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

convenes the

WORKING GROUP MEETING

ADVISORY BOARD ON

RADIATION AND WORKER HEALTH

CHAPMAN VALVE SEC

The verbatim transcript of the Working Group Meeting of the Advisory Board on Radiation and Worker Health held in Cincinnati, Ohio on April 10, 2007.

C O N T E N T S

April 10, 2007

TRANSCRIPT LEGEND

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-- (inaudible)/ (unintelligible) signifies speaker failure, usually failure to use a microphone.

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P R O C E E D I N G S

(9:30 a.m.)

WELCOME AND OPENING COMMENTS

DR. LEWIS WADE, DFO

DR. WADE: Okay. This is Lew Wade and -- and my role is serving as the Designated Federal Official for the Advisory Board, and this is a meeting of a workgroup of the Advisory Board. This particular workgroup is focused on the Chapman Valve SEC petition. This workgroup is chaired by Dr. Poston, who is here in the meeting room. Members are Griffon, Clawson, Roessler and Gibson. And I've identified all of their presence on the telephone.

What I'd like to do is start around the table here and do introductions. I'll start with members of the NIOSH team and extended team, then we'll look for representatives of SC&A's team, then we'll look for other federal employees that are on the call, we'll look for worker/worker representatives, members of Congress or their staff who are with us, and then anyone else who would like to identify

themselves.
As we do the introductions, particularly the NIOSH team, the SC&A team and the Board members, I'd like you to identify whether you have any conflicts relative to this site -- that is Chapman Valve.
MR. ROLFES: My name is Mark Rolfes. I'm a health physicist with NIOSH. I have no conflict of interest.
DR. NETON: I'm Jim Neton. I'm with NIOSH. I have no conflict of interest.
DR. POSTON: John Poston, Texas A&M. I have no conflicts.
DR. MAURO: John Mauro, Sanford Cohen & Associates. No conflicts.
MS. HOMOKI-TITUS: Liz Homoki-Titus with HHS. No conflicts.
DR. MELO: Dunstana Melo, SC&A. No conflicts.
MR. ELLIOTT: Larry Elliott, NIOSH. No conflicts.
DR. WADE: It's back to Lew Wade. Other than Ray, who's here and working, no one else is in the room.
Let's ask on the line for other members of the NIOSH team to identify.

(No responses)

Other members of the NIOSH team?

(No responses)

Other members of the SC&A team?

(No responses)

Board members, starting with workgroup members, Mark Griffon?

MR. GRIFFON: Mark Griffon, no conflicts.

DR. WADE: Brad Clawson?

MR. CLAWSON: Brad Clawson, no conflicts.

DR. WADE: Gen Roessler?

DR. ROESSLER: Gen Roessler, no conflicts.

DR. WADE: Mike Gibson?

MR. GIBSON: Mike Gibson, no conflict.

DR. WADE: Are there any other Board members on the call, other than the workgroup members?

(No responses)

Okay. Other federal employees who are on the call by virtue of their employment?

MS. HOWELL: Emily Howell, HHS.

DR. WADE: Welcome.

MR. BROEHM: Jason Broehm, CDC Washington office, no conflicts.

DR. WADE: Other federal employees?

MS. CHANG: Chia-Chia Chang, NIOSH Director's.

DR. WADE: Any other federal employees?
MS. DOWNS: Amia Downs, NIOSH.
DR. WADE: Welcome. Any workers, worker reps, representatives of petitioners?
(No responses)
Members of Congress or their staff?
(No responses)
Portia, I know you're with us.
(No response)
Is Portia still with us?
MS. WU: Yes, I am.
DR. WADE: Okay, good. Thank you for joining us.
Anybody else who would like to be introduced for the record?
DR. MAKHIJANI: This is Arjun Makhijani from SC&A. I just joined.
DR. WADE: Welcome, Arjun.
MS. BLOOM: And Cindy Bloom is on the line --
DR. WADE: Okay.
MS. BLOOM: -- from the ORAU team, and I have no conflicts.
DR. WADE: And Arjun, you're not conflicted at this site, I assume?
DR. MAKHIJANI: No, I have no conflicts.

DR. WADE: Okay. Anybody else who needs to be identified?

(No responses)

Again, by way of telephone etiquette, if you're not speaking, then mute your instrument. If you are speaking, speak into a handset as opposed to a speaker phone. And be aware of background noises where you are because they become background noises and distractions for all of us. So with that, John...

DR. POSTON: Thank you. What I would like to do today, and the goals for today are fairly simple -- there's been a couple of communiques, one from SC&A and one from NIOSH, that we need to talk about. I'll play my cards face-up. I think there's no problems. What I would like to do is hear from John and -- and from Jim because the report from NIOSH we have not read. And the goal today would be to wrap this up and bring it to the full Board in the May meeting in Colorado.

Those are the goals for today. I hope this can go fast, but I want to make sure that everybody has a chance to express their opinions and so forth.

John, you want to start or –

NIOSH REPORT

DR. NETON: We can do that, then there are actually --

DR. POSTON: Or, Jim.

DR. NETON: -- three -- two issues I guess that we -- in my mind that we need to talk about. One is the adequacy of the exposure -- internal exposure model matrix and there's been at least two correspondences back and forth between us and SC&A. Then the second issue is that -- is related to the document that we sent out yesterday afternoon. It talks about sort of a reasonableness evaluation of the exposure model itself and does that bound most or all jobs in the machining operations in the uranium facility.

DR. POSTON: Well, that one of course has the most interest because some of us haven't read it.

DR. NETON: Right, and I -- I -- we're prepared to provide a brief summary of some of the salient features in here. Maybe we can start with the exposure model, SC&A's evalu--

DR. MAURO: Yeah, perhaps I could sort of set

the stage and then we'll mature into the more recent material that I think addresses some very focused issues.

And when you step back, when all is said and done, the -- the fundaments of this exposure matrix that was developed is -- is based on approximately 40 bioassay samples, and also quite a bit of film badge data. I don't believe there is any issue -- now please, anyone chime in -- regarding external dose reconstruction. There's lots of data. Just about everyone was badged. We do know there were some individuals that were not badged, but by and large there's a -- a complete record -- a fairly complete record for external so I -- unless anyone feels that that needs to go on the agenda for some discussion, I feel as if that is -- has been taken care of.

The -- with regard to internal exposure, we have these 40 bioassay samples. We believe that the -- the -- and they're expressed in terms of mass, milligrams per liter. By and large, one of the issues that emerged during the course of this -- these discussions was well, are we certain that we're dealing with

only natural uranium, and there was some discussion whether or not it was possible, based on some sampling that was done in 1990, that there might be some enriched uranium that was also there.

I think we, SC&A -- and again I please ask -- like for example, Arjun on the line, if he has any perspective on this. We believe that though there was some -- some -- a couple of samples that showed possibility that there was some enriched uranium in some of the sa-- one -- at least two of the -- in two of the samples, we don't believe that that -- it -- the weight of evidence appears to indicate that -- that if those are real values, they did not occur as a result of the activities that took place during the contract period, 1948 to 1949. We believe that if -- the evidence appears that -- that during that time period the only thing -- materials that were being handled by Chapman was natural uranium to support the Brookhaven reactor. If there was some residual levels of enriched uranium, it was -- it may have been associated with work that occurred previously for various reasons that we don't need to go

into right now but occurred before the contract period, or perhaps after. So I think that that issue is -- by and large meets our satisfaction. That is, it no longer is an issue that we're concerned with.

Finally is -- is the matter of -- and this is the -- the issue that I think that the -- the petitioners were especially concerned with, and that is we have 100 workers -- approximately 100 workers -- that worked at the facility for about a year and -- the period -- the period covers about a year and a half as the -- the area mo-- time period of most importance, and we have 40 bioassay samples. And the question becomes whether or not those 40 bioassay samples by -- in and of themselves are adequate to allow NIOSH to build an exposure matrix to place and upper bound on the -- all workers so that we could be sure that no workers' exposures are -- are underestimated. And the -- and when we looked into this, we -- we broke that issue up into two questions, is -- one is, the matrix itself makes use of a chronic intake -- assumes that all workers are chronically exposed at a given level. But there's one set

of workers in the -- that also works -- in addition to the chronic exposures to airborne uranium, they're also exposed to a -- a spike associated with a fire.

Now the issues that emerged during the course of our review had to do with -- I think that we've all bec-- are very comfortable with the chronic portion; that is, the baseline intake that was assumed that occurred over approximately a ye-- over a year. In fact, we consider that to be a con-- very conservative. That is, basically the intake rate that everyone is assumed to experience chronically is assu-- is -- is a relatively high value based on the bioassay results and other data that Jim is probably going to talk about a little more later. And al-- in addition, it's assumed that that exposure occurred -- not only the time period between January and November when -- well, really April and November when the machining was going on. It was assumed to extend from January of '48 right through April of '49, so -- so the ge-- the basic model, in our opinion, extends the period over which exposures occur to a period that probably is --

is quite conservative. So in the end, where we're coming down is that the -- for the chronic exposure time period -- exposure scenario, the -- the -- or the consensus at SC&A is that yes, that is quite claimant favorable.

Which leaves us with the last piece, which is I think the reason we need -- which has to do with short-term acute exposures, and there are two aspects to that that have been a matter of quite a bit of discussion and exchange recently of e-mails, work that Dunstana has done, work that Jim and NIOSH has done, and the two issues have to do with -- one, I call it the issue related to fires, fire -- or fires. And the other has to do with issues rela-- whereby some acute exposures could have occurred.

And the other issue has to do with the possibility that there was -- and we believe there was -- an incinerator that was used to roast the turnings and other material -- uranium and oxidize it. Both of those types of activities or occurrences have the potential to cause a spike in the exposure, some short-term period.

There -- the -- so perhaps the best way to deal with this is to first talk a little bit about the fire and where we stand right now regarding that and some of the issues. And then perhaps we could then move on to the incinerator, if that's acceptable.

With regard to the fire, the issue that arose -- and this is an issue that I brought up and that Dunstana helped out with -- is that there was a urine sample -- set of urine samples collected on July 11th, 1948. Tho-- for seven people. And those urine samples were collected because there was a fire. In other words -- and it seems clear that that was the reason they went and collected those urine samples. The problem we ran into is that well, when did the fire occur? Because, you know, if you know what the -- and if -- and amongst those seven individuals where those seven samples were taken, the highest one was .08 milligrams per liter. So on that basis you could say well, if you observe .08 milligrams per liter on June 11th, 1948, you could probably back-calculate what was the acute exposure from the fire that must have occurred in order to cause the .08.

And here's the point -- first place where we, you know, had some discussion.

