have to say, well, do they really apply here?

And the reaction is, well, how could they? You know, you're not allowing the in-growth of the cesium and the strontium. In addition, you don't have a -- you have very little U-238, so that

you produce plutonium. So, all of a sudden, it's a different world. And that was my -- what I say, my global perspective.

But I say to myself hold on, that being the case, using OTIB-54 has got to be claimant-favorable, because these -- for the following reasons. If you are not building up long-lived fission products, and all you've got -- and allowing them to turn their relative abundance to other fission products, well, that has got to be claimant favorable, because as a general rule, the longer lived the radionuclide is, the higher its internal dose conversion factor.

You know, if you inhale a short-lived radionuclide as compared to a long-lived radionuclide, the long-lived radionuclide is going to be fundamentally higher internal dose conversion factor. Again, a simplistic concept.

So my first impression was, well, maybe it's okay that they are using OTIB-54 for these other burnup circumstances that we're encountering

in TAN.

All right. In comes -- I'm doing more talking than looking at my slides, because I want to give you a picture of how I thought about the problem. And the next Slide 13 or 14, 15, basically summarizes what I just said. So we are moving pretty quickly.

And then what I did was I said, you know, this is me just thinking about the problem. Is it true? And that's wherein I called Mike. He's on the phone. Let's run some cases, some ORIGEN cases, where we basically validate what I consider to be my simplistic model of reality. And is it true that, in general, when you use OTIB-54, you are going to be claimant-favorable as applied to the circumstances of TAN.

And to get to that point, I'd like to turn it over a little -- there are a number of tables that are in our report that I can see they are not here in our -- well, I didn't reproduce these big, complex tables, but Mike found out some interesting

outcomes related to burnup.

And think of it like this. We run ORIGEN. We say, well, we -- on a normalized basis, we say, okay, we're going to run ORIGEN. We're going to have fissioning occurring at some power level for some time period. So assuming -- the two variables are power level and duration, and the belief being that, you know, that you should be claimant-favorable using OTIB-54.

Well, when Mike made the runs -- and here is where I am going to hand it off to Mike. We found -- what we did is -- so what we got is the relative number of each fission product, and I took each of those outcomes, I allowed them to decay for 10 days, because that's -- if you look at OTIB-54, you see that the first case I believe is a 10-day cooldown, and then they have longer time periods, but let's just go with the 10 -- I believe it was 10 days.

And then I -- now we have the relative amounts of each fission products for these

different ORIGEN runs. And I multiplied the quantity in curies, the relative quantity, the relative amount in curies of each of these long list of radionuclides by their internal dose conversion factor, because -- to say, okay, in theory, that is a measure, an index of harm.

And if under all circumstances, OTIB-54, in its relatives abundance, times its internal dose conversion, inhalation dose conversion factor, is greater than the cases that we ran -- and Mike will explain in a minute -- well, that means OTIB-54 is fine.

But, lo and behold, we found out that that's not always the case. There were sets of circumstances of burnup and duration times of burnup where this index of harm that we came up with -- and this is all laid out in the report -- was greater than one for these unusual -- for these other burnup circumstances that are sort of surrogates for burnup at TAN.

And, Mike, I hope I set the table

correctly for my, you know, simplistic view of the world. Can you help out a little bit and perhaps describe in a little more detail what you did and what the outcome was and why you think that happened?

MR. MALLETT: I think you set it up great, and couple that with Steve's presentation earlier about the different reactor model. It's simply a question of, is what's in the TBD a good representation or not for potentially bounding? That seems to be the heart of the matter here for addressing claimant-favorability for this.

And what we saw with the reactors that are in Steve's presentation, and John mentioned they are highly enriched, what we're able to do, again, in ORIGEN, simple calculations just for a sanity check is to look at low-enriched reactors that are run for comparable times to that which is factual for TAN as compared to some of the assumptions that were made in OTIB.

And I don't want to steal where you're

headed here John, but Slide 17 really gets to the summary.

DR. MAURO: Well, good. Let's go there. Go ahead.

MR. MALLETT: In what you've written here in that second bullet, or first sub-bullet, actinide intake, generally do well as you described with the blackout, the uranium-238 and Pu-239 growth.

But, on the other hand, we're a little unsure about the fission products, but we -- as being bounded by these conditions in the scenario there. It was used in the document.

We do see, in general, that the in-growth of those fission products is fairly stable, meaning you burn it for some period of time, you've got some ratio between cesium and strontium and the other nuclides. Say they're an order of magnitude difference, continue to run it for another amount of time, they continue to be relatively stable, relative to each other, say,

another -- still an order of magnitude apart in activity.

So it seems like a well-behaved reactor. It's an easy scenario to replicate in the calculations, and these are just the limitations perhaps in the Technical Basis to consider.

DR. MAURO: I think, again, the takeaway -- and this is, again, as I would say in more of a collegial dialogue, and it's all laid out in our report with our assumptions and our calculations, without getting into great detail. But we are finding circumstances where OTIB-54 may not be claimant -- two things, may not be claimant-favorable for all of the various circumstances we encounter at TAN.

And in addition, there are places where OTIB-54 is implausibly overly conservative and where it's -- it places too high a dose to the point where one could say it's just not plausible. So these are -- you know, you say again, what do you -- how do you boil this whole thing down? It comes

down to that. And I'd like very much to open the dialogue and our continuing discussion of these matters with the Work Group and with NIOSH.

For those two questions, do we have it right that there certainly appear to be circumstances where OTIB-54 might not be very claimant -- may not be claimant-favorable. And, two, are there circumstances where OTIB-54 is disproportionately too conservative related to actinide production.

When you only have a relatively short time period over which you are burning your fuel, you know, you don't really have -- and it's all enriched -- highly enriched uranium, you know, where is the plutonium?

You know, and to assume there is plutonium there contributed potentially significantly to internal dose, when it's not there, is a problem. And I think that that -- again, to make life simple, those are the two things that I'd like to have an opportunity to pursue

further with you, to talk about and to -- you know, as a next step in this process.

And I don't know, Mike, if you have anything else you'd like to add, but I think that tells our story.

MR. MALLETT: No, that's great. I think you summed it up great.

MR. STIVER: John, one other point that -- tried to make on Slide 17, which is going to get more into what Ron Buchanan is going to discuss a little bit later. When he actually looked at nasal swabs, smears, and air monitoring samples, he found -- he came to some conclusions that were a little bit different than what you guys determined from strictly modeling exercises.

That's on Slide 17, but I just wanted to put it out there just to show that there is kind of a lead-in for that next discussion that Ron will talk about.

But certainly, you know, Tim, if you have any comments about, you know, what John and

Mike have done so far.

DR. TAULBEE: My only comment, really, at this time is to remind the Work Group that there is an open issue with regards to the Initial Engine Tests at INL and those releases and the applicability of OTIB-54 and whether we should be assigning an additional factor or correction to that.

So, you know, this is something that is an open issue that we are looking at under the TBD. If you want to roll it into the SEC, we can do that, along those lines. But this is something that we started addressing a few years ago. I know Brian Gleckler has been working on a report looking at the Initial Engine Test 10 in particular. So that is -- really, that is my only comment here from that standpoint with regards to the use of OTIB-54.

Now, for the other reactors that are up there, I believe our opinion is is that OTIB-54 is the bounding scenario like we did with the MTR, TRA, and ATR reactors. But the Initial Engine Tests

were different than the others, and I am actually not sure where we stand on LOFT. I'd have to get back to you on that one.

MR. STIVER: I guess, if there's no other questions, that kind of segues into what Hans wrote up about the airborne emissions at ANP. We'll let him talk about that next.

DR. MAURO: Yes. For those on the phone, that starts on page 18 of our slide presentation. And, at this point, I'd like to pass the baton off to Hans to talk about this very special program.

DR. BEHLING: John, this is Hans. Let me go back quickly to page -- or Slide 16, because I think that's really a summary that we are discussing in more detail in subsequent slides. And if you could go back to Slide 16, the observation conclusions regarding the ANP and why OTIB-54 is really inappropriate. And it just highlights the most basic reasons why it should not be used for the internal dose reconstruction

involving if you worked at -- were associated with the ANP program

As it starts up front, the first bullet identifies an enrichment, which you have already mentioned, John, of 93.4 percent. And that really means that the bulk of the uranium is not only highly enriched uranium-235, but the most prevalent form of uranium is U-234 by far.

The other issue is that the type of reactor design that identifies, and we'll go briefly into that involves the Aircraft Nuclear Propulsion System. When we talk about -- talk about more of this, conventional reactors will be fewer. That it is either lowly enriched or moderately enriched, but it's also fuel that has cladding. It sits in a water-cooled environment that allows or restricts the temperature of the fuel up to a certain level.

There is the reactor vessel. There is, obviously, a containment building, so there is multiple barriers that would potentially obviously

mitigate the release of fission products or activation products. And then, you usually operate within a spectrum of parameters that do not lead to fuel failure.

None of these issues, obviously, apply to the ANP program, as we will discuss in a few minutes. Not to mention the fact that the fuel is also subject to extremely high temperatures. They were testing for some of the fuel tests that involved the Initial Engine Test temperatures exceeding 3,300 degrees Fahrenheit. They have to have special matrices developed that were capable of resisting such high temperatures.

And also, the fuel design -- we will talk about in a few minutes -- about the ribbon of enriched uranium. We're talking about uncladded ribbons of highly enriched uranium, and they range in thicknesses, weight and thickness from as little as one-hundredth of one inch, and they were subject to an air flow from the jet engine that propelled the air compressed into the reactor, and then

heated up to approximately about 1,250 degrees.