NIOSH has adopted the assumption that the exposure occurred on June 10th. Our point was well, you know, from the literature, it looks like the exposure could have occurred earlier, maybe as early as June 1st. And we -- we very simply looked at it and said well, what would the intake have had to have been if the intake occurred on June 1st -- or the 2nd or the 3rd -- as opposed to June 10th. And if -- if you say that that's plausible, then all of a sudden the intake -- the acute intake associated with the fire -- if it was on June 1st, for example, would have had to have been 50 times higher than if the intake acute occur-- occurred on June 10th and still get .08 milligrams per liter in urine on June 11th.

Now Jim has provided us with material -- I'm almost through and I'll let you take it over -- I'm sort of just trying to set the table and -- so everybody's on the same page.

Now Jim has provided material in the -- a previ-- the one before the one that came out last night -- that said okay, we have three

reasons why we believe June 10th is the right date and therefore the intake for the acute intake from the fire is -- is the correct value. And the -- the one that -- the three reasons, and they're really independent reasons, as I see them, is that -- one is if that intake occurred earlier and it was 50 -- for example, June 1st, and it was 50 times higher, the dust loading would have had to have been in the hundreds of milligrams per cubic meter and these fire fighters would have had -- would have experienced dust loadings for an extended period of time, perhaps eight hours -- on that order -- on the order of several hundred milligrams per cubic meter. And we agree that that is a very unlikely scenario. That is, you can't -- a person -- from the literature that we've reviewed, you really can't have a -- persons in a room for eight hours with the dust loading of 200, 300, 400 milligram per cubic meter. You can't -- just from a respiratory distress point of view. So that was the first argument that was made, and we agree with that argument.

The second one that Jim pointed out and we

followed up and looked into was that in addition, if the person let's say was exposed to this acute exposure on June 1st or 2nd or 3rd as opposed to the 10th, that means on the next day -- you know, the -- let's say it was the 1st, then on the 2nd, the concentration of -- of uranium in urine would have been there. It wasn't measured, but it would have been there, would have been very high. Would have been above one milligram per liter. Now -- and Jim's point being that well, we don't see people very often getting above one milligram per liter, and when we do it's usually associated with highly soluble uranium -- you know, the UF4s and UF6s -- not -- not oxides. And we went into the literature -- you know, like you did -- and said yeah, that's true. I've got -- in fact, I've got a stack of papers here. I -- I got in touch with [Name Redacted] and I said [Name Redacted], what have you got, and he sent me some stuff and I said son of a gun, there you go.

So bottom line is, we accept those two lines of arguments why it really could not have been much earlier than June 10th.

But then there was a third reason, and to this day -- and to this day I don't understand it, and Dunstana and I have been looking at it -- and Dunstana's here because she's been doing some IMBA runs to try to come to grips with something, and I guess the -- those two reasons alone are probably enough to save the day, so to speak, in terms of supporting your position, but I'd very much like to get a better appreciation of what -- what NIOSH refers to as the curve-fitting issue. And I -- in -- in brief, the re-- if -- see, to me, if you have just one sample from a worker and you get a .08 mil-- milligrams per liter, and you don't have any more after that, you really don't know -- you know, I don't see where the curve-fitting comes in. And -- and with that -- and now maybe we sh-- and at that point I'll turn it over to Jim and then we'll get to the -- the other issue, the -- the incinerator issue a little bit later 'cause I'd like to air that out a little bit, although I don't think it's -- it is center -- is as center -- it is as center stage as it was before because your two other arguments are very compelling, but I'd

still like to go over it.

DR. NETON: Okay.

DR. MAKHIJANI: John -- John, before you turn -- I haven't talked to you for -- this is Arjun and I have not talked to you for several days, but I -- I have a question about our conclusion or the conclusion that you stated. The several hundred milligrams per cubic meter depends on the assumption that it's type S.

DR. MAURO: Yes.

DR. MAKHIJANI: Whereas if it is type M, the -- and we don't know which type it is because both assumptions are used in those calculations, so it isn't an actual idea of what was present in the air, and -- and actually the type M would be the more common used in dose reconstructions because it would be used for all -- essentially all -- or most organs other than lung or respiratory tract. So we're not actually talking about an assumption of several hundred milligrams per cubic meter. There's a range, depending on solubility. So -- so I don't think it is as physically implausible as you've stated it. So I -- I think the evidence is much more ambiguous.

DR. POSTON: I disagree with you, Arjun. You and I and others went to Chapman Valve and talked to the people. We had testimony from the people that the ro-- that the uranium came in in the form of rods --

DR. MAKHIJANI: Right.

DR. POSTON: -- that it was machined in the form of rods --

DR. MAKHIJANI: Right.

DR. POSTON: -- that it exited in the form of rods, and I find it a little difficult to say that all of a sudden it's going to go into some other kind of class.

DR. NETON: I think particularly if there's a fire.

DR. MAKHIJANI: No -- no, the -- I --

DR. POSTON: I don't think there's much basis for what you said.

DR. MAKHIJANI: No, I -- I didn't say that it came in the form other than rods and went out in the form of rods. I'm saying that when there is a fire, there's normally a mixture of solubilities. It won't be type F, certainly, but it could very well be a mixture of type M and type S. If you look -- if you try to fit

the air concen-- or compare the air concentration data at Fernald with bioassay data, and there is plenty of both for uranium, you actually don't come up with a uniform -- with a uniform idea that somehow there is type S in the metal area at Fernald. On the contrary, there seem to be quite a lot of type M or in the old, you know, class W and class Y mixtures at Fernald --

DR. NETON: Well --

DR. MAKHIJANI: -- so I -- I think that -- that there isn't a -- a clear measurement that when you have fires it's always all type S. I don't agree with that -- with that implication of what you said.

DR. NETON: Well, I think I can -- I might be able to clear something up because that might become less relevant if I can try to explain our position on -- on this issue. We've been talking past each other, I think, and I hope that today we can get this resolved.

DR. MAURO: But before you do that, I -- I guess I -- I have been operating on the premise that it's a fire. If it's a fire, it's got to be an oxide --

DR. NETON: I would say that --
DR. MAURO: -- always an oxide is an S.
DR. NETON: Arjun's --
DR. MAURO: But that's not correct, you know --
DR. NETON: Arjun -- Arjun has some -- some merit in his argument, but I think the overwhelming majority of this material would be insoluble material in a fire, and I -- I've done this at Fernald where we've taken air samples of oxides in the plant. We published an article in *Health Physics* several years back where it was -- my recollection is 90 percent type -- it would have been type class Y at that point. Any time you're dealing with uranium oxidized surface -- surfaces, it's -- it's more insoluble than -- than M, so the overwhelming majority would be an insoluble form, in my opinion.
But -- but he has -- it may -- let me explain to you what we're doing here and this may make that argument unnecessary.
The first thing I -- I think we've mentioned this before is that the chronic exposure model where we modeled in the acute fire is only applied to people who were not sampled as part

of the fire. In other words, we're assuming -- this will apply to all workers except the fire workers. So if a person has a sam-- a urine sample from the fire, one of those seven samples, we would model that as an acute exposure and give them the highest intake that would result -- plausibly result from that bioassay sample. In other words, we -- we could go back to June 1st. That's not precluded. And if you read closely, the site profile says that.

DR. MAKHIJANI: Okay.

DR. NETON: So you know, if you have seven people who were exposed in a fire, and we believe those were the people that were working the cleanup of the fire -- we don't think they were actually fighting it, they were cleaning it up -- you can go back to June 1st and give them an exposure.

What we're trying to cover with this chronic model is a situation where a person is working on the line, machining and such, and happened to be involved in the fire, we didn't know it, so he got a chronic exposure model with an acute exposure scenario thrown on top of it.

DR. MAURO: Uh-huh.

DR. NETON: And when you model it that way, the highest overall intake for the worker is a result of the chronic model with an intake on June 10th.

DR. MAURO: Uh-huh.

DR. NETON: Because as you move that acute intake further and further back, it lowers the chronic exposure model to such a degree that the overall intake is smaller. And that's -- that's the whole point of our analysis.

So you really have two scenarios here. You have one -- okay, I'm a fire fighter, I could have been exposed, you would model that as an acute intake and give them credit to go back to June 1st.

DR. MAURO: Not -- not a problem, 'cause we have a bioassay point.

DR. NETON: We -- we would use a default model. A default model is for people who we have no bioassay from the June fire, and we also believe were line workers who were chronically exposed. And that's where this best fit comes in. The best fit constrains you to use the .03 values at -- I've forgotten how many points

now. We've assumed that there were -- Cindy, help me out here. How many bioassay points did we model, three?

MR. ROLFES: Four.

DR. NETON: Four? Thanks, Mark.

MS. BLOOM: Four, yeah.

DR. NETON: So there were four bioassay points. We assumed that for each of those sampling points, the highest measured value of all those four urine samples was -- was measured. So you've given everybody .03 --

DR. MAURO: Right.

DR. NETON: -- and so if you're excreting continuously .03 milligrams per cubic meter, and you superimpose this spike on top of it --

DR. MAURO: Uh-huh.

DR. NETON: -- and I think Dunstana's last report agreed with that, that the best fit model for that scenario is June 10th. It gives them the highest overall --

MR. GRIFFON: Hey, Jim --

DR. NETON: Yeah.

MR. GRIFFON: -- this is Mark Griffon. I -- I have no problem with that approach in general. I even stated that at the last meeting. I'm

looking at the IMBA runs now, though, and the one thing -- as we're discussing M and S, the one thing I'm not sure of is I would have probably modeled the acute as an -- more of an S anyway and the chronic as an M, and it looks like it's not done that way in these models. Is that -- am I incorrect on that? I'm just glancing at these now, so --

MS. BLOOM: These were both modeled as type S based on the fact that that was what the concern was in the SC&A report, but you could certainly do it for type M and you'd come out with a similar fit.

The other thing is that of the 40 bioassay results, that represents the highest result from the fire and the highest result from -- from the workplace, and most results were much lower than that.