And so what you have, obviously, here is a fuel that has been depleted of fission products by simple diffusion and also by recoil, and you also have, obviously, an absence of transuranic materials because of the depletion of uranium-238, as John already mentioned.

So when we talk about exposures to people who were obviously dealing with spent fuel, and it's clear that the fuel from the ANP program was very, very thoroughly investigated because this was really a research project. We needed to understand how we can operate and aircraft reactor that was so unique and so different from any other reactor that has ever been tested.

Think about the logistical problems that we face or that people faced during that timeframe. This program was run by General Electric in the '50s and was terminated in '61. But one of the things you have to obviously come to conclude is that to build a reactor that would

propel an aircraft you would obviously have to deal extremely -- with different designs based on your weight requirements that would allow such a reactor to be onboard of an aircraft, and then propel it.

And so, given all of these things as an upfront statement, the idea of using OTIB-54 for a host of parameters and issues that we just basically discussed here, cannot be used.

And so, with that starting conversation, I will go to the first slide, which is Slide 19. And that is just to briefly bring up to date for people who are not familiar. I know I was not familiar with this program until 2002 when we were asked to do this, and I'll talk about that briefly later on.

But the whole concept of an Aircraft Nuclear Propulsion Program was thought about in the middle to later years of 1940s. And the reason being is that these days -- or those time periods precede our ability to really detect much in the way of oncoming missiles, which were already now

available to the Russians, that might come over the Arctic Circle.

Today, we have satellites, and most recently we obviously heard on the news the blimp that was released, unfortunately, from Maryland, and then ended up being crashed in Pennsylvania. Had that information or that data and that kind of ability to monitor incoming missiles existed, we wouldn't have probably ever developed an Aircraft Nuclear Propulsion System.

But the whole point of this program was to allow an airplane to actually maintain altitude without refueling, and not rely on fossil fuel, which would obviously limit the ability of the aircraft to stay afloat, and circle the Arctic area for incoming missiles and to conduct surveillance. And that was the whole purpose of this particular program.

As I said the program was started, the active testing program started in 1952, and was terminated under President JFK in 1961 when it was

thought that this was not a feasible program and there were alternatives. And, of course, the future was obviously there to do the surveillance by other means, including satellite surveillance.

So then we go and talk about what the program contained or represented, and I'm on Slide 20. To test the ability to use nuclear power on an airplane, they used or they developed a total of three different heat transfer reactor experiments, which really defined the core of the reactor that represent the ANP program.

These were -- and if you could have it changed to the handout that we have -- or the report that we received in September, you will see some information as far as descriptive information as well as schematic figures of how this particular design worked. It's an air-cooled system with a turbojet engine compressed engine gas high -- and then passed through the reactor core, as I mentioned was a fuel core that consisted of very thin ribbons that would allow a quick transfer of

the heat that was built up in the fuel through the air.

In many instances, some of the tests were run at fuel temperatures up to 32 degrees Fahrenheit, which in turn would heat the air that was passed beyond the ribbons to temperatures of about 1,200 degrees Fahrenheit.

And that compressed air or heated air would then come up through turbines and then to a rejecter nozzle, which then could control, and that would provide this peak operation. The amount of air that was passed through now was about 100 pounds of air per second, and that was the source for the acceleration and propelling of the reactor.

As I mentioned, there were three different designs that we used, and these different fuel designs are what are called Heater or Initial -- for the Initial Engine Test involved a total of 26 -- there were 26 different tests that were done among the three different fuel cores, Heater 1, 2, and 3.

Not all have -- or necessarily resulted in any potential environmental releases, IETs 1, 2, 3, 5 -- 1, 2, 5, 7, and 9 did not require nuclear power, and, therefore, had no potential for environmental releases of radioactivity.

So, in essence, there were 21 IETs that we were going to look at with regard to what releases might have occurred as a result of those tests that might impact not only the people in the environment of INL but potentially workers.

The potential interest in studying these releases started in 1988 and involved members of the INL Historical Dose Evaluation Task Group people. And in 1991 this particular group of individuals issued a two-volume report that was interested in assessing the cumulative curie releases on behalf of 51 different radionuclides. And in our report that we issued, you can look at the 51 radionuclides, and of course one of the key issues that I want to point out to you is that among the 51 radionuclides there was no concern about

uranium or transuranics.

I shouldn't say -- not uranium, but there are different entries of uranium-234, 235, and 238. And if you look at the actual assessments of the radionuclide quantities, and they have those three isotopes, you will see that the largest release fraction obviously does involve U-234, followed by 235, and, lastly, by 238.

And if you look at the ratio between the radioactivity associated with U-234 versus U-238, you realize that the activity of U-234 is approximately 3,400 -- 33- to 3,400 times that of U-238, and that gives you an understanding of just how depleted U-238 was in terms of the actual fuel.

So when we look at the exposures that would have potentially been experienced in the examination of the fuel, you realize that, again, OTIB-54 would not apply, and that policy -- the absence of plutonium and other transuranics, but also the relationship between the very fission products that are so critical in OTIB-54 in trying

to understand how to convert the gross beta/gamma ratio into actual numbers involving fission products.

As I said, when you have a thin ribbon of fuel that is highly enriched and is subject to tremendous stress, and in some cases intentional fuel failure, you will realize -- you will come to the conclusion that the fission product ratios, as well as the ratios of fission products to transuranics, will obviously be completely destroyed with regard to OTIB-54 and its potential use in assessing bioassays into actual doses based on OTIB-54 assumptions.

To go back to the particular historical Dose Evaluation Report that was released in that two-volume report in 1991, it was determined when we were asked to look at this that the radionuclides that were released on behalf of only three -- IET Number 3, 4, and 10 -- was approximately the equivalent of 90 percent of the total release for all 21.

And so when, in essence, we were asked to look at this under contract to the CDC in 2002, I was able to limit my focus to IET Number 3, 4, and 10. And that is basically summarized in the report that was issued back in September here of this year. And, in that summary report, I identified the various radionuclides that we had looked at, and also the -- all of the reports that were part of the initial HDTE Task Group reports.

And what we found was, in our review of this particular assessment, was that there were some serious errors associated with the original task group reports, where in the case of -- in the case of IET 10, for instance, my review and assessment of all of the data that were available, I concluded that the releases from the IET 10 effort was approximately -- between seven- and eight-fold higher than the ones that were identified by the HD group.

And for that reason, when -- if we were to actually make use of that data, we should not

go to the original report, but realize that those numbers have been amended, and I think our report, which is about a 220-some-odd page report, that is available on the CDC website, it should be looked at.

Now, that initial report that was issued by the HDTE was not intended to assess worker exposures. It was really intended to assess offsite exposures to members of the public. However, from the release quantities, those numbers could be converted to onsite doses. And I don't think that would be a major effort.

And when you realize that a total of somewhere around four million curies of radioactivity were released with that, it would have released a fair amount of -- or would have resulted in a fair amount of exposures to onsite personnel. And in looking at some of the original data that we had access to, there was very little information.

The HDTE report really is a model. It

is not based on a lot of empirical data. It is obviously an assessment of the fuel that was used and some of the analysis that was done after the fuel was taken in for a study, an investigation, but it is not really relying on any air sampling data or not much.

Early on, there was an extremely minimal number of air samplings done, and that was mostly spot samples, very periodic spot samples. So the information that exists should not be considered based on empirical data more than model data. And, as I said, in our reports, the revised estimates may be used as a release quantity of 51 different radionuclides from a stack, and it could possibly be modeled for internal exposures. But a lot of assumptions need to be made to do that.

And, in conclusion, I would only say that use of OTIB-54, for the various reasons that I identified, could not be used. It would not represent anything that has any high degree of credibility in terms of its applicability with

regard to a conventional reactor, and these ANP reactors would clearly not be the conventional reactor that we normally think about, and, therefore, the issue of internal exposure, especially for those people who may have been exposed to these releases -- and all of these release quantities that you see in those reports were direct releases to the atmosphere.

There was no retention, there were no barriers, there was no filtration, nothing. All of the curie quantities that are cited in the report, at least for IET 3, 4, and 10, were actual curie quantities that -- or at least model curie quantities that were released directly to the atmosphere.

I guess, with that, I will close and ask if there is any questions.

MR. GLECKLER: This is Brian Gleckler. I'd just like to add one more thing. At the March 25, 2014, Work Group meeting, we presented a White Paper, and one of its conclusions was in regards

to those three IET releases, 3, 4, and 10. And 3 and 4 we determined -- or presented the argument that the trajectory of those releases went offsite and did not affect the onsite workforce.

So that stuff is kind of moot, and we are still investigating IET 10. That's the open issue.

DR. BEHLING: Yes. As John had mentioned earlier on, the actual tests that were done in the different IETs were carefully monitored for the potential exposure and minimizing exposure for onsite personnel. And so I have not looked at this.

When SC&A was asked to conduct this study and could it review previous estimates by the HD task group, our effort was really to look at the potential exposures to offsite personnel. So I'm not going to deceive anybody that our effort was really to look at whether or not the original curie estimates on behalf of each of the IETs -- 3, 4, and 10 -- were reasonable based on available

information.

And then our findings were carefully assessed, and we presented our findings to the HDTE task group, the original people -- Peterson, Wenzel, and others -- who agreed with our assessment, and they realized they had overlooked some very, very important issues that would have raised their estimates by, in some cases, several fold.

So we are not going to say that the data that we have presented has any intended use for worker exposures, but it's just as a way of potentially looking at the data. You could convert some of the offsite releases and convert this to onsite releases based on curie quantities and, again, go back maybe to some of the original data and look at what the radiological factors were that would have precluded significant exposures in some cases, or would have potentially resulted in onsite exposures to personnel.