MR. GRIFFON: Right, right, right, no, I --

MS. BLOOM: So I think that, you know --

MR. GRIFFON: I understand that, but I don't see a mix of solubi-- I was thinking, you know, of the chronic one as a type M and the -- and the acute spike would be a type S, and I don't even know how to do that in IMBA, quite

frankly. I -- but, you know --
MS. BLOOM: You can actually separate --
MR. ROLFES: You can certainly do that.
MS. BLOOM: -- the models in there, there --
MR. GRIFFON: Okay.
MS. BLOOM: -- are ways to do it, but --
MR. GRIFFON: Yeah.
MS. BLOOM: -- I --
MR. ROLFES: But we're choosing the -- the solubility class that results in the highest dose to the organ of interest, so --
MS. BLOOM: Right.
MR. ROLFES: -- if we were choosing two separate solubilities, that wouldn't necessarily be claimant favorable.
MR. GRIFFON: I -- I -- I'm looking at the way the data fits, though, if you're talking about how this -- the -- anyway, yeah, okay.
DR. NETON: I understand what you're saying, Mark, and --
MR. GRIFFON: Yeah.
DR. NETON: -- we can certainly --
MR. GRIFFON: I understand. I'm not sure it's going to make any difference, I was just curious, the way it was modeled here. You

know, if you're talking about best fit and you're -- and you're saying that likely the fire is supposed to result in more type S material --

DR. NETON: Yeah.

MR. GRIFFON: -- then arguably the acute spike should have been modeled as a type S. That's all I'm saying.

MS. BLOOM: And the acutes are -- but I -- but I think what we're looking at is claimant-favorable models of -- of type M or type S that result in the highest dose to the worker.

MR. GRIFFON: Yeah, I -- I agree with wi-- that the --

MS. BLOOM: And so I don't think that we're -- this isn't really looking at best fit. If I was going to do a dose --

MR. GRIFFON: Right.

MS. BLOOM: -- reconstruction in modern day, I would use the date that gave me the -- I -- that -- that the information indicated was the best answer.

MR. GRIFFON: Yeah.

MS. BLOOM: I wouldn't try to be giving the largest dose. Because our program's a little

bit different, my goal is to give the -- the largest dose within the realm of possi-- of reasonable possibilities.

MR. GRIFFON: And you're --

MS. BLOOM: And so -- so there's a number of ways that are reasonable to fit the data.

MR. GRIFFON: Okay. But you looked at that com -- all I'm asking is did you look at that combination idea --

MS. BLOOM: Did I --

MR. GRIFFON: -- 'cause I don't see that as one of the --

MS. BLOOM: -- combine type M and type S --

MR. GRIFFON: Yeah.

MS. BLOOM: -- to see if I could get even larger doses?

MR. GRIFFON: Right, larger -- would that have resulted in a larger dose, you know --

MS. BLOOM: I did not do that.

MR. GRIFFON: -- 'cause I could see it would affect the intake, but then you're running an S for the dose as well so that would be lower doses and --

MS. BLOOM: Yeah, I don't --

MR. GRIFFON: -- you didn't do that? I'm --

MS. BLOOM: -- I don't believe --
MR. GRIFFON: -- just curious 'cause that would definitely change things. I'm not sure it would be -- this might be the most claimant favorable --
MS. BLOOM: Yeah, I don't believe that --
MR. GRIFFON: -- and I agree with your approach in general. I'm not -- I'm not arguing the approach.
MS. BLOOM: Yeah, Mark, I don't believe it would because when you model the type S as an acute intake, you're going to be taking -- you're go-- your predicted urine is going to be -- well, it'll be a little bit lower, I guess, from the type M --
MR. GRIFFON: Yeah, yeah.
MS. BLOOM: -- it might be a little bit higher, but --
DR. NETON: It's -- it's not intuitive right now to me as to which way it would go.
MR. GRIFFON: Yeah, not intuitive to me, ei--
DR. NETON: 'Cause you would -- you would have a larger intake of type S for sure, based on the -- this -- the .08 -- eight microgram sample, but then the dose delivered to the

metabolic organs --

MR. GRIFFON: Exactly, the dose will be lower. Right? Yeah, right.

DR. NETON: -- will be lower and I don't -- I'm not exactly sure how those -- those would off-set.

MR. GRIFFON: Right, right.

DR. NETON: It may end up being about the same, I don't know, but I -- I think we can certainly look at that. I mean if that's something that, you know, is -- is a -- recommended for us to do, I guess --

MR. GRIFFON: Yeah, and -- and again, I don't think that takes away from the overall appro-- I agree with the --

DR. NETON: Right.

MR. GRIFFON: -- nature of your approach, so...

DR. NETON: I guess that's what I'm thinking is that that doesn't invalidate our approach and --

MR. GRIFFON: No.

DR. NETON: -- does that all of a sudden make it an SEC issue. I think not, but --

DR. POSTON: Yeah, I just want to make sure that we're all -- that I understand what's

going on, Mark. This is not a showstopper in terms of us moving on. This is just a curiosity?

MR. GRIFFON: Well, it -- it's not -- yeah, I just want to -- you know, if -- if the argument is that you're trying to generate the most claimant-favorable doses from what I would argue is fairly minimal urinalysis data, then I think we'd better check this and make sure that this -- you know, it seems like this is probably the most claimant-favorable approach, but you might want to check that combined solubility question and -- and make sure, but not a showstopper, no.

DR. POSTON: Okay. Thank you.

DR. MAKHIJANI: This is Arjun. I think you'd also get a better fit for type M for an earlier -- for an earlier assumption of a date for the fire rather than for type S.

MS. BLOOM: You don't.

DR. MAKHIJANI: You don't? Oh, you checked that?

MS. BLOOM: No, I looked at the chi squared values, I looked -- and you know, it -- it's not a huge difference in this, but you don't.

DR. MAKHIJANI: Okay. Thank you.
MS. WU: This is Portia Wu from Senator Kennedy's office. Would it be all right if I asked a couple of questions in here at this point?
DR. WADE: Surely.
MS. WU: And I -- I apologize, I actually need to leave at 11:00 to brief the Senator so I wanted to get these points in now.
You know, just as a lay person, obviously, I -- I don't understand some of these -- these rationales, and particularly on the -- you know, sort of the three justifications, it sort of seemed like well, the first two were -- were deemed dis-positive because you were saying well, it's very unlikely that people would have really high exposures, we just don't see that. And you know, just because something happens infrequently doesn't mean that it couldn't have happened here, and so I don't quite understand why, you know, there -- it must be the case that the fire was June 10th and it couldn't have been -- not June 1st because those values would have been off the charts, why couldn't it have been June 5th or June 6th.

Knowing how a lot of workplaces work often, you -- you know, you say okay, then these people need to be sampled, but it doesn't always happen immediately, the next day. When that --

MS. BLOOM: We're not saying that the fire couldn't have happened a different date. This is the coworker model. This is not the model that you would necessarily choose for the individual.

MS. WU: Okay. Well, that's what -- another question I had is I -- I sort of got confused when we seemed to shift from one on the acute exposures to the -- to the more -- more general one, so I -- I wasn't -- it did seem to me, though, that you -- it was being resolved that it was unlikely that the fire was on an earlier date. Is that not true?

MS. BLOOM: I actually believe that we've seen a new reference that indicates that the fire might have occurred earlier.

DR. NETON: It could have been at the very end of May. This is Jim Neton, Portia. I apologize, maybe I -- I caused the confusion here.

MS. WU: Yeah.

DR. NETON: But it -- it is our position -- I think that's been the source of some confusion between --

MS. WU: Yeah.

DR. NETON: -- NIOSH and SC&A that we could go back earlier, we will go back earlier if we know the person was a fire -- involved in cleaning up or fighting the fire, and assign the most favorable date we -- we can find.

MS. WU: Uh-huh.

DR. NETON: But when it comes to someone who was -- was -- was working on the lines, you know, machining, we have routine bioassay samples. We would use those and assume they were chronically exposed, then also give them credit for having participated in the cleanup of the fire. Since you have this chronic bioassay sample data, it makes a little different scenario as to what their intake would have been from the fire.

MS. WU: And -- and why is it that these other people would not also have some level of acute exposure? I mean if they were around, even if they weren't fighting the fire.

MS. BLOOM: We've used the largest bioassays to

account for -- for all the exposures, but it's obvious that most of the bioassays are less then ten micrograms per liter -- I think 35 of them are ten or less. We're using 30s and 80s to derive this coworker model, so I think we've been very generous already in assigning intakes.

The other thing is that it's pretty clear that the operational period was probably a little bit shorter than we've assumed, and probably on the order of a factor of two shorter than we've assumed in the site profile, although there's -- there's no black and white evidence, it's only in dark grays and light grays.

MS. WU: Uh-huh.

MS. BLOOM: So -- so we're giving the benefit of the doubt to the claimant, and by the time you add up all these benefits of the doubts, it becomes a very generous model to assign intakes with.

MS. WU: I -- I understand that and I recognize that, you know, there are -- there are a lot of vagaries and one has to make the best assumptions possible.

If you wouldn't mind if I asked one or two

questions about the other pieces that were raised, one is this sort of -- the enriched versus -- versus not uranium, and I know that -- that you -- you said that it seemed like you were satisfied that basically the enriched uranium was not from work in the contract period. I just know that, you know, there were -- I was trying to figure out what has been done to track down where that probably came from? I don't know if that's NIOSH's responsibility, not SC&A's, but I just want -- was hoping someone could flesh out a little bit more because I know people have been looking into this, you know, what sources were looked through, what documents were retrieved, what -- you know, if people talked to the people who did the cleanup as -- as well as everything else, so...

DR. POSTON: I think Jim has an answer.

DR. NETON: Portia, this is Jim Neton. There's two things that we've done. One is -- I don't remember if you were on the call the last working group meeting, but we --

MS. WU: I had to jump off. I was on for the first part.

DR. NETON: Okay, the fir-- one of the first pieces was that it -- the covered exposure period is defined by Department of Labor in conjunction with Department of Energy. We -- NIOSH does not make that determination as to what the covered period -- time period is. And we agreed at that last working group meeting to send a letter to Department of Energy and the Department of Labor to inform them of our -- of the discussion that we had with workers at -- you know, during our worker outreach meetings at Chapman Valve, that there appears to have been some other activities that may have resulted in this enriched contamination. That letter was written by Larry Elliott to Pat Worthington of the DOE and Mr. Pete Turcic of Department of Labor on March 1st of this year, and we sent it to them asking them -- that -- you know, providing them this information, asking them to re-evaluate the covered period in light of these -- these -- this information. The second piece, and Mark Rolfes, sitting to my left here, is prepared to talk about what we've done internally to try to track down some information.

MS. WU: What was your response? What was the response you got from the first one?
DR. NETON: I'm not aware that we've had any --
MR. ELLIOTT: They're meeting -- this is Larry Elliott. They're -- they're meeting at DOL today. We have an OCAS representative at the meeting where they'll be discussing the covered period for this facility and several others, and we await the outcome of that discussion today.
MS. WU: Thanks, that's helpful. Now, I'm sorry, the second piece you mentioned?
MR. ROLFES: Yes, Portia, this is Mark Rolfes from NIOSH, and we've on several occasions sent correspondence to Bechtel National's legal department requesting information during the remediation time period in the '90s, and we were also requesting other pieces of information such as dosimetry records and laboratory analyses and such. And we are awaiting a response from Bechtel National's legal department at this time.
DR. NETON: Okay. We've also gone back to ORAU, who is our main contractor on this program, and actually generated these results -

- a different part of their program -- to try to pull out the -- any available records that would give us a hint as to what these samples represented, and there's nothing that they could track down that would help us flesh out this issue any better. That's where we're at in our own internal review.

MR. ROLFES: We've -- we've tried to put together as many pieces of information to -- to -- we -- we've evaluated this in quite a bit of detail to look to see if there was any possibility of enriched uranium being on-site.

MS. WU: Right.

MR. ROLFES: However, it's really this only -- only the single sample that we found that indicates that it could have been 2.16 percent enriched uranium. Because given the design of the Brookhaven National Laboratory's graphite pile, everything supports that it was run on natural uranium during the time period that Chapman Valve produced -- I'm sorry. It was -- it was running on natural uranium in the early '40s. At a later date, in the late '50s, it was switched to an enriched uranium. However, there's no indication that that enriched

uranium was produced by Chapman Valve, so...

DR. MAKHIJANI: Mark, this is Arjun. There were two -- in SC&A's report we argued that there were two samples indicating enriched uranium, one with a 2.16, but the other was called consistent with natural uranium. We don't believe it's consistent with natural uranium, so I think that that is a point on which we do have a disagreement.

DR. NETON: Right, Arjun, but at the same time I don't think either of us (unintelligible) --

DR. MAKHIJANI: No, it's just -- just a point of clarification.

DR. NETON: Okay.

DR. MAKHIJANI: I think -- I think it -- NIOSH consistently said that there was only one sample when there's actually -- I -- I believe that NIOSH's own publication off the sampling results indicate there were two enriched uranium samples. I mean we've -- we've -- so I -- I think, just in the interest of accuracy of the record, there should be something said about that.

DR. NETON: Well, we don't know that it's enriched, either. I think there's some debate

about that. If this --

DR. MAKHIJANI: That's what the sample indicates in what SC&A has written, and I'm just reiterating that position in order to say that there's not an agreement about it.

DR. NETON: Right. We did try to go back and get the original analytical datasheets for this because we don't know whether this was alpha spectroscopy or some geranium -- germanium or sodium iodide measurement and, you know, the uncertainty of that -- we don't know what the overall uncertainty of that measurement is. And it certainly could be considered natural uranium if the uncertainty's fairly large.

MR. GRIFFON: And Mark, this is Mark Griffon, I just wanted to -- did -- did you say you were waiting a response from -- from Bechtel?

MR. ROLFES: Yes, that's correct.

MR. GRIFFON: Okay, okay. So you don't have anything either way. Did you contact, by any chance, Envirocare?

MR. ROLFES: No, we have not.

MR. GRIFFON: The waste was shipped there and I was curious -- you know, it was only ten years ago. They may have a record of the volume

shipped and the enrichment levels on the manifesting, which may be of interest here, and I don't think that'd be that difficult to run down, but --

DR. NETON: Again, I guess I -- I'd point out -- I mean I -- that's something that we can track down, but --

MR. GRIFFON: Yeah.

DR. NETON: -- I think we -- we were in agreement, at least last time, that the covered period as defined by Department of Labor I think is -- represents natural uranium exposure. These other pieces, if they (unintelligible) --

MR. GRIFFON: The other pieces will be considered separately? Is that --

DR. NETON: -- considered -- yeah, considered in --

MR. GRIFFON: Okay.

DR. NETON: -- a separate evaluation.

MR. GRIFFON: Okay, okay.

DR. WADE: Portia, you had another point?

MS. WU: Yes, and it's -- and I appreciate and -- and thank you for the work that you've done thus far to try to get to the bottom of this

enriched uranium thing. I think that is something we're going to be interested to keep following and we'll follow up with DOL and -- about what -- their discussions.

But the final point which, you know, we've raised exhaustively in our member letters has been this kind of disconnect with the -- some of the external sampling and the -- and the urine samples, and we remain concerned that, you know, we don't have actual bioassay data for some of the people who might have been the highest exposed. I know that you have all said that well, we're making a lot of other assumptions about people's exposure and therefore we can, you think, make very claimant-favorable estimates, but just so you know that that continues to be a source of concern for us and for our constituents, that that -- you know, that's a gap there that shows maybe you really can't accura-- estimate these things accurately. So -- so those are sort of our main concerns. I'll obviously continue to listen in on the discussion, but I appreciate everyone's taking the time to hear our concerns, and I know that Senator Kerry and the

delegation has raised these with you as well.

DR. WADE: Thank you. We appreciate your being with us.

DR. MAURO: Jim, there was one aspect to this that we really haven't talked about yet, and that has to do with perhaps more than one fire. I think that the -- I think that this issue of the date of the fire I now understand. But then there was some feed-- well, there's literature that says that fires are fairly commonplace in these types of facilities, and -- and -- and I know that Dunstana has made a few runs just to see is it possible that could have had -- because they were separated out in time -- these four samples were separated out, and I guess it was Aug-- there were several months in between each sampling period, these four sampling periods, and in theory there could have been a number of spikes and then go-- go away and you would not have picked them up in the next sample round, so -- and then -- so one of the questions we raised, and when we met with the representatives, was were there any other fires. And the answer we received from the folks we talked to was they don't recall

any, but as Arjun has correctly pointed out, you know, these weren't people that were there all the time and would have -- and also the evidence seems to be that the only large fire that was memorable was the one that occurred in June of '48, early June '48. But we did raise this question regarding, you know, there could have been other fires that could have sneaked in, delivered a high intake and then the activity in the urine would have gone away and you would not have picked it up in the next sampling.

DR. NETON: I disagree.

DR. MAURO: Okay.

DR. NETON: It might not be above the detection limit, but it would certainly add to the baseline --

DR. MAURO: Uh-huh.

DR. NETON: -- of what's coming out. I mean you're going to have something there. And I would agree that it would not maybe be above .010 detection limit, but you -- this happens all the time. You can -- you'll get some baseline there and it might be .03, and that will be added to the chronic exposure itself,

so I don't --

MR. ROLFES: Sure, any --

DR. MELO: Yeah, but actually the contribution of acute intake after certain while is -- is nothing compared to the --

MS. BLOOM: Could you speak up, please?

MR. GRIFFON: We can't hear you.

DR. MELO: Sorry. The cont-- the contribution of the urine -- the contribution of acute intake in urine after certain while is mainly for type S is --

MR. GRIFFON: Excuse me, John?

DR. MAURO: Yeah.

MR. GRIFFON: Whoever's speaking, we -- on the phone we're not hearing very well at all. It's very low.

DR. WADE: Hold on a second, we're going to make an adjustment.

MR. GRIFFON: Okay, thank you.

(Pause)

DR. MELO: So thank you. So this is Dunstana Melo speaking. My point is, the contribution of acute intake in urine samples after certain while, especially for type S compound -- so this contribution is very small and -- compared

to the -- the contribution of chronic intake, so if you have -- and my point is on that time, in '48 -- in the '48 years, the -- the uncertainty on the measurements, on urine measurements -- urine -- measuring in urine samples were very large. We can -- we can believe in that. And also to use this IMBA code to -- to -- to be -- to design a model of -- of exposure, you need -- well, you need several measurements in order to have a reliable model or matrix of exposure. And I was looking at the files that you sent to us and so you are using a linear distribution and actually when you have a large uncertainty you need to use the lognormal distribution. And also you -- you are using a scattering factor equal to one, and actually you have a large uncertainty in the measurements and you are dealing with measurements of different people, and so the -- the recommendation -- the ICRP recommendation and all the recommendation for use of IMBA in these situations when you don't have the measurements of ju-- of one pers-- one -- all the measurements from one worker and also -- and we don't have the -- the 24 hours

excretion and -- well, all the uncertainties related to the -- to the analysis and sample preparation and sample measurement and the enter -- and enter the individual variations, you need to use a scattering factor equal to two, so --

DR. NETON: Well, let me stop you there real quick 'cause I think -- I agree with you if we were doing an individual dose reconstruction for a person exposed at a plant and we had their bioassay data. We would need multiple samples, we'd have to take all this into consideration. But in dose reconstruction it's a little different. We took, of the 40 samples, the highest sample recorded in all the people and used that, and I think that represents -- it's clear in my mind -- bounding value.

DR. POSTON: You applied that to every --

DR. NETON: We applied that to everyone. So -- so this is a much different application of a dose assessment than you would have if you were doing an individual dose reconstruction at a plant and he had exposure. Sure, you'd take two, three, four, five (unintelligible) samples

and look at the variability in the scatter. When you take the highest sample ever recorded on the 40 and -- and most of them -- I think there were only three or four above detection limit, of the 40. We took the highest one of .03 and applied it to every person and came up with a 70 MAC -- 70 times the Maximum Allowable Air Concentration product model, and then it -- and we'll get into this later. If you start comparing that to what is really experienced in machining operations at DOE facilities, I think -- we think that's a fairly reasonable approximation and assumption that we've applied. So what you're saying is very -- is valid for individual dose reconstructions. We try to get the exact number for a person. That's not what we've done here.

DR. MELO: Yeah, I know, but why -- sorry. Why you didn't use the scattering factor equal to two if -- since we have a large uncertainty?

DR. NETON: Well, we took the highest value --

DR. MELO: I understand -- I understand that -- that it's for non-- non-monitored workers, but even though, it's a large uncertainty in this matrix (unintelligible).

DR. NETON: I understand, but we didn't even take the 95th percentile, we just took the highest sample, so it's a bounding analysis is what we would call that. And if you start putting scattering factors on top of -- of the highest value and such, you get -- I think you put yourself into a -- an unreasonable estimate.

DR. POSTON: You get the opposite question: Why did you use the two?

DR. MAURO: What -- when I think about this and I say okay, what I'm hearing is -- or yeah, maybe there were -- in fact, there's no doubt it was assorted, the types of exposure. You know, no one was exposed in a flat line. So what are you -- but if you integrate -- let's -- let's put aside now the -- the fire, the single fire, that's taken care of. What I'm hearing you're saying, and I think this is really where the judgment comes in -- it's a judgment call -- you take the integrated exposure, total number of atoms -- you know, of becquerels inhaled over that year and a half, you get -- you get a number, they're not -- it's in the reports, you get a number. Now

you're saying that listen, we're going to assign that number, that intake, to everybody. Now -- and -- and you're saying that -- and that's -- that's assuming that for that one person out of 30 that got the .03, it back-calculates -- that -- that's the chronic intake, so you -- in effect, what you're saying is that even if there were these occasional spikes, if you were to -- you know, the integrated exposure is still not in real-- in other words, you don't really expect that the integrated exposure for anyone is going to be greater than that integrated exposure. That's notwithstanding the fact that there might have been some other fires.