DR. MAURO: This is John. I'd like to

add one more point. I was always a bit concerned about particulate fallout. We'll go back to the old classic hot particle issue.

Granted, you have an elevated release designed specifically to have -- to occur at times to minimize offsite impacts because the wind direction was in the proper direction. And one could argue if the release is elevated enough, and the meteorology is appropriate, there is little potential for these airborne plumes to touch down onsite, with the exception of particulate material that could fall out, you know, gravitationally.

So I guess I would just say, again, from a collegial point of view, it wouldn't be a bad idea to say if whether or not that's a scenario that needs to be explored. And that would be probably more along the lines of external, but maybe internal. I'm not sure.

MR. KATZ: Tim, do you want to respond?

DR. TAULBEE: The only comment that I would say is back before John's comment about hot

particles, but the -- you know, we recognize that the Initial Engine Test Number 10 is of concern, and we are developing a White Paper to address that, to go into the TBD for an additional dose reconstruction method. This is under the TBD review process.

Again, you know, from our particular standpoint, we recognize everything that has just been said here. And we have discussed that under the Work Group -- or with this Work Group in previous discussions. And as Brian pointed out, 3 and 4 going offsite, were closed out by the Work Group here. If you want to reopen them, you are certainly welcome to; it's your all's prerogative. But Initial Engine Test is still outstanding from the TBD standpoint, and we recognize that.

MEMBER BEACH: That's true. We did close those off earlier.

MR. STIVER: In any case, it does look like it's more of a Site Profile issue as opposed to something that --

DR. TAULBEE: Again, that's our opinion right now, but if you all want to make it a part of an SEC issue, we can -- I'm sure there is probably --

MR. STIVER: Our concern is really the -- you know, the source term that we were able to develop, you know, there is some modeling to be done for onsite environmental exposures. I would recommend using that opposed to earlier data.

MR. KATZ: Phil, do we want a lunch break at some point? Phil, do we want a lunch break at some point?

MEMBER ROESSLER: Say yes.

(Laughter.)

CHAIRMAN SCHOFIELD: You want to eat? Okay. Why don't we take a break.

MEMBER BEACH: Do we have an action out of this, then, or --

MR. KATZ: Well, no. I mean, I just want to --

MEMBER BEACH: Okay. I didn't want to

go too --

(Simultaneous speaking.)

MR. KATZ: So, yeah, let's figure out whether there is an action. It doesn't sound like there is an SC&A action under this.

MEMBER BEACH: Well, NIOSH is still reviewing 10, which would leave that open for SC&A. So what about 3 and 4? We did close those earlier. Do you want to go back and look at that White Paper and then maybe refine that or --

MR. STIVER: I don't think that we really need to do that at this point. I mean, if the Work Group has closed it out, that -- you know, the idea was that the material went offsite as opposed to onsite. Again, I don't think it's really an SEC issue. It's something that needs to probably be looked at some point in a TBD.

MR. KATZ: Well, if it went offsite, it's not a TBD.

MR. STIVER: Well, as far as a TBD issue.

(Simultaneous speaking)

MEMBER BEACH: Okay.

MR. KATZ: Okay. So does that --

MR. STIVER: And the other issue was about the neutron dosimetry, but that's, again -- you know, that's not something that --

MEMBER BEACH: Well, at some point we're going to have to start tracking these, so we can keep -- I know we always have a matrix. We don't -- we're not to that point yet, but --

MR. STIVER: It might not be a bad idea to start doing that now.

MEMBER BEACH: We need something to start keeping kind of --

MR. STIVER: So we can keep track of all of these --

DR. TAULBEE: I was going to recommend that. I'm taking some notes here, and I was --

MR. KATZ: And SC&A can set that up.

MR. STIVER: Yeah. We can set it up. We can compare our --

MR. KATZ: The last meeting and where we've come so far up until this point.

MR. STIVER: Send it to NIOSH for input from --

MR. KATZ: Yeah.

MEMBER BEACH: Yeah.

MR. KATZ: Okay. So that's a work item.

MEMBER BEACH: Okay.

MR. KATZ: I guess we can take a look at the bioassay indicators after lunch. That should give us enough time.

Okay. So that's where we'll come to after the break. And do we need an hour? Probably. They are pretty slow at this -- if you're going to get -- so 12:30. It's 12:30. It's almost 12:40. So about 1:40 we will start back up again, for everyone on the line.

Thanks. And I'll close the line and we'll restart then.

(Whereupon, the above-entitled matter

went off the record at 12:38 p.m. and resumed at 1:36 p.m.)

MR. KATZ: So, good afternoon. This is the Advisory Board on Radiation and Worker Health INL Work Group. We are just regrouping after lunch.

And we're ready to go in here. So, do you need to check with anyone's attendance right now, John?

MR. STIVER: Maybe Ron Buchanan.

MR. KATZ: Ron Buchanan, are you on the line yet?

DR. BUCHANAN: Yes, I'm here.

MR. KATZ: Okay. I mean, Bob Barton's going next.

DR. BUCHANAN: Yes, I see that.

MR. KATZ: Okay. And, you folks, Tim, you don't need anybody on the line, right?

DR. TAULBEE: No, Brian Gleckler will probably dial back in but that's it.

MR. KATZ: You're okay?

DR. TAULBEE: Yes.

MR. KATZ: Okay.

DR. TAULBEE: We're okay.

MR. KATZ: So, Bob?

MR. BARTON: All right.

MR. KATZ: It's all right, Phil?

MR. SCHOFIELD: Yes.

MR. KATZ: Can Bob go?

MR. SCHOFIELD: We're ready.

MR. KATZ: Okay, then.

MR. BARTON: All right, I just wanted to talk a little bit about OTIB-54. I'm just kidding.

(Laughter.)

No, a lot of interesting discussion on that, but for this, we're actually going to take a little bit of a step back and instead, talking about how we use these gross beta-gamma to ratio for other fission products or activation products and that sort of thing.

This is where we just took a look,

pretty much took a step back, looked at the entire site from a claimant perspective and those gross beta-gamma bioassays and how they will fit in with actual dose reconstruction implementation.

But I just want to give a little background first. Obviously, the first item we see here is the release of the SEC Evaluation Report.

Back in July, just prior to the last INL Work Group, SC&A released a status report memo that was entitled Interim Summary Report on the Evaluation of NIOSH's Idaho National Laboratory SEC-00219 Petition Evaluation Report. And that report was also discussed during that INL Work Group.

Basically, as it related to internal dose based on bioassay, SC&A had identified four essentially main assumptions with the ER in establishing that internal dose reconstruction was feasible.

The very first item, which was entitled

Item A in that report, and I'm going to just read this into the record.

FAP bioassays. Sufficient workers' records contain fission and activation product bioassay in vitro and in vivo results are available to assign intakes and resulting doses from FAP some periods/areas may need a FAP coworker model developed.

And Item A is the subject of this presentation.

So, here's a table that's kind of derived from a couple of different tables from the SEC Evaluation Report. And, essentially, what it shows are the main areas at INL and the determination in the ER report as to the feasibility of dose reconstruction.

So, if we start sort of in the upper left, we see a lot of Ns in those early years. That's because there really was no radiological work going on during that time with the exception of Central Facilities which was right away 1949.

And, as we can see, besides those first handful of years, NIOSH determined that dose reconstruction is feasible in each area, essentially up until 1967.

And, from 1967 to 1970, it was determined that coworker models are going to be required and the only exception there is the burial ground for which 1969 and 1970 were held in reserve.

And that's essentially what this slide says. But my take-away from that is for periods prior to 1967, essentially this current status is that internal dose reconstruction is feasible, even without the need for any sort of coworker model.

So, this is how the SC&A approached its review. We went with a semi-random sample of INL claimants and I'll get to what that semi-random means in a second.

Just to assess the adequacy and completeness of the individual records within each claimant file for the purposes of dose

reconstruction. And, essentially, it leads to three main questions and these are the questions that always seem to arise when coworker models are discussed. Were all relevant workers monitored for fission and activation products? Were those monitored worker records complete? And the corollary for both of those are coworker models appropriate for areas and time periods other than those that have already been designated?

Continuing with the description of our approach, SC&A determined that there were 973 claimants who had covered employment at INL during the evaluated SEC period.

And I want to be clear, when we talk about the SEC period here, it's the evaluated period, not the proposed Class Definition period. So, that evaluated period is from 1949 through 1970.

Of those 973, about 921 has SEC employment greater than 90 days. So, we took that claimant population and semi-randomly selected

them. And here's what I mean. We did randomly select them but when we populated our database out of NOCTS, we essentially had an entry for each claimant employment period that we were randomly pulling these numbers from.

So, essentially, what happens is, even though it's intended to be random, because it would essentially bias it towards workers who had multiple job periods during the SEC evaluation period, those claims kind of get selected more.

So, we ended up with 92 claimants, which is roughly ten percent of that number, 921, that had greater than 90 days.

One note is that when we selected these claims, we had nine of them that we ultimately discarded mostly because the employment duration for those selected claimants was much less than 90 days or, in one of those cases, the job duty was an attorney who stated outright that they weren't badged and all the records show that they weren't monitored. So, we didn't feel that was a very

germane case to add to the study.

Here's a breakdown of the actual job titles we looked at of the 92 workers. That doesn't include the ones we discarded. And, as you can see, the trades workers occupy a huge portion of it. And, again, that's because of the bias towards workers who had multiple job periods.