DR. NETON: Yeah, we're not saying that everybody was exposed to 70 MAC the whole time.

DR. MAURO: Yeah.

DR. NETON: We're saying that -- essentially it's a time-weighted average, if you want to look at it that way.

DR. MAURO: Yeah, in fact, I'd prefer thinking in terms of we're going to assign to everyone a certain number of becquerels inhaled over that year and a half period and give it to

everybody. We don't know how they got it. We don't know if they got it like this -- you know, everyone got it the way they got it. But you're saying the weight of the evidence and looking at the literature, looking at the operation, looking at the bioassay data is that by giving everyone that -- even if there were intermittent small -- small fires, it -- it's not going to result in a time-integrated intake over the course of that year and a half greater than that -- and this is a judgment call.

DR. NETON: Right.

DR. MAURO: This is a place where all the people sitting around the table, all the folks involved have to feel about yeah, we're doing the right thing by these workers by making that assignment 'cause I don't think there's a definitive answer to this except the weight of the evidence and the judgment of the scientists that looked at it. And I guess, you know, when I talked to Dunstana, I guess from the last e-mail I received -- is it your sense that that intake -- that time-integrated intake is in fact an estimate that would prop-- that would cover some individual spikes that may have

occurred all along the way? Other words, there's enough conservatism built into that that if there were some additional small fires that may have gone unnoticed and unrecorded, that there's enough I guess excess in the chronic that would accommodate those occasional spikes. And I think that's the heart of the matter here.

DR. NETON: Yeah, well -- well, let Dunstana answer first I guess.

DR. MELO: Yeah, I think that's -- it's -- it's -- yeah, it's a puzzle for us because if -- if we -- if there is some -- if there are some additional fires, additional intakes, I think it would be very hard to -- to be reflect in those urine samples, urine measurements.

DR. NETON: I disagree. I think -- chronic -- chronic exposure is nothing but a series of intermittent acute exposures, you know, and the more intermittent exposures you have, the better approximation the chronic model is.

DR. MAURO: Uh-huh.

DR. NETON: Now if you're saying --

DR. MELO: Yeah, I a-- I ag--

DR. NETON: -- you've shown that for one is

okay --

DR. MELO: -- I ag-- I agree with you, because I think you are very -- in this matrix, the chronic intake is very conservative, and if you have some small acute intakes -- well, actually the chronic intake takes into account small acute --

DR. NETON: Yeah.

DR. MELO: -- everyday small acute intakes, but small acute intakes. I'm not sure about fires and large intakes. I think that the number of measurements are not enough for us to -- to -- to be so confident to say that these acute intakes didn't occur and that was my point, to -- to design that -- that route to simulate those acute intakes since the -- in the SEC petition the petitioners were saying that during the operation of Chapman Valve there are some additional acute intakes, so that was the reason, just to show that it would not be reflect in the urine measurements. It was not the -- I --

DR. NETON: Did you -- did you model it, though, with the chronic exp-- on top of the -- I agree with you that the amount coming out in

the urine is going to be small, and -- and actually even below the detection limit. I'll agree with that. But what you're going to have to do is -- is at some point suppress the chronic intake for the -- that small incremental value, and then when you multiply that times 20 years, you -- you're going to -- you're going to -- that small suppression of chronic intake will result in a -- in a fairly large reduction in intake if you assume it happened over a long period of time. You know what I -- understand what I'm saying, is a very small reduction in a chronic intake will result in a very large -- could result in a very large reduction in overall intake because you have to -- and have mass balance. You can't inhale two sources of intake and then have the chronic model still being the same. It has to go down. Unless you've done that calculation, I haven't seen that result. I mean I -- I understand what you're saying, but if you -- those calculations, I would suspect that you're going to end up at the same point. You can only excrete so much out in the urine from those intakes, and -- and (unintelligible) --

MR. ROLFES: Any previous intakes are going to contribute to future uranium excretion, so what we're doing is what -- what NIOSH is assigning results in the highest internal dose that we can interpret from these bioassay data. We're assuming that a person is chronically exposed for 16 -- I can't remember off the top of my head -- 16 months. Rather than to try to do a best estimate of someone's dose, we're assigning a more claimant-favorable dose by assuming that they were in fact chronically exposed for several months rather than evaluating two separate acute intakes.

Now if we were trying to do a best estimate, I would agree with your concern. But we're not trying to do a best estimate. When we would do a best estimate, that would result in a lower internal dose. We're assigning a claimant-favorable internal dose that is much higher, so...

DR. POSTON: I -- this -- this is all very interesting from a scientific standpoint. I could sit here and listen to all this all day. But I guess the question is, and you said it in your report, is -- is what NIOSH has done

claimant favorable, and it seems to me that's the answer -- the question that needs to be answered. In your report, regardless of your criticism of what was done, that was your -- your -- your answer. As far as I know, John has the same answer. So we can argue about or discuss how one would do these reconstructions on an individual basis or a group basis or so forth, but maybe I'm the one who's off base, but it seems to me that the question that needs to be answered, is what NIOSH is doing claimant favorable, and if the answer is yes I think we should move on.

MR. GRIFFON: Well, I -- actually this -- this discussion's given me some deja vu. Jim -- Jim, we've done this before.

DR. NETON: Yes.

MR. GRIFFON: And I think I'm fine with the model approach. The only question I have wi-- with Chapman here, and I raised it at the last meeting, was -- it's more of a -- a question of are -- do you have enough sampling information to be confident, and I think, you know, possibly with the other references that you're going to discuss --

DR. NETON: Right.
MR. GRIFFON: -- on top of -- on top if this urine data, then I think we can be convinced.
DR. NETON: Right, that was a --
MR. GRIFFON: But right now, I mean you're -- you're hanging your hat on -- I -- I know you took the highest values, but they're -- they are from different people and in fact, if I look at the data right, there were only three machinists that were ever sampled and I -- and I do think they have low samples, but nonetheless --
DR. NETON: To tell you the truth, Mark, if you look through the -- the log-in entry sheets, I don't know how many more machinists there were. Looking at this (unintelligible) --
MR. GRIFFON: Yeah, there -- there weren't a lot of pe-- I -- I agree, there's not a lot -- if you look at the log sheets -- the external log sheets, anyway -- I -- I didn't see --
DR. NETON: Well, if you look at the log sheets -- the external log sheets that have job descriptions --
MR. GRIFFON: Right.
DR. NETON: -- I'd be hard-pressed to find more

than a couple more machinists.

DR. POSTON: Mark and other members of the workgroup --

MR. GRIFFON: Yeah.

DR. POSTON: -- would -- is there objection to moving on and having -- listening to what Jim has to say about his evaluation?

MR. GRIFFON: Yeah, I mean if you -- I just wanted to put that -- that question on the table, the representativeness. The model I think I'm -- I'm -- I'm satisfied with if -- if SC&A is. I'm --

DR. POSTON: Well, unless there's objection, then I'd like to move on and have Jim --

MR. GRIFFON: You can --

DR. POSTON: -- review his report. Do I hear any objections?

(No responses)

Jim? Okay.

DR. NETON: I -- I understand what Mark is saying and I agree with that, and that was the whole point of this next phase, which was okay, we have a model built on 40 bioassay samples and if we look -- this is sort of backwards of how you normally do this, is you have air

sample data, then com-- you bioassay and use that as the gold standard. We've taken bioassay and developed a model and now we're saying does this model pass the reasonableness test in terms of what happens at uranium machining facilities in general, because there are only so many processes that can happen when you work with uranium metal.

We know that at Chapman Valve they worked with four-inch-long by one-inch-diameter slugs. That's what they worked with. They did a lot of it, thousands of these, but they machined them. They -- they came in and they put slots in -- drove little buttonholes and that sort of thing. So what's -- and Cindy Bloom has put this together, and I apologize for the late delivery, but there's a lot of information in here and it took some time to put together.

So what we have here in -- in this report, and I'm sure most people haven't had a chance to read it, is a summary of what could be gleaned from the literature that we have in our site research database. And it summarizes air concentration data, for the most part, and some bioassay data for 14 Atomic Weapons Employer

facilities, if you count Chapman Valve, and six DOE facilities where machining of uranium occurred. There's a lot of data here. I don't want to go through all of it. I'll -- I'll kick it off and then maybe Cindy can chime in -- and Mark, as well -- as to their opinions of this. But I've reviewed this and I -- I think -- a -- a few key things to look at are the Chapman -- I mean the NUMEC analysis that was done -- it's an expansion of what was in the original site profile, that starts on page 6 of this document -- where there was a NUMEC incinerator. It was in the '60s time frame. And this data -- Cindy, was this data provided to us at the Chapman Valve worker outreach meeting? I believe it was.

MS. BLOOM: It was.

DR. NETON: That's right, so this was provided to us by workers or some former workers from Chapman Valve who -- at least in their mind, I think -- thought that this would be representative or reasonable to use as a comparison to what might have happened at the furnace at Chapman Valve. And there's no doubt that roasting of uranium occurred, and this was

a similar operation here at Chapman. And I think there -- there are bioassay samples as well as air samples on page 7, and the incinerator operators' urinalyses ranged from 37 to 68 micrograms for normal uranium, which is in the same ball park as what we look-- what we look-- we used for Chapman Valve. And in addition, the Breathing Zone samples that were collected, as you see in this table from -- in the 1966-'67 time frame, the average values are not that out of line or somewhat consistent with the value of 5,000 dpm per cubic meters that we would assign for type S for Chapman Valve, remembering that what we are assigning is a time-weighted average, essentially, exposure. But we don't -- we -- we don't -- we would expect that there would be excursions where changing the incinerator glovebox filters, for example, is 15,000 dpm per cubic meter here. Okay, but how oft-- how long does that operation occur and how long does it exist and that sort of thing.

DR. POSTON: Are we focusing on the last column on the right? Is that where --

DR. NETON: The second column in on the right

would be the 14,798 -- I'm just pointing out that there are excursions above what we would assign on a time-weighted average basis, but the trick here then is to figure out what the duty factor is and how often did someone -- how long did it take to change a filter and -- and that sort of thing. These values are not out of line with what we are using in our model -- this is what I'm saying -- we based that on bioassay samples.

The next one that I would point to is the one that John Mauro brought up. That's the -- I'm starting on page 10, I think, is the famous -- now-famous Adley document. It was the Hanford operations where they -- they did a lot of processing of uranium in the remelt -- what they called the remelt facility.

Cindy has done a good job summarizing the data on page 12, and here we see almost all the samples are consistent with -- with our operations, except when you get down into the oxide burning area about two-thirds of the way down you see some fairly high excursions in terms of microgram per cubic meter. Now those values are larger than the 5,000 -- let's see,

we would assign -- 3,300 would be our assignment. So if you look at the 98,600 value -- you know, it's roughly 30 times what we would -- we would assign. However, again, this is a -- this is the high end value we defined, and this is shoveling oxides that is still red-hot. And again, how long would that occur. I would argue that, you know, this is where -- this is where some judgment comes into play. How long did a person actually shovel this -- per week. And if we can assume a one-hour per week shoveling period, then that comes right in line with what we would use for our time-weighted average exposure.

None of these are hard and fast. Again, you know, we don't have a time-weighted average amount that Chapman Valve has said that they shoveled. Now one thing to keep in mind is that these operations produced much more uranium than Chapman Valve, as far as the source term -- much larger source term. If you look at the Chapman Valve source term -- you see these calculated later in this document -- we actually know -- we can actually -- based on the lo-- the loading of these slugs into the

Brookhaven reactor, it -- it appears that something around 56 tons of uranium were actually processed at Chapman Valve.

Now that sounds like a lot of uranium. The reality is, that would fit into about 60 drums. You know, a drum -- a drum of UL3 will hold about a ton of uranium, at least in my experience. Now this is metal, so there's nothing -- but it's not -- you know, it's not massive quantities of uranium like were processed at Fernald or at this Hanford facility, so the source term is much smaller, meaning that the number of turnings and roasting operations will have been more limited. But if -- we're going to eventually have to come to some sort of agreement as to how long this person actually was involved in doing this. In my mind, this report -- if you look through it, this 98,000 number is -- is sort of an upper ceiling. I have not seen much higher than that. If one looks on page 15, this represents -- one thing I would point out is there's a fair amount of data out there. These -- these are not made-up values, these are real data samples taken at facilities that

were machining uranium and -- and processing and -- and roasting the chips. If you look at the Fernald dataset you will see a fairly similar distribution where many of the values fall within our model. But again, there's a 90,000 dpm repairing the inside of the furnace, there's a 50,000 over the front of the furnace. Again, if one can come up with a duty factor of how long someone did this operation, I think it's -- it's not inconsistent with our model. We have not come up with that factor yet, but I think based on some inferences, we should be able to do that.

At any rate, we have some bounding values here. There are bounding values here for furnace operations, and I just pointed out a few of these that are there that don't necessarily, you know, demonstrate that our model is inconsistent with what happened at uranium facilities.

DR. MAURO: What I see here is -- and I understand where you're going with this and --

MS. BLOOM: Can you speak up, please?

DR. MAURO: Certainly. This is John Mauro. What I -- what we have here is the chronic

intake that's been adopted is certainly conservative, and the argument that's being made here is -- you know, as a time-integrated exposure, yeah, we -- you know, we can just about capture anything that might have occurred, and we -- like for example, the previous conversation -- well, if --

MS. HOWELL: I'm sorry, this is Emily. I think that wherever the telephone mike is placed on the table, we're having trouble -- when conversations shift from one person to another -- picking up what's going on.

DR. MAURO: My apologies. This is --

MS. CHANG: Actually -- this is Chia-Chia Chang, it sounds like there's another voice in the background. I don't know if it's in the room or in the hotel, but --

DR. WADE: No, it's not in the hotel. Some -- someone -- each of you consider your situations. Someone's engaged in background discussion, sort of over their shoulder, and we can hear that. It's a woman's voice. So please, mute your -- your telephone. Don't be involved in -- in side discussions. We're hearing a woman engaged in background

discussions and it's not in this room. Thank you.

DR. MAURO: This is John Mauro. I'm speaking directly into the mike now. Does that help?

MS. BLOOM: Not really.

DR. MAURO: No? Then --

MS. BLOOM: It's hard to hear all of a sudden.

UNIDENTIFIED: Is it on?

DR. WADE: Well, wait a minute, we're going to have a technical person look at this.

MS. BLOOM: We can hear Lew really well.

DR. MAURO: Is that a little bit better?

(No responses)

No? No. Is it on?

(Pause)

I'm trying again. Testing. Is that better?

MS. BLOOM: That's better.

MS. HOWELL: Much better.

DR. MAURO: Okay, we found -- we found a live one. Let me see if I can explain -- and here is, again, a judgment call. Okay? What we're saying here is that the chronic intake is of such a magnitude that it really takes into consideration an awful lot of the variability and the uncertainty and places sort of like an

upper bound on just about -- most scenarios. And the only place where special consideration is given is that early June fire.

Now are -- I didn't -- now this is a judgment call again. Are we pushing the boundaries of that all-encompassing chronic by saying -- and in fact, not only does it capture all of the sawtooth variability that may be occurring on a day to day basis for all workers -- all 100 workers, but it al-- but it also captures the possibility that there may have been some workers there that were handling this ash, and I think this is a tough call. Is the ash-handling, which we know was there, we -- now granted that we don't know the magnitude of the exposures and the duration of the exposures, but also granted that we do know that it could have been a substantial -- at least for some short period of time, and this is more of a question for everyone around the table. Does this warrant another special treatment the way we gave the fire a special treatment, because it may be such a nature that it might kick us over. I don't have an answer to that.

By the way, I do not consider that to be an SEC

issue. This is -- in other words, you have the data, and it's really a judgment call now, do we feel that we've done an adequate job in placing an upper bound by assuming that if there was ash-handling that the chronic exposure assumption is more than adequate to account for it, or do we feel that no, maybe we better add in another spike or a few -- you know, to deal with that. I see that as a judgment call that is what I would call a site profile or exposure matrix question as opposed to something that is -- you know, what I would call an SEC issue. Again, that's my judgment of the situation, but from looking at the numbers, Jim, some of them are very high --

DR. NETON: Right.

DR. MAURO: -- and I don't know if you were to add in a few of those -- that's saying with a duty factor that is consistent with the level of activity that took place at Chapman, but I think it's worth -- worth looking into and -- and -- and coming to a sensibility that you feel is right.

DR. NETON: I think we're on the same page here. I present this -- this information more

from a -- you know, let's stimulate discussion here, because we obviously are not coming to conclusion that this is -- this is definitive. But what it does do, in my mind, is show that there are plenty of data sample points out there that one can generate bounding analysis -- bounding scenarios, at least, then how bounding, you know, are these scenarios that we've provided. It's -- it's open for discussion, I'll agree with that.

MS. BLOOM: My apologies for getting this out so late and for not clearly answering that question, but I did look at a lot of this information. There's some in the -- the Adley document, John, that you mentioned in terms of the amount of time that people spent shoveling ash in various programs. For the smaller programs, I've seen numbers on the order of three minutes spent in shoveling ash. In larger programs, NUMEC had dedicated incinerator operators who spent half their time with the incinerators. The -- in the Adley document, my recollection is that the numbers were less than an hour -- well less than an hour a day --

DR. MAURO: Yeah, I think it was .3.
MS. BLOOM: Right, and when you consider the volumes that we're talking about at Chapman, you know, you just can't -- it can't take that much time. I used to load an incinerator at a hospital where we -- we -- as a technician we burned low level radioactive waste and we would load on the order of ten, 20 2-gallon drums and boxes that were 1.5 cubic feet each and -- and various other things in there that were incinerable, and that was maybe an -- a one-hour operation, if that. And I have a feeling that the volume that I was dealing with was much larger. Cleaning out the incinerator, it was all a hand operation. It wasn't, you know, a chute operation or anything like that, and it didn't take that long. So I -- I would ha-- based on my experience both from a personal nature and looking at all the records that are available, I can't imagine that this was more than a one-hour a week operation.
DR. MAKHIJANI: This is Arjun, I -- I don't have a personal judgment about, you know, how long the chip burner loading and unloading operations might have -- might have lasted, but

I do know -- or if I'm -- I'm doing this from memory because I'm not in my office, but the Fernald 98 probable-plus MAC operation is documented -- if I'm remembering correctly -- as having lasted five hours, and 98 probable MAC was an average over the five hours. It was not the maximum measurement so (unintelligible) --

DR. NETON: Wait a minute, which -- which value are you talking about, Arjun?

DR. MAKHIJANI: No, I'm not talking about a fire, I'm talking about a maintenance operation that happened periodically with a burnout conveyor, and there was a 98,000 MAC --

MS. BLOOM: It's not MAC, I think you're talking dpm per cubic meter.

DR. MAKHIJANI: Maybe it was dpm per cubic meter (unintelligible) --

DR. NETON: Yeah, it could -- 98,000 MAC --

DR. MAKHIJANI: No, no -- well, I -- I don't -- I don't remember. I'm not -- I may have it -- I mean the document's actually in the -- in the SEC petition and I'll try to bring it up. I have that with me. But I believe it was 98,000 MAC. We've talked about this before.

MS. BLOOM: 98,000 -- you don't see anything much above 300 MAC for --

DR. MAKHIJANI: Well --

MS. BLOOM: -- even maybe -- maybe an outlier --

DR. MAKHIJANI: Well --

MS. BLOOM: -- would hit 1,000 MAC.

DR. MAKHIJANI: -- I -- I can check all this pretty quickly. I believe it was 98,000 MAC --

DR. NETON: But Arjun, was this --

DR. MAKHIJANI: -- (unintelligible) an average over five hours. I think we brought this up a number of times.

DR. NETON: What was this operation?

MS. BLOOM: I mean that would be grams per cubit meter.

DR. MAKHIJANI: Well, yes, it'd be -- the-- as I remember, I calculated the annual exposure at 70 dpm per cubic meter was achieved in a little over one minute, so I think that was it. The -- the --

DR. NETON: Well --

DR. MAKHIJANI: That was a Fernald measurement. I -- it's not my number. It was their number --

DR. NETON: Well, but what I --
DR. MAKHIJANI: -- and it was their document. It wasn't a highest measurement.
DR. NETON: But is it a comparable operation? What kind of operation was this?
DR. MAKHIJANI: As I said, it was -- in my mem-- according to my memory, it was the cleanout of a burnout -- it was maintenance operation, cleaning out burnout conveyor in a particular --
DR. NETON: Okay, the burn-- the burnout vessels are somewhat different than the furnace. We have --
DR. MAKHIJANI: I -- I'm -- I'm just -- I'm just putting it on the table because a lot -- you've compiled in the 20-odd pages a lot of different operations and presented data from a lot of different operations to argue for the plausibility --
DR. NETON: Right, but --
DR. MAKHIJANI: -- of a number.
DR. NETON: -- we're trying to make --
DR. MAKHIJANI: And so I'm -- I'm trying -- just -- just a minute. I'm -- I'm -- I'm putting this number on the table in that same

spirit is that you -- you -- there is -- there are very high measurements that are higher than the ones we're talking about here, and if we're going to say that we've compiled and done a survey of the data, including Fernald, then we ought to have a complete list of these things. As I said, I don't have a personal opinion about --

DR. NETON: Arjun, you --

DR. MAKHIJANI: -- about how long these operations lasted.