It sort of was an unintended bias. We really didn't realize until we started populating the actual overall numbers for job titles, but I guess I'll try to excuse myself here and say that if you're going to bias it in one direction, that's probably the one you want to go to, towards the job types with more intermittent employment and maybe not be on a regular bioassay schedule.

But, as you can see, we also have some pretty good job coverage in other areas, health physicist, electronics technicians, operators. We have some administrative people in there. We have security guards and then the engineers and scientists.

So, as we saw in the pie chart, over 60 percent of those sampled claimants would fall into that trades worker category. But I'd also point out that when you say trades worker, that covers a lot of different professions which included, but this isn't the definitive list, obviously, but heavy equipment operator, welder, pipe fitter, plumber, asbestos insulation worker, general construction laborer, carpenter and electrician.

So, here's kind of an overview of the results, just to give you an idea of the numbers we're looking at here.

So, we have 92 total claims. You can see that's at the top row on this table.

The average number of years for those 92 claimants was about eight years in the SEC period, evaluation period. And then I gave the average and the median samples per year per worker and also the average and the median of the number of individual employment periods that were there per worker.

And, as we can see, especially with the employment periods, the average number is six employment -- distinct employment periods during the SEC but the median number is only three and that just sort of goes to show how the distribution of workers was biased towards those workers with more employment periods.

Then when you take the average and you look at each worker's, you know, grouping of employment periods, whether it be the six or the three or whatever the individual worker is, we found that just under 50 percent of those individual work periods did not have a fission and activation product bioassay associated with it.

One of the first things we observed when we got into this is that there definitely appears to be a change in monitoring frequency that occurred in 1967.

Basically, you see a claimant that was monitored several times per year via bioassay for gross beta-gamma. And then 1967 rolls around and

suddenly the monitoring frequency was stretched considerably to biannual or even longer than that.

So, that leads to our Observation 1, SC&A fully agrees with NIOSH's assertion that coworker models are necessary for that period, 1967 to 1970.

We also observed a number of unmonitored workers, not just unmonitored work periods. So, these are the workers that we just don't have any internal dosimetry for.

Now, that said, they may have had fission and activation product bioassay associated with another area such as Argonne or NRF or had bioassay taken but after the evaluated SEC period.

So, here's some examples, and I'd like to put these out there just to kind of illustrate what it looks like when you're actually looking at an individual claimant record and how this kind of fits into the big picture of the whole issue of how you reconstruct these internal doses.

So, the first one we're looking at here

is an iron worker/laborer. The CATI interview indicated that work with radioactive material was 40-plus hours a week. And there's also a couple of interesting statements here, I'll just read these.

The Energy Employee said they took turns going into the hot cells. They were given a certain time limit on how long they could stay.

The Energy Employee said some of the tools they used were taken away and could not be used again because they were contaminated.

The Energy Employee said sometimes when they would get contaminated, the monitors would try to use tape to get the contamination off.

And the reason I included those and I think they are important is because it shows that internal exposure potential likely did exist for this claimant during the SEC evaluation period.

This particular claim also had external dosimetry and the location file cards indicated MTR, AX, MTX and CX, so a lot of construction areas

for some of those years during the SEC evaluation periods.

So, again, that's another indication that there was internal exposure potential but we don't have any internal monitoring.

Another example was the mechanical engineer. Unfortunately, that particular claimant did not -- declined to be interviewed. But, again, the location file cards indicate they were a TAN MTR CFA during several of the years of the SEC employment. And the annual monitoring summary indicates external monitoring didn't begin until 1961.

We have an electrician. I'm a bit confused by that last bullet, but we'll get back to that.

We have an electrician. Again the CATI was declined. External monitoring at CPM which was just another moniker for CPP, I think it was actually referring to a process within CPP in the early years, and he had external monitoring in the

1950s, also external monitoring at OX, CPP, MTR and AX beginning in 1960.

This claimant was technically not unmonitored because they do have one bioassay result that was in 1969, but that was actually strange that they're not considered part of the covered employment.

But I will point out that any time that arises, NIOSH will always or at least as far as I've seen in dose reconstruction, you use that data to arrive at a PoC. So it's not like it's left off the board simply because it wasn't technically part of the covered employment.

So, this brings us to Observation 2. Now, I'll just read this into the record.

Based on SC&A's review of sampled claimants, it is not apparent that the lack of internal monitoring data is indicative of a lack of internal exposure potential.

Given the uncertainty in establishing work areas, activities and ultimately exposure

potential for claimants, particularly in the early years, it is recommended that coworker models be evaluated and developed for workers who were unmonitored but likely should have been monitored during all periods for which such exposures are possible.

In addition to the unmonitored worker population in our sample, there's obviously going to be some partially monitored workers.

So, we examined these workers who did have some bioassay but also had unmonitored portions of their employment.

As I showed before, on average, there are about six different employment periods per worker sampled. The median number was three. And about 50 -- on average, 50 percent of these did not have associated bioassay.

So, again, here's some illustrative examples. First, we have a custodian and there's a single internal monitoring result in 1958 but the employment for this individual extended over a year

past that sample and there was no other employment after that.

The location file card and the external dosimetry indicate assignment to CPP and SPERT during this latter year. So, statements from that CATI report, part of a job was to clean up spills and accidents. The Energy Employee mentioned working behind lead barriers and liquid waste was seeping around. The Energy Employee wore cotton overalls and a mask or respirator. The coveralls were taped at the edges. The Energy Employee had mentioned a cleanup job where they went through so many casual laborers that they even burned out the bus drivers.

And, again, this is -- it's anecdotal evidence that this person was likely internally exposed. And, based on the external dosimetry, one could argue after the last monitoring result for that individual in 1958.

Here's another example. It's a construction/laborer. The last in period, when I

say in period, I mean during the SEC evaluation period, result was in 1961. The next result did not occur until 1980.

The claimant has covered employment after that 1961 result in '63, '64 and also 1966 to 1970. And the external dosimetry and location file card indicate assignment to AX, MTR, CPP, TAN, CX and MTX during these latter SEC periods.

And then there's some other statements from the CATI that, again, indicate that there was certainly the potential for internal exposure to fission and activation products.

And I think this is the last example. It's, again, a laborer. Internal monitoring ends in 1960 but the covered employment extends through 1970. Again, there are numerous locations at INL for this Energy Employee after that last internal monitoring result.

And the CATI report was actually with the survivor but they indicate that there were times when they had to take a day off because they

had reached a dose limit.

So, that brings us to Observation 3, and I'll read it in.

It appears there are credible situations where it would be appropriate and claimant-favorable to assign coworker intakes of FAP to account for unmonitored portions of the claimant's work history. Many of these examples predate the period currently identified by NIOSH as requiring coworker evaluations. So, that's really a corollary to Observation 4.

And the summary recommendation, here again, I'll read it into the record.

Based on SC&A's review of 92 randomly selected claimants -- and I guess I should probably read semi-randomly selected, as I talked about before -- it was evident that fission and an activation product bioassay is generally available for a wide variety of job titles. Thus, SC&A does not believe there are completeness issues, and that's in quotations, completeness issues with the

data set of fission and activation product bioassay that would preclude its use in developing coworker models. Nor was there any indication that specific job titles were systematically excluded from the internal monitoring program. However, it is SC&A's opinion that FAP coworker models should be evaluated and developed for each relevant INL site area beginning with the start of radiological operations for each individual location.

And I'd like to sort of expand on that a little bit. We make some, I guess, rather bold statements about completeness and I just want to clarify. This is based on our sample of 92 workers. And, you know, while there were workers that were unmonitored, there were workers that had the same job type that were monitored.

Usually, when we talk about completeness under this sort of a macro level, it would be something along the lines of a particular worker category that would systematically just not captured by the bioassay program and there might

be reason to believe that their exposure was higher.

To really assess the completeness and adequacy essentially would have to go through the implementation guideline process that has been developed by the SEC Issues Work Group and to assess the different areas. You have samples for each area and that sort of things which is -- that just got approved for road testing.

So, while we say that there's no completeness issues, again, I qualified that that's based on what we observed with the sample of 92 claims and does not represent a definitive statement until -- if the coworker modeling process were to proceed, these issues would be vetted more significantly.

So, that's the end of a rather quick presentation. Any comments or questions?

DR. TAULBEE: Nice job. In looking at this, yes, this is something that we can look at in more detail.

I do like the approach and one of the things that might be a little bit of a misunderstanding, when we said that we definitely need -- we need coworker models '67 forward, that was because it was a definite scenario.

I wouldn't say that we completely excluded prior models, prior years, I should say, it was a change in their monitoring methodology that prompted our statement in the SEC where we knew before they were actually doing some evaluation of who should be monitored within the workforce and looking at different job titles and developing frequencies based upon that, at least from 1961 up through 1967.

And then, '67, they went to a random-based sampling model to where it was one-quarter of the workforce was to be monitored and the supervisor was to pick, you know, which quarter, basically, of the workforce.

So, that's what prompted our discussion of we definitely need coworker models from that

latter time period because we knew certain workers that had a potential for exposure were definitely not being monitored.

In the earlier time period I do see, you know, with your evaluation there, we can and we should look at some of these other time periods and areas as far as whether we should be using a coworker model.

And so, thanks.

MR. BARTON: You don't have to be so effusive.

(Laughter.)

DR. TAULBEE: Yes, it was nice.

MEMBER BEACH: So, the action out of that is to review this paper and --

DR. TAULBEE: We will review that paper and respond to that and make a decision as to whether we're going to do coworker models all the way back or not.

So, we will be providing a response to the Work Group on that. We just need to look at

it longer or a little more.