DR. NETON: -- you need to consider the thrust of this document. The title is "Review of Internal Exposure Related to Uranium Machining Operations" --

DR. MAKHIJANI: Yeah.

DR. NETON: -- and we -- we expanded that to include the roasting operations because --

DR. MAKHIJANI: Right.

DR. NETON: -- that's part of machining.

DR. MAKHIJANI: Right.

DR. NETON: If it's a manufacturing of dingots or -- or derbies or something, I -- I would suggest that it may or may not be relevant. We need to consider that.

DR. MAKHIJANI: Yeah.
DR. NETON: 'Cause we do have here a complete page of air dust samples taken at a uranium furnace at Fernald over a several-month period, and the largest sample we have here is 92,984 dpm per cubic meter --
DR. MAKHIJANI: Uh-huh.
DR. NETON: -- by far the highest sample. So -- and we -- we can certainly consider it. I mean I'm not saying we shouldn't look at it. But we need to consider the relevance of -- of that particular sample to what we're trying to accomplish here, which is the sam--
DR. MAKHIJANI: I'm not -- I'm not stating that it is relevant or not relevant. I'm just saying so long as you're doing a survey and saying that some things are credible or not credible, that -- and -- and using Fernald measurements I think we've brought up a number of times, and it at least ought to be part of the deb-- (broken transmission).
DR. NETON: It would help if you could --
MS. BLOOM: I -- I do think that -- that while I tried to find everything that could possibly be relevant to this issue, I think it really is

important to consider the -- the information in terms of whether it's a reasonable estimator for Chapman or whether it gives us an idea of how high these types -- you know, how high types -- incinerating -- incineration types of operations can be. But I think when you're talking about burnout furnaces and other things, you're talking about sizes that are much longer -- larger. You're talking about source terms that are much higher, and -- and so that has to be taken into consideration. So -- so in that light, I would take what you say, Arjun, certainly with -- that's an example of something that has to be definitely bounding. I think -- you know, the number you're -- you're stating is on the order of ten grams per cubic meter of uranium, which to me seems an inconceivable amount to be exposed to for any extended period of time --

DR. MAKHIJANI: Well, then we have to throw all the Fernald measurements out because this is part of their documentation.

MS. BLOOM: Well -- and I would like to -- Arjun, I'm not saying that. It seem-- I'm telling you --

DR. MAKHIJANI: If it's inconceivable -- if it's inconceivable, then everything at Fernald is inconceivable.

DR. POSTON: No, Arjun, that's --

MS. BLOOM: No, no, no, wait, wait, wait. I'm saying that -- that in the argument that SC&A has presented they're saying a -- an exposure on the order of hundreds of milligram is a large exposure. So you're talking a factor of 100 higher than that.

DR. MAKHIJANI: Not my number.

DR. POSTON: Arjun, it would be very helpful if you would provide that document. You said you --

DR. MAKHIJANI: I have -- I have provided it before to NIOSH and I will do so again.

DR. POSTON: Okay, because you're --

DR. MAKHIJANI: It's part -- it's part of --

DR. POSTON: -- because what you're saying is you're --

DR. MAKHIJANI: -- the Fernald petition.

DR. POSTON: What you're saying is that this is your recollection, and that's -- it seems inconceivable, so --

DR. MAKHIJANI: Well, I (unintelligible) to

bring it up.

DR. POSTON: -- it would be nice to have that documented.

MR. ROLFES: Yes, Arjun, I think it would be more appropriate to provide the document to us before the meeting so that we can discuss it.

DR. MAKHIJANI: I have provided it before and I've cited this number during Mallinckrodt and I will do so again.

MS. BLOOM: It's the Fernald petition that it's included with, Arjun?

DR. MAKHIJANI: I be-- yes, I believe so, and I've also provided it independently of the Fernald petition.

MS. BLOOM: Okay. Thank you.

DR. NETON: Yeah, I -- I don't deny you couldn't stir up some very large con-- I remember -- I remember when I was at Fernald when they would actually vacuum the inside of a dust collector. I mean you got huge values in there. But you know, it was an instantaneous type exposure. Uranium settles out fairly quickly. As a matter of fact we have, in this document, a fire that happened over a drum at Fernald cited. And if I recall, within 40

minutes those samples dropped down from thousands of dpm per cubic meter to hundreds of dpm per cubic meter once the fire was extinguished. Uranium being a heavy metal, of course, it drops out of the air fairly quickly. To sustain something like that for five hours just -- it would have to have some mechanical agitation going on to do that. We'll look at the document.

DR. MAURO: This is John.

DR. MAKHIJANI: I may be wrong. I -- I'm just -- I'm going to bring it up and then we can talk -- come back to it.

DR. WADE: We got it.

DR. POSTON: We understand.

DR. NETON: It's on the record. Okay. I'm not sure much what else to say other than I -- I agree with John's take on this, that we -- we have values here that -- that provide what we believe to be bounding estimates. The matter is then, in our professional judgment, is -- are the values that we've assigned in the matrix, do they encompass those bounding values or not, and it's going to come down to figuring out and making a -- a judgment as to how long a

person worked with briqueting operations or furnace operations.

I will say, in light of -- the spirit of full disclosure, that we are -- there's another document out there that we're waiting on. I really don't like springing documents on people, but I ran across in the last week or so -- there was a *Nuclear Science and Technology* article that was published in the -- the early '50s I think that talked about the Brookhaven reactor and the loading of the slugs. There was a nice little piece in there about what Chapman Valve did for that operation. And that's where, you know, you read about the 4-inch slugs and what they did. They milled those little grooves in the side and -- and that sort of thing. But in that document was cited a H. K. Ferguson report issued in 1948 -- I think it was '48 -- that talked about a 95-page report that they wrote that covered the Chapman Valve piece of the operation, including health and safety requirements and things of that nature. We tried to get that document. It's of course hard to get, but so far they've not said no. I mean it does exist somewhere,

and that may shed some more light on it. But I think, even without that document, we can make some -- some bounding valuations here, so -- I -- I would agree that I -- I don't know that this is an SEC issue. It's a matter of how -- how adequate the model is as a bounding document and whether we incorporate some of these pieces that are in Cindy's review to add a separate exposure piece for uranium operations -- uranium burning operations or not. It's -- it's (unintelligible) --

MS. WU: This is Portia Wu again from Kennedy's office. I guess the question we have from the Hill is sort of -- you know, I know some of these are SEC issues and some of them are not, but to the extent that there are outstanding requests for information with some other departments or these other reports, I think it's important to have as much of this be considered by the working group as possible, just from a perspective of that makes people on the Hill and also the claimants feel most comfortable. I understand the working group wants to move ahead and we appreciate that, trying to move ahead and get to it quickly.

But at the same time we'd like to feel like everything's being considered. I've got to go brief my boss now, but -- but appreciate everything that's been said.

DR. WADE: Thank you. Give our regards to the Senator.

MS. WU: Will do.

DR. MAKHIJANI: I have -- I have the document. It is on page 294, starting -- of the Fernald petition. It is from Kline* to Starkey*, December 7th, 1960. It -- it has burn-- operator cleaning under burnout conveyor in dpm per cubic meter, the high was 3.1 million, the low was 500,000, and the average was 1.3 million. That was one set of readings. And the year earlier readings that I was finding were a high of 9.3 million dpm, low of 4.6 million, and an average of 6.8 million. So the average was 97,000 times MAC. And so I -- my memory was correct. I'm not growing as old as fast as might be imagined.

DR. NETON: And I guess I'd ask the question, is that -- is a cleanout under a burnout conveyor relevant to Chapman --

DR. MAKHIJANI: That's a separate question. I

wasn't asserting that it is relevant. I'm just saying that -- I just want to, for the record, since there was a question as to whether this is conceivable or not, these are -- these -- in the millions of dpm per cubic meter are Fernald measurements a -- a dozen years later than the period in question.

DR. NETON: Okay.

MR. ROLFES: The source term is several orders of magnitude different and --

DR. MAKHIJANI: That's not the point.

MR. ROLFES: -- the operations are not similar, so...

DR. MAKHIJANI: The source term for -- I have argued many times that it is wrong to consider a production source term for a population and mix it up with the potential for individual exposures unless you can show that the times of operation for individuals are lower. I know that is being argued, but I think the basis to say (unintelligible) hour per week, half an hour per week, two hours per week appears to me to be pretty slender. Whether it's an SEC issue or not is not a question, but I think it should be clear that there are no data from

Chapman Valve itself. And to infer from medical incinerator personal experience from, I don't know, the 1990s and back-extrapolate into 1948 as -- as one of the first (unintelligible) arguments appeared to me to be pretty thin gruel.

MS. BLOOM: I don't think I was making an argument that that was a -- the same operation, but I certainly would make the argument that loading an incinerator, which this was a -- the -- the operation is not very different since the 1940s. I don't know about you, but when I was growing up my family had an incinerator that they routinely loaded and unloaded. That was a smaller one. The hospital I worked in was a much larger one. I think the time for that amount of work, even though it's a personal experience, certainly is relevant to an operation like this where -- where this particular incinerator we're talking about was described as a small chip burner.

DR. MAKHIJANI: No, I agree the time is relevant. It's just a question of how it shall be established, and I leave -- you know, I -- I just -- I'm putting -- I'm not saying how it

should be established. I'm just saying I'm putting that -- that question is on the table (unintelligible) --

MS. BLOOM: And I agree with that, and -- and what I was trying to say is that I'd looked through many documents and looked at -- at times which I have not summarized here, but there are -- there is information about the time it took to load some of these things and to -- to clean out the ashes, and that information is in records. It's not particularly for Chapman, but -- but I think that, based on what we know about the operation at Chapman, I think there's some reasonable assumptions that can be made.

DR. WADE: Okay.

DR. POSTON: I have -- I have -- I guess I'm the person that has questions as to what's the path forward here. We have a situation where we've had some new documents that we haven't had a chance to review. We have a potential of having another document that may shed light. We now have a statement from people on the Hill that they want us to consider all the data and so forth and -- after they have also said they

wanted us to get on with it, so conflicting instructions based on the situation. So I'm not sure how to proceed. Maybe someone with more experience -- this is my first experience -- if someone can help.