If you do recall from our interviews, we know that there are certain time periods where the trigger for people to be monitored for -- to be sent for follow-up urinalysis was facial contamination coming out of areas.

So, certain workers and I presume a lot of the trades workers that might have had tool contamination or hand contamination, the rad monitors, if you recall from the interviews, they said that they check their faces and if there was no contamination on the faces, they did not send them.

Does that mean we should not have a coworker model? I don't know. But that was one of the reasons that popped into my mind as to why some of these workers might not have been monitored even though it clearly looked like they went into certain areas.

But we will evaluate that further and we'll take on that action item.

CHAIRMAN SCHOFIELD: In the interviews, did they say the rad monitors -- did they take nasal swipes? And, if so, was there a point like 25, 50, 75 dpm where then they were sent to get sampled?

DR. TAULBEE: As I recall from the interviews, it was anything detectible that they sent them.

CHAIRMAN SCHOFIELD: Wow.

DR. TAULBEE: So, it was any facial contamination and when they did the nasal smears if they saw anything, they sent them for follow-up urinalysis or whole body count.

But, I mean, Gen and Josie and John, you were there at the interviews as well. Do you recall anything different than that?

MEMBER BEACH: I sure don't.

MEMBER ROESSLER: I'm glad you reminded us.

DR. TAULBEE: So, but again, that doesn't mean that we shouldn't be having coworker

models for some of these workers there. So, again, we'll take on the action of responding under the -- out of an issues matrix standpoint.

MR. BARTON: And then I'd just add, even for the partially monitored workers, I mean to have a situation where you don't need a coworker model, you would essentially need to have a termination bioassay as soon as they leave the site and never come back.

If you have that termination bioassay, maybe you can work backwards from it, but if you have the last bioassay and they keep working doing similar jobs, you need intakes to assign for that period.

DR. TAULBEE: And I believe there's quite a few people, especially the construction trades that would have termination bioassay and then, four years later, they're back and they have another termination bioassay and it's really for their individual period is what that termination bioassay was. It's not for their actual

termination.

Mr. Stiver: Does anyone have Live Meeting up?

DR. TAULBEE: I do, but it's not doing anything.

MR. STIVER: Any questions? We'll move on to Ron's presentation?

MR. KATZ: Ron?

MR. STIVER: More discussions of OTIB-54 coming your way.

DR. BUCHANAN: Okay, put the first slide on.

MR. STIVER: Hang on just a second. Let me share this.

DR. BUCHANAN: Okay. This is Ron Buchanan of SC&A and what I'd like to discuss now is our evaluation of using a bioassay indicator radionuclide to assign fission activation products and actinides from a little different perspective.

So far, we've talked mostly about calculations, computer-generated codes and stuff,

so what I want to do is actually go out and look for some measured data and see how that compared to what was being recommended.

So, if we could have the next slide.

Okay, so before we can use the ratio method to assign fission activation products or actinides, we have to -- there's four very important assumptions and one was just covered nicely by Bob there. A, that we have a marker radionuclide that we can use and we have sufficient data for that to say, okay, we have the beginnings, we have the strontium-90 or cesium-137 quantitative analysis that we can use to start with, and he just covered that.

B, is that we know the ratios of that indicator to the other radionuclides well enough to assign other fission activation products that are significant. And maybe these always will not be exact, but you know, within a reasonable margin.

And C is that NIOSH use the same method to assign actinides. We know the ratios well

enough. And, of course, that's one reason that prompted the SEC for the chemical plant during that SEC period because they had been separated out. And so, we want to look at the rest of this thing also.

D is special bioassays. Now, if these ratios didn't exist and the ER says there was special bioassays were performed for advanced or there were specialized radionuclides here. And so, we couldn't use the ratio method.

So, we will look at that briefly also.

Next slide.

Okay, so like I say, this presentation addresses Item B, C and D and Item A was already addressed.

Next slide.

Okay, so and most of you are aware now, the recommendation is that you use OTIB-54 with an indicating radionuclide to assign fission activation products. I would like to clarify that OTIB-54 is only for fission activation products,

it is not for actinides.

And so, in OTIB -- in TBD-5 for Idaho, they give two tables in there where they use strontium or cesium as the ratio -- as a measured bioassay and apply a ratio to the actinides.

And so, we will take a look at that also. So far, there's not been too much said about that, but that's equally or perhaps a lot of times more important even in the fission activation products for some internal doses.

Next slide.

Okay, so since Idaho had a wide variety of reactors, over 50, and we wanted to see if the ORIGEN code, okay, it all boils down -- so for OTIB-54 and also the tables in TBD-5 for actinides were based upon computer simulation. And this was the ORIGEN, ran especially for the actinides, was in 1999 or 2000, around that time frame.

DOE asked Idaho to give them the specs on the uranium contaminates, the contamination in the uranium as it was produced in the final space.

One of those documents around the year 2000 said that there had been measurements made in the past of the various radionuclides but they did not retain the records. I hoped that maybe we can find some of those.

But anyway, they said, okay, everything comes to the center is over. Okay? So, that is the hopper that brings in the fuel elements. Now, we have to remember, these come off-site as well as on-site which we're going to talk about in a little bit.

It's a chute that comes down to a sealed vessel and it's got acid in it and it dissolves the fuel elements, the cladding, the uranium and whatever's in it. And then it goes through the cells at the chemical processing plant to be separated out and that's where we get the separation.

But, before that, what we want to look at is anything before that, before it's dissolved.

And so, we wanted to look at some actual

measurements and did we have some benchmarks to say, okay, this ORIGEN run done in around 2000, does it represent what we're looking at here, actually, the workers were exposed to at Idaho?

And so, we search the documents and we searched the NOCTS database, we searched the Site Research Database. We searched the electronic database for some quantitative analysis.

Next slide, please.

So, what we wanted to look was for somewhere where they did quantitative analysis of particular radionuclides, not just gross count for just cesium or just strontium or just uranium and just plutonium. We needed specific isotopes measured in microcuries or something.

And so then, we said we didn't care about the amounts really, we just wanted a ratio. And so, we look at -- some of the things we found, we looked through probably 40,000 pages or so in the documents, and searched and found some nasal swabs.

Now, this is a very good candidate because this actually tells you what the ratio is of the person breathing the material in. You don't have to make any assumptions on that.

Urinalysis can be helpful, you can make certain assumptions there and analysis.

We were fortunate to find some fuel elements scale from outside the fuel that was processed. I'll discuss that, and some fuel storage contamination swipes. In other words, before the fuel's ever processed, they store it, this contamination and we got swipes from there and some air filters in some of those areas.

All in all, we found about 42 quantitative samples that we could analyze for a radionuclide ratio. Now, not all of them had all the radionuclides we were interested in, but they had some, had at least strontium and/or cesium and then one other isotope that could be useful.

So, next slide.

Okay, so I asked how can we evaluate

this and present all this data? So, you see this is one of about 15 of them in my report. We did -- I did a report in October of this year on bioassay at Idaho that addresses these three items in greater detail. But I didn't want to present all that data today.

This is just an example and this is from the Brookhaven Graphite Research Reactor, fortunately, in 1963 which is a ways back.

The quantitative analysis of radionuclides really didn't get going good until the '80s or so when the instrumentation came along and they realized it was important. So, it was kind of hard to find quantitative analysis, but fortunately, they did a very good job here.

About 3,000 fuel elements from this Brookhaven Graphite Reactor came in and were stored and it was too big to transport to the chemical plant for processing. It wasn't practical so they squished them and they compressed them and scale fell off outside.

And so, they, fortunately, they sampled this. They took and they measured the cesium and the strontium at the same time and then these other isotopes as I have illustrated there.

So, these were actual measurements that were measured and given. There was no calculations to them or anything, just determined the ratio.

And so, I decided the way to present this was is, what was a measured ratio? In other words, what was the uranium-234, strontium-90 ratio that we measured on the actual material? And then divide that by the ratio that is recommended by NIOSH for dose reconstruction.

And you see strontium-90 is the basis at the top of the figure. And you see anything in green is one or less. In other words, our measured value was equal to or less than what NIOSH would assign.

In red, it meant that what was measured was actually larger than what NIOSH had assigned.

So, you see if we use strontium-90, we assign it good for strontium-90 because that's a one, cesium-137 would be over, assigning the dose reconstruction using the recommendation within 106.

But the other two would be under-assigned just slightly a bit, obviously the E-144 but by a factor of 10 or 12 on the uranium-234.

Now, the other thing that we looked at was, okay, what if you use cesium? Fortunately, they measured it at the same and you see cesium was bout an eighth of the strontium concentration in this particular reactor fuel scale.

And you see that while we get cesium right, we get all the other underestimated which is the recommendation of the present percent.

So, I did this for this or similar type plot in the same report. And so, this just gives you a snapshot. And all this is really snapshots from 1960 to 2000 or so of samples I defined for quantitative analysis from different areas.

And it just gives us an idea that these ratios weren't always what we would think they might be or would hope they'd be.

The next slide.

Okay, so, the summary of this is that the fission activation products assigned using the recommendations in OTIB-54 based on strontium-90 generally, but not always, there are some exceptions, equal to or greater than those actual measured values. So, this, again, is a snapshot of the 42 samples I looked at.

Next slide, please.

Now, the number two there, we find that the strontium -- the cesium to strontium ratio is not always one to one, as is the cornerstone of OTIB-54 and TBD-5 because sometimes the strontium would be higher than cesium and sometimes vice versa.

And I kind of looked at this to see, well, you know, you're not going to be exact, you know, with a factor of two, one half to two. But

a lot of times, it was like a factor of eight or ten difference.

And so, this is concerning as far as using the ratio method per the suggestion. And so, you can't resort to using just strontium or just cesium because it'd be claimant-favorable because it was sometimes one way, sometimes the other and if the worker was bioassayed for cesium or strontium, would depend on which was the greater dose they assigned.

So, next slide, please.

Okay, the actinide, when we use TBD-5, Table 5-22 is based on strontium-90. Those ratios are in there, all the actinides, the plutoniums, the thoriums, that sort of thing.

Table 5-23 is based on cesium-137 intake. And, in this table, cesium and strontium are about the same ratio. However, a lot of times, regardless of which one you used, you would derive significantly less actinide intakes than what the actual measured value was sampled.

And, again, these didn't require a calculation. I found all the data and that it was already calculated out into microcuries except for the bioassays which I had to make some assumptions.

Okay, next slide, please.

Okay, now, this leads us to the other item, Item D, the special bioassays. And what this was, is, okay, in the ER, they say that there's -- and there would be cases where there wouldn't be a direct correlation and so special bioassays were taken.

And so, if you had a plutonium being worked on in a glovebox, special bioassays were taken as opposed to just measuring the strontium or cesium and using the ratio.

And that's very difficult to address. We'll get to that a little later.

Okay, so next slide, please.

Okay, so from this, what did we learn through all this? Okay, recommendation number one, it's necessary to see if we can find hopefully

the analysis of some of the dissolver contents before it went through the separation process.

And this is important not only for the Idaho fuel elements, which we've been discussing so far today, but Idaho also processed quite a bit of fuel elements from outside as we see, 3,000 from the Brookhaven Graphite Reactor.

And so, we can't just look at Idaho's reactor fuel, we have to look at everything Idaho brought in. And even if they didn't reprocess it, if they just brought it in, they brought in some Rocky Flats material which went to the burial ground.

And so, we have to question, you know, are the recommended ratio methods useful for all of these?

So, our recommendation is in the upcoming data capture, we try to find especially some of the dissolver analysis or what went in before -- before it went into the dissolver, when it was in storage or when it was shipped in or

whatever.

Anyway, this is the area that needs to be, I think, further investigated to determine whether what we found on these samples was the norm or highlighters.

So, next slide, please.

Okay, and especially important in evaluating this and this isn't just in the dissolver, like I say, anything contamination, soil samples, anything that exposures could be -- workers can be exposed to anywhere on the Idaho site and especially looking at -- and look at the cesium to strontium ratio because we need to get that right before we use the ratio method in Idaho with all their special materials and stuff.

So, next slide, please.

Okay, now this special bioassays, now, it's difficult in our days, today looking back, and say, okay, special -- I'll use the term special when there wasn't connected to a fission activation product.

However, if you look back 40 years ago, they weren't looking at the ratio method. They weren't even thinking about it. So, what does a special bioassay mean?

Next slide.

Okay, because it needs to be determined, now in the electronic database and on the hard copies in the Site Research Database, there are some bioassays labeled as special or non-routine.

And so, what we need to do is to determine does this mean like somebody working in the glovebox with plutonium-238? Or does this just mean that, hey, an event occurred, a person was exposed, we need to know what his dose or his intake was right away, so that's a special bioassay or non-routine, which gets moved to the front of the line, priority over the routine bioassays.

I think that probably some of the upcoming interviews, we could ask some people, you know, what was special about -- what constituted

a special bioassay in the records? And if an event did occur, how was it determined whether a special bioassay was taken, so that we can identify in the cases which we see more and more that there are circumstances where they aren't tied together to a fission activation product, were their actinides adequately monitored so that dose can be assigned when there wasn't a link to a fission activation product or that wasn't taken.

At that time, they probably didn't take both because if they were working with plutonium, they probably weren't necessary, they didn't think they needed to take a strontium sample.

So, that's our recommendation for upcoming visits.

And so, next slide, please.

That concludes a very brief summary of what we worked on, on the overall bioassay that addressed all the sites, all of the areas at INL and where we're at on it today.

So, open for questions and comments.

MR. KATZ: Tim?

DR. TAULBEE: Yes, I do.

One thing I would really like to caution the Work Group and SC&A on is the use of the INL electronic bioassay data set. I had mentioned that earlier today.

We no longer consider that data set to be valid. We are completely recoding it. So, please be cautious with anything that you use that for or conclusions you draw from it.

We have found significant errors in it and these are our mistakes. These are things that we made when we coded it out of there such that we are completely redoing it, is the level of uncertainty and problems we found within it when we did our own QA.

So, please be cautious on that. I know recommendation number three was saying to do some follow-up on that with the special in the routines. Interviews are fine to, you know, try and ask that, but please don't try and draw any conclusions from

that because that will very likely change when we get the new data set coded.

MEMBER BEACH: What's your time frame on the new -- on recoding? You knew somebody was going to ask that.

DR. TAULBEE: Actually, at this time, I don't have a real time line.

MEMBER BEACH: Is somebody working on it or --

DR. TAULBEE: They are beginning to work on it --

MEMBER BEACH: -- it's on the -- okay.

DR. TAULBEE: -- is what is currently happening.

DR. BUCHANAN: Would you please let SC&A know when you do repost it so we won't have to keep checking for it? That would save us a lot of time.

DR. TAULBEE: We can certainly do so, no problem.

DR. BUCHANAN: Thank you.

DR. TAULBEE: The other thing that I would say is that with your data captures that you're coming up, there is a wealth of spectroscopic, spectrographic, I don't know which is the right word, scopic -- information out there on other samples.

If you're considering looking at fuel scale for what the isotope breakdowns are, I would encourage you to look at some of the water samples from the canals themselves, the spent fuel pool canals, as well as some of the air samples that are coming out of the building. Those are also analyzed for isotopic at different time periods.

As I recall, the waste reports themselves also have a breakdown of isotopics within them. And so, these are all other sources that you could look at if you're looking at other samples beyond the nasal smears and the urinalysis to draw your conclusions here.

I found personally there is probably more air sample and water data from the spent fuel

pools than we cared to capture, let me tell you that. There are literally thousands and thousands of results.

So, you might want to look for those in their system, the EDMS system and poll some of those boxes and capture what it is that you're interested in.

CHAIRMAN SCHOFIELD: Answer one question for me and correct me if I'm wrong. But a majority of the rods are either uranium, plutonium or a mixture of the two. How common were fuel rods with thorium?

DR. TAULBEE: With regards to how were they with thorium or were there any?

CHAIRMAN SCHOFIELD: Were there any?

DR. TAULBEE: Not that were processed through the CPP. Now, there were some that came in from Peach Bottom and they were cut and there is some isotopic analysis associated with those when they were doing the analysis down in the 603 building, I believe it was.

And so, there is that particular project from the Peach Bottom fuels.

The bulk of them are all enriched uranium. That was what was dissolved in the dissolvers. The plutonium fuels were not dissolved there at CPP. It was just the high-enriched uranium for the recovery process.

Now, from that, any time you're irradiating enriched uranium, you're going to get some plutonium and that was what they started extracting off that caused us to recommend an SEC, was they started pulling off that plutonium in order to reprocess it. Or to recover it, I should say, not reprocess it.

CHAIRMAN SCHOFIELD: If I remember right, I was reading they had a program for a while and I don't remember the years where they were taking the spent rods and they were taking the fuel from them or, in some cases, mixing them with, what was that, a glass, boron glass and making slugs out of it to stabilize it. Was that during the SEC

periods?

DR. TAULBEE: I do not believe so. I do not recall running into anything like that in the -- up through 1975 time period.

CHAIRMAN SCHOFIELD: Yes, I didn't know if it was after that or not.

DR. TAULBEE: Yes. And there was a statement earlier, I can't remember which one of the presentations said something about looking, you know, outside of the SEC evaluation time period. You know, that, I believe the statement said something about, you know, NIOSH's okay with outside-the-SEC time period for dose reconstruction.

I wouldn't say that. With the SEC's, we clearly evaluate a time period. We don't go beyond that particular time period unless we find an infeasibility which is what we did at CPP and then we track that down until we find a clear change or something that might indicate a change and then we'll cut off the research.

And then if we, in this particular case with CPP, we said that we were going to look further to see if these implementation things happened under the 83.14.

But we really haven't said anything about other operations at INL in -- outside of that 1970 time period except for at CPP. CPP we looked further. The other areas we did not and have not.

MR. STIVER: Those being the ones that are in reserve at this point?

DR. TAULBEE: Correct. The reserved ones. In the current reserve ones, we're only looking up through 1970 unless we find an infeasibility and then we'll go beyond. But, right now, we are just looking up through 1970.

MEMBER BEACH: So then, where does that leave us with this report? Is there any actions other than waiting for the recoding to be done? Is there any -- are you going to review it and --

DR. TAULBEE: My preference would be for, I guess in a sense you all to update, you know,

based upon --

MEMBER BEACH: So, wait --

DR. TAULBEE: -- your current -- you're planning to do some data capture out there to look at some of that data and then when you issue a new one, then we would address that.

MEMBER BEACH: So, the data capture, the recoding and then this would have to be resubmitted? Is that what we're -- I'm just trying to get a sense of where we're at.

MR. STIVER: From an SC&A standpoint, the upcoming data capture is going to look into this issue, the issues that Ron has identified.

MEMBER BEACH: Okay.

MR. STIVER: And, actually, Joe is going to be out there next week for the Board meeting.

MEMBER BEACH: He's going to be polling some boxes, yes.

MR. KATZ: So, John, there will be a follow-on SC&A report that'll be sort of a complete

report on this, is that what you're saying?

MR. STIVER: Yes, just kind of a preliminary report we've found so far based on those 42 samplings, and, you know, with high and low for additional, you know, data. And we mentioned also the spent fuel pool and the air sampling could be another good thing to look at.

So, we are going to be looking at a broader representative data set and actually make some recommendations.

Are there any other questions for Ron?

In that case, I guess we can go ahead and move on to Doug's presentation on the central facilities.

Okay, Doug, are you still on?

MR. FARVER: I'm still here.

MR. STIVER: Okay, good. We're ready to go.

MR. FARVER: Fine. I appreciate you bumping me to the end because everyone else set the groundwork. That means I don't need to cover much.

MR. STIVER: Yours should be quite easy, then.

MR. FARVER: You can go on to the next slide.

Basically, I looked at the central facilities area. And just to give you an idea of what that is, it's probably what you think it is. It's where a lot of the common facilities were, like the medical, receiving warehouse, health physics and health and safety labs and offices. So, a lot of your centrally located facilities.

And of the many facilities, there are probably, I don't know, four or six that have, we'll say a contamination or an intake potential that I would think. Things like the machine shop, maintenance shop, the hot laundry, the chemical engineering lab, possibly a sewage treatment plant. So, it was just a few areas to look at.

And like the other folks we heard today, there's a lot of interest and concern about using your beta-gamma bioassays and going in and

assigning actinide intakes. And such was the concern here.

So, I just propose to look at survey data that was available or whatever data I could find and then just see how it compares to the TBD values.

Next slide, please.

Pretty much what we talked about today, they proposed to use the mixed fission and activation product bioassays and fixed actinide intakes. We can move on.

And rather than putting the two tables on there from the TBD, these are just the maximum values from Table 5-22 and 5-23 just to give you an idea of what kind of levels we're looking at, the ratios.

And if you want to just keep in mind, like the U-234 and the Pu-238, you're looking at somewhere in the range of ten to the minus two, ten to the minus three for your actinide to whatever ratio.

Okay, next page.

So, I looked to see what kind of surveys I could find on the SRDB for the CFA facilities. Well, I didn't find much, now I understand why because they just were doing a sampling and that's okay; I understand.

I did find some contamination surveys of the hot laundry and the chemical engineering lab. It was about 70 pages of surveys and some were just beta surveys, some were just alpha surveys, some were beta-gamma surveys. It was a mix.

And there was a report from the D&D of the laundry. Actually, it was after the D&D, it was just some soil samples from an excavation in their final report. So, there wasn't a whole lot there.

There should be a document out there that talks about the characterization and decision analysis for the hot laundry, but that document was not available. So, it probably exists and probably has a lot of survey data in it.

Now, on the survey data, I just want to look at the beta-gamma and the alpha results that were, number one, greater than background, and, two, were taken at the same location at the same time. We're trying to compare similar ratios.

There were 85 contamination survey results that met that criteria. There were six from a survey that just didn't look right. It looked like they got their alpha and beta-gamma results transposed.

And on some of these surveys, they'll use blue ink for beta-gamma and red ink for alpha. And I think they just got them mixed up because they just didn't look right, so I discarded them.

The other thing, the survey results are given in counts per minute.

Next page.

So, I've got the results of my counts per minute, I've got a gun to dpm. I found a couple memos that the counting equipment, even in 1972 was from the '50s. And I found some data sheets where

you gave me a counter yield for beta-gamma and alpha.

So, I'm hoping that things were similar and I applied those two values and converted to dpm.

Now, it's always very iffy when you're going back like this because I don't really know if that's the correct way to do it. The surveys are old, the information's old and this is one of the things we'd like to talk about later, is if we have more recent information with some more recent methods.

Next page.

This is just an example of one of the better surveys from the engineering lab. They're all handwritten and I'm not sure if you can see in the upper left corner, the ones that have, like, double underlines, you can see the ratios of alpha to beta-gamma just in the cpms.

And they can, you know, it's almost one to one where it says 18 alpha and 17 beta-gamma. And then it's much lower than the other ones.

So, I just wanted to give you an idea that this is kind of what the surveys look like.

The next one is the survey of the hot laundry. It's very similar and you can see that it can bounce around. There's that one that's about in the center of the page, it's double underlined, zero alpha, 2440 beta-gamma. It could be a particle, most likely a particle.

But, anyway, so you would -- I would take these values and put them into a spreadsheet, so they were taken at the same location and they were greater than background.

Okay, next page.

There were also some soil samples taken from an excavation from the contaminated sewer line. They were analyzed for alpha and gamma spec and also strontium-90.

They have 274 and the uranium and plutonium levels were pretty much like environmental levels. I don't think they subtracted anything out from them. So, I pretty

much discarded the uranium and the thorium results.

Next.

So, what we're left with is some curium and plutonium results you can look at, some strontium and cesium results. I show you the mean values. And in the second and third rows, you can see the ratios that we're looking at.

And, if you remember, I told you there's the plutoniums from the table below here, we're looking at ten to the minus two, which about falls in line with that plutonium.

It's a small number of samples but it's interesting. It's just closer than the curium.

Next page.

We go to the survey results and of the, I think there were 79 of these results, you can see that there's quite a few below the .05. And, really, if you look at the .1, I think that works out to about 58 percent of the results of below .1 which is going to put you at the, you know, minus 02 magnitude.

So, while this isn't conclusive, this is interesting. It looks like things are trending lower.

Next page.

And when you look at the soil samples and you compare them to the NIOSH values which would be from the tables in the TBD, you can see with the curium, you're looking at the E to the minus fifth is what the NIOSH table would predict.

And we didn't see that, but it's a very small number of curium samples that were even usable.

The plutonium's closer and you can see that's within 50 percent of the NIOSH, so it's pretty close. So, it may not be a bad method if you have more samples to look at.

Next page.

So, when you look at the soil samples and the smear samples, there is some kind of general agreement in the magnitude for like the uraniums and the plutoniums, but the data's not very good.

It was only from the -- the survey data was from the early operational period of the laundry. It operated from 1951 through 1980, I believe, about 30 years. And there was only three years of data that was looked at. So, that's not very good.

We had some problems interpreting the data into a dpm. Some more recent data might be more helpful.

The soil samples were collected during D&D. It'd be nice to have them prior to D&D, like characterization data or other type data.

I did not find any air sampling data. That could be useful data to look at and make comparisons.

Next page.

So, that's about it. We just came up with some general type of agreement and it's possible, but there's more data that needs to be looked at. I would look for more recent data for the laundry and maybe for some of the other facilities and also, if air sampling data or other

operations data does exist, by all means, put it together and look at it.

Any questions, comments?

DR. TAULBEE: The only question I have for you is why did you look at curium-244?

MR. FARVER: Because it was one of the values in the soil samples that was analyzed.

DR. TAULBEE: Okay.

MR. FARVER: I think it was only in maybe two of the samples that it even showed up. It's not very reliable, that number.

DR. TAULBEE: Okay. Because the vast majority of the fuels that were handled at INL are short burnup fuels. There's very little long burnup where you would end up with any significant curium-244 with any of the operations.

MR. FARVER: Right. I understand that's a questionable number and it was only in a couple of samples. But, like I say, it'd be better if you looked better data, but this was all I found at the time.

DR. TAULBEE: Okay.

MR. STIVER: It also raises the question as to what may have come in from off-site, too. It was longer burnup materials could have found its way through the laundries for the various exposures.

DR. TAULBEE: Well, generally, the things that have curium that you're starting with plutonium from your burnup standpoint, like Savannah River, for example, producing curium.

These fuels, even the higher burnup, you know, naval fuels that were for a long period time were starting the Q-235, so you still end up with very little curium from even their long-term burnup.

So, that was why I was questioning that. It makes some sense if, you know, they reported it in one of their D&D reports in latter years just because they could is really all that it was. But I certainly wouldn't be expecting it.

MR. FARVER: Exactly. It showed up on

an analysis from their -- and they just put it in the report. It's not real, I'm pretty sure it's not real.

MEMBER BEACH: So, is additional data capture needed for this to get more data points or --

MR. FARVER: I would recommend that either NIOSH do it or SC&A, someone look at more data. I think this -- if you can validate your TBD tables, it would be very helpful, at least to show that you're in the same order of magnitude.

MR. STIVER: Is Joe Fitzgerald still on the line?

MR. KATZ: No, he's not. He sent us an email saying he had a meeting.

CHAIRMAN SCHOFIELD: You mentioned the naval fuels. Now, the sampling for those in particular, they were lower-level enrichment and had to be extremely low americium content when they put those into the --

DR. TAULBEE: They were not low

enrichment, the naval fuels weren't.

CHAIRMAN SCHOFIELD: I thought they were lower enrichment.

DR. TAULBEE: No, they were enriched fuels.

CHAIRMAN SCHOFIELD: Yes, I know they were enriched fuels, but I mean they were worried about the exposures particularly on the subs.

DR. TAULBEE: I believe they're highly enriched.

MEMBER BEACH: We were talking about maybe modifying the data capture coming up for SC&A to add maybe this parameter also.

DR. TAULBEE: That seems appropriate to me.

MEMBER BEACH: That seems reasonable.

MR. STIVER: That can be the EMS searches, right. Yes, so okay.

MEMBER BEACH: All right, is it time to go over actions or have we got more to do?

MR. STIVER: This is all that SC&A has.

MEMBER BEACH: Get some actions out before Bob leaves because he might need to pick up a few of them.

I've got four for NIOSH and one, two, three for SC&A.

MR. KATZ: Do you want to run through yours as a starting point?

MEMBER BEACH: Okay, so I have for NIOSH, review those 18 cases and then the firefighters is added on to that.

And just as a question --

DR. TAULBEE: Is that part of one or is that --

MEMBER BEACH: That's part of the first one, yes.

DR. TAULBEE: Okay.

MEMBER BEACH: And then, I wrote down the question I know you guys won't be able to answer it right away, but how will the Class be administered by DOL?

And I'm more curious on that one, just

because I know DOL counted on you guys in the past for a list. So, I'm curious of if you're going to do that.

DR. NETON: We've had a discussion with them on this already.

MEMBER BEACH: So, it'd be nice to --

DR. NETON: I can't remember when it was but we did have a discussion.

MEMBER BEACH: And then, White Paper for the TAN number ten item. We closed, I think we said three and four and so ten was still open and you guys were --

DR. NETON: Writing T-10, yes.

MEMBER BEACH: -- committed to that.

MR. STIVER: Is there a possible date on there for TAN number ten?

DR. TAULBEE: After March.

MR. STIVER: After the March meeting?

DR. TAULBEE: And you keep in mind, we've got the INL.

MEMBER BEACH: And then, I have review

and respond to SC&A's evaluation of the internal monitoring fission activation and I paraphrased it 1949 to '70, and determine the coworker modeling. That's kind of what I got out of that.

And you guys really need to bring these headings down a little bit on your papers.

MR. STIVER: Yes, yes, we can work on that.

DR. NETON: We're going to look at the applicability of those coworker models prior to '57.

MR. STIVER: Yes.

MEMBER BEACH: And then, I had let SC&A know when you updated that electronic database on the recoding when it's complete.

And then, for SC&A, I had, give the Work Group detailed list of issues with the 52 reactors that OTIB-054 may not cover. Did I capture that okay?

And put together an issues matrix or at least get one started.

MR. KATZ: Is that a list of priorities? Is that what you're talking about?

MEMBER BEACH: Yes, list the priorities of the --

MR. KATZ: In the priority order, in other words?

MEMBER BEACH: Yes. I should have said priorities and not issues.

MR. KATZ: Yes.

MEMBER BEACH: And then put together start of issues matrix. And we need to go back to what we've closed, too, and combine that from previous meetings?

MR. KATZ: Yes.

DR. TAULBEE: Right.

MR. KATZ: Yes, make it current --

DR. TAULBEE: Retroactive.

MR. KATZ: -- with everything including what we've covered.

MEMBER BEACH: And then, the last thing I had was update Ron Buchanan's evaluation of the

proposed -- so this -- his last White Paper with the data capture.

And then, I didn't add it, but you're going to add or modify the data capture?

MR. KATZ: Right.

MEMBER BEACH: For those last two items?

MR. KATZ: Yes.

MEMBER BEACH: That's all I had.

DR. TAULBEE: Could you go back to the beginning of the list you had for SC&A because I was making a note here and I missed that.

MEMBER BEACH: Oh, to give us a detailed list prioritizing the 52 reactors --

DR. TAULBEE: That's what I wanted to make sure of.

MEMBER BEACH: -- under 054.

MR. KATZ: Other reactors that may have issues.

DR. TAULBEE: Yes. Because I wasn't sure if you covered it, so you did.

MEMBER BEACH: Yes.

DR. TAULBEE: Got it, yes. Good.

MEMBER BEACH: That's all I had.

MR. KATZ: Yes, I think that sounds right to me.

MEMBER BEACH: And then, we need a Work Group meeting in January.

MR. KATZ: We need it in January and I'll send out a notice for that because we already know sort of when we want it anyway.

MEMBER BEACH: Yes, before the 20th.

MR. KATZ: Yes, the week before basically.

I mean, if you guys can tell me no-go dates now for those that are here, that's fine, I'll take those and run with those and then not send out a possible date that doesn't work.

MEMBER ROESSLER: Let me look at my calendar.

MR. KATZ: Yes, I'm just saying for anybody that has in hand the -- Tim in particular.

MEMBER BEACH: The only thing is that data captures. They were trying to get December, but it looks like it might not be until January.

MR. KATZ: Or, you want them to be careful not to schedule it for when we're trying to get this Work Group meeting. You don't want data capture when we're trying to meet.

MEMBER BEACH: Yes, so that's --

DR. TAULBEE: Have a safe trip, Bob.

MEMBER BEACH: Bye, Bob. Thanks.

MR. KATZ: Unless it's just -- unless it's someone --

MEMBER BEACH: Well, we're going to be determined on what the site can do. We're not --

MR. KATZ: Yes.

MEMBER BEACH: -- going to have a lot of choice, I don't think. I mean, how's that work?

MR. KATZ: Well, there's usually latitude in the scheduling, right?

DR. TAULBEE: The site has generally been pretty -- quite cooperative from that

standpoint.

Yes, I mean they're going to say, you know, please don't come the week of -- between Christmas or week of Christmas and the week after for sure.

MEMBER BEACH: Yes, yes.

DR. TAULBEE: The fourth is getting a little bit questionable because that's right after when everybody is returning. So, they might have a lot of people out the week of January 4th.

We're looking to do a Work Group call the week of January 11th.

MEMBER BEACH: Right.

DR. TAULBEE: And then --

MEMBER BEACH: Which would be kind of the week -- probably the Idaho -- ideal Idaho week.

MR. KATZ: Well, I mean it's not ideal, though, if we want to have a Work Group meeting. Right? I mean --

DR. TAULBEE: It's not, but well it is and isn't, really.

MEMBER BEACH: Yes.

DR. TAULBEE: Because if you have multiple people out there.

MR. KATZ: Well, if they can get to the phone in time.

MEMBER BEACH: I bet they could set that up. They have before.

DR. TAULBEE: We could get a phone line conference. I mean you could request that of Craig and you could probably do that.

I don't know how many -- what are you planning to do in the January data capture? I mean, what is your goal?

MEMBER BEACH: Interviews I know for sure and then whatever Joe pulls now.

MR. STIVER: Yes, the list of interviews. We're looking at burial grounds, you know, recollections as well as data, CPP, 3, 63, Ron's issues and now we're going to have this CFA.

DR. TAULBEE: Okay, so you're primarily wanting to do interviews?

MEMBER BEACH: Primarily, yes.

DR. TAULBEE: Okay. And you've notified who? I saw some of the people on the list that you provided the data capture staff when you want to.

Okay, have you been reaching out to contact them or --

MR. STIVER: Lynn Ayers is working that angle. I believe she's working in kind of conjunction with ATL.

DR. TAULBEE: She hasn't been working with ATL yet.

MR. STIVER: That was the -- I can't tell you exactly.

MEMBER BEACH: That's a Joe question probably to see --

MR. STIVER: Okay, I've heard work with Mark Lewis.

DR. TAULBEE: Okay, because --

MR. STIVER: Along with --

DR. TAULBEE: -- this is where we're

getting into a little bit of contractor type issues. ATL is the contractor for us and so we have not tasked ATL to do this yet because I needed to know more information from you on when you're wanting to do this and that type of thing.

MR. STIVER: We'll talk to Joe and we'll get back with you on it.

MR. KATZ: It just seems like it's better to do that data capture the following week and leave that week that we want a Work Group meeting clear because what's the difference is a week going to make? No difference.

MEMBER BEACH: True.

MR. KATZ: Because the data capture is not --

DR. TAULBEE: Well, the following week is your Advisory Board conference call.

MR. KATZ: Okay, but that's 11:00 to -- right.

MR. STIVER: And anything we're able to capture there's not going to be definitive time

limits for our meeting anyway.

DR. TAULBEE: Well, yes, absolutely.

MR. KATZ: Most of the SC&A staff aren't needed for a conference call with the Board. So, most of them aren't relevant for the conference call anyway.

So, we need Josie, of course, but we need the Board Members for the conference call.

MEMBER BEACH: Yes, I think just reaching out to Joe mostly to find out where he's at. I know he sent out the plan but as far as if he's contacted Lynn to, obviously, not contacted ATL. I think he was waiting for something back from the site because he kind of left it in December but he didn't think it would happen until January.

MR. STIVER: Yes, we had talked about that. December is pretty much -- pretty unlikely. It's going to probably be in --

DR. TAULBEE: Well, Craig Walker from the site, he is out until after Thanksgiving, he'll be back that very next week. But, right now, he's

the point of contact.

So, if you're targeting the week of January 18th, that's great.

MR. KATZ: And if we can --

DR. TAULBEE: That's something that I can go back to ATL with or Grady because I think he's got to do a task order for them to go about the assist. But I needed to know dates and names of who it is you're looking at.

MR. STIVER: Yes, I think the bottleneck as far as doing the December meeting is lining up all the interviews.

MR. KATZ: And there isn't time to do that for, like, the second week of December?

MR. STIVER: I have to get the other.

MR. KATZ: Well, that'd be nice.

MR. STIVER: That would be nice, but it's not going to happen beforehand.

DR. TAULBEE: Let me know then, the sooner the better from that standpoint.

MR. KATZ: I mean, that's a month out

for the standpoint of the interviewees. I mean it's a lot of time to schedule with interviewees.

MEMBER BEACH: Sounds easy.

(Simultaneous speaking)

MR. KATZ: How long is your list?

DR. TAULBEE: Getting the schedule list.

MEMBER BEACH: And then you've got all the holidays and.

CHAIRMAN SCHOFIELD: I think that's it.

MR. KATZ: Okay, so we are adjourned today.

Thank you, everybody, who hung in with us on the phone and especially for all the folks who participated and presented. Have a good day.

(Whereupon, the above-entitled matter was concluded at 2:52 p.m.)