DR. WADE: I can, but go ahead, Jim.

DR. NETON: I think -- you know, I only brought up that other document because I thought it might, you know, eventually help refine this and I don't want to spring that out at the last -- 11th hour. But I think, even without that document, there's enough information here to -- to have a -- to show that we have an ability to bound these exposures. And -- and I agree with John -- I think John still might agree with this, that it's not an SEC issue at that point. It's just how much more refined we can make it.

DR. MAURO: The only thing I'd like to add for this discussion is when we see very high airborne dust loadings, the extent to which at about the same time there may be some bioassay data -- now I don't know whether or not some of the-- in fact, Arjun, this is a question for you -- and when you were looking at the records for Fernald where you observed some very, very

high uranium dust loadings, are there concurrent bioassay samples? Because one of the things I ran into in reviewing -- and this is interesting -- some other sites, they often refer to air samples where they captured what they called a brick in the sample, a brick being a relatively large particle -- not a brick, but a relatively large particle -- that has a lot of activity and it -- so all of a sudden you've got this very high number in terms of becquerels per cubic meter, but it's on a particle that's large --

DR. MAKHIJANI: Right.

DR. MAURO: -- and it's not respirable. Now I don't -- now -- and I think that -- and I'm not saying that's what happened. I'm saying, though, if there's some bioassay data that's coupled up with the same time period, the same activities, that would help get a -- a richer insight into -- into this number.

DR. NETON: Well, first, I'd be surprised if they weren't wearing respirators in an operation like that where they knew there were large dust loadings, so the bioassay might not be very informative. But I did

(unintelligible) --

DR. MAKHIJANI: Yeah, I -- I -- I don't know -- the individuals are not identified in this memo. There is a date of the operation and a plant number, so it may be possible to go and -- and check. I -- I can't see that it says whether people were wearing respirators or not. It may. I have-- I haven't reread the whole thing.

DR. NETON: But my point is, even if we saw low urine values, we couldn't -- the argument could easily be made they were wearing respirators and they're not relevant if we knew or not. We do have those urine samples that I pointed out earlier on from NUMEC, which was a -- a furnace operation. Those values are within the realm of what we defined.

DR. MAKHIJANI: Jim, was that a ventilated operation at NUMEC?

DR. NETON: It was described as primitive. Now I'm not sure what that means.

DR. MAKHIJANI: It was in the mid-'60s.

DR. NETON: It was in the '60s, that's correct.

DR. MAKHIJANI: Yeah, I -- I think that it might be useful, since it is an important part

of this argument, to determine whether it was a ventilated operation or not.

DR. NETON: We could certainly do that -- or try to determine that.

DR. WADE: This is Lew. Let me talk a little bit in response to the Chairman's sort of query, that --

DR. POSTON: Our fella needs a break. No? Is that okay? Okay, sorry. Go ahead.

DR. WADE: So this is Lew, so -- again, and I'll try and present my thoughts, in no way trying to force an outcome or a judgment because that's really for the working group. There -- there are really two options that you face. We have a workgroup meeting coming up in May, early part of May. Following the normal procedures of a workgroup, it is possible that this workgroup could go to that May meeting and present its thoughts and findings to the Board, with a recommendation that the Board vote on the Chapman Valve SEC petition at that meeting. Now again, remember that the way this Board has done business, the workgroup is not bringing a recommendation. The workgroup is bringing its findings, presenting them, the full Board

debates them and then the full Board takes -- takes a vote. So you could go to that meeting, present your findings, reports made available, and encourage the Board to vote on this SEC petition in May.

Second point is that you could feel there are enough loose ends -- and you know, you've identified two or three of them now -- you could feel there's enough loose ends that you want to tie up those loose ends before you come to the Board, present and suggest a vote. You could try and tie up those loose ends before May. If not, then you'd be looking at the likelihood of July, the July meeting, for this workgroup to present its findings.

Now again, that's up to you. We always face the pressure of 100 percent completeness versus timeliness. You know, we've heard the arguments, the impassioned arguments that there are people affected by this who will die between now and July, in all likelihood. And you know, we have to -- we have to feel that pressure. On the other hand, these people have a right for a complete and an appropriate decision. So I mean the workgroup faces that

now. It'd be wise to talk about that now. But again, your options really are to bring a concluding discussion to the workgroup in May or to continue to work to -- to wrap up these loose ends and look at a date later than May, likely July.

DR. POSTON: Do we have any opinions from the other working group members as to how they feel we should proceed?

DR. ROESSLER: This is Gen. I've been listening to a lot of comments here, and I think a lot of it, in my view, has been a little off-track. I'm not quite sure -- I don't have a good idea in my mind as to where we really stand. I feel like Jim didn't get a chance to completely finish his report, and I don't know whether there's time to do that today.

DR. WADE: Yeah, there is. Other workgroup members want to comment at this point? We're not necessarily trying to reach conclusion, but get a sense of the workgroup.

MR. CLAWSON: Yeah, this is Brad. I've been listening to all this and it seems like -- you know, we -- we get into this all the time. We

have a lot more information that comes in and stuff, but the most important thing we've got to remember is when we give a finished product before the Board we want to make sure that we have all of our bases covered. That's just my personal opinion, but --

DR. WADE: Your personal opinion matters.

MR. GIBSON: This is Mike. You know, I know we need to be timely and -- and give our -- our findings to the Board and so the petitioners can have a timely, you know, vote on their -- their petition. But it just seems to me that this -- from the beginning and in every case, this coworker data modeling from different sites and different operations -- I just feel we almost have to go down every path. I mean, you know, it seems to me every -- every different site does things differently. They may do preventative maintenance at different frequencies. They may do operations different, and I think it's important to get every issue on the table so we can make sure that we do really find a -- a true upper bound and something that's fair to people at a different site.

DR. WADE: Okay. Mark?

MR. GRIFFON: Yeah, I'm not sure -- I'm sorry, I'm not sure that I'm quite ready for the path forward discussion, but I think -- I think there's a few more things to discuss today. And I -- I -- you know, a couple of them involving -- I still have follow-ups on my representativeness question. I'm looking at this report today that was -- you know, that's on the O drive and -- and you know, I -- I think I just have a few follow-up questions on that. I'm -- I -- I do appreciate Jim's statement about the -- the enriched uranium. That -- that issue may go away for me because my -- my real issue on that is are we missing the boat on what was done at Chapman. Was there a wider window of production involving other materials, and if that's being kicked to DOL and outside of our purview at this point, that -- that satisfies me, so that's a big thing that's off the table, I think maybe. And with that in mind, I think we may be able to -- you know, after this meeting we may -- we may have a fair amount on the table. I think that that -- that document that Jim mentioned would

be -- might be very helpful if we can get out hands on it before the May meeting because that may put everything into context. The only -- one question I had on the document you posted or -- and that Cindy put together was, you know, it looks to me, glancing at it, that a lot of this stuff was done in the '52 through '55 time frame and are we confident that the operations would have been -- you know, that the operations would have been, you know, consistent with Chapman operations in '48. I imagine there was a learning curve in those early years and might -- you know, arguably might have been a little sloppier in the early years as far as, you know, exposures. So that would be my only question on that end.

MS. BLOOM: I -- I think as I looked through the data, Mark, there was a variety of use of safety practices and it wasn't necessarily consistent for any particular time period or any particular facility. It seemed more to be -- you know, if I had to tie it to something, if the job appeared to be a one-time job where they were doing machining on a depleted uranium casket which wasn't part of their typical

operations, it looked like there wasn't ventilation that was -- was employed for that particular operation, which occurred in later years -- I believe in the either late '50s or early '60s. But I -- at some of these sites the material that was being machined was enriched uranium, so the -- so the -- somebody's got two phones going on?

MR. GRIFFON: I don't know what --

MS. BLOOM: So -- so in that case, the activities are going to be higher unless -- unless the data's presented in mass concentrations. You know, anywhere from a factor of two to 100 higher than we'd be talking about here, just to try to get into the same unit. So ther-- there's -- this is -- is to give people an idea of what was happening out there.

MR. GRIFFON: Right.

MS. BLOOM: Not any one site is absolutely identical to what was happening at Chapman.

MR. GRIFFON: Right.

MS. BLOOM: I would be the first to say that. But I -- my feeling as I went through all these documents is that the preponderance of evidence

indicates that the Chapman Valve exposure matrix is reasonable and favorable to the claimants, that -- and that definitely there's a certain amount of professional judgment that goes into that call. And we --

MR. GRIFFON: Yeah.

MS. BLOOM: -- we all come from different backgrounds and --

MR. GRIFFON: Well, I gue-- I guess the one -- the one thing that I would say is this -- going back to my question on representativeness of the urinalysis -- I mean I -- I still look at this and say, you know, machining operation and we've got three machine -- machinists ever sampled out of your 40 or whatever urine samples, and when I look at that list, Jim, that we were talking about, the external badge data, I look at the -- what I would call operational jo-- now this is very -- you know, just doing it here while we're on the phone call --

DR. NETON: Right.

MR. GRIFFON: -- and not counting inspectors, I was counting, you know, foremen, helpers, all operational jobs that I could find, and it

looked to be about 30. I -- I agree it's not a -- you know, it's not a huge population from what we have here for the data. But you know, thi-- this question that came from -- I think it originally came from the -- the Senator's letter, was the highest externally exposed were not monitored for urinalysis, and the hypothetical argument was that well, you know, they -- it wouldn't necessarily be true that the highest external exposed person was likely to receive the highest internal exposure, but when you look at the -- these sheets and the job types, you -- you do tend to ask yourself 'cause they include the brusher, the centerless grinder, other machining type operations. And so the only question I would have is okay, we got three machinists out of these 40 samples, you know, are we really -- you know, I know that we're -- every -- all the data you have, Cindy, I agree you've -- you've been claimant favorable -- you know, I think very claimant favorable. The question is, were they not monitoring, you know, the six or seven machinists that were in the dirtier -- dirtier operations. And I have no reason to believe

that, except for this external data that kind of suggests that some of these individuals that have high externals were -- and -- and jobs which I would think, at least looking at the job titles only, seem to imply a high poten-- or at least as high as these others, potential for internal exposures and they weren't monitored. So then I would say well, okay, we've got this other set of data and, to the extent we can, I think we -- you know, I -- I still think it's probably something that we can bound --

DR. NETON: Right.

MR. GRIFFON: -- 'cause you've got all this other -- other facility data. But I would argue this H. K. Ferguson report that you just mentioned, Jim, if that's going to give us an insight into not only operations but although -- although -- also health and safety during that time period of 1948.

DR. NETON: (Unintelligible)

MR. GRIFFON: Then you can -- then you can bridge the gap back to '48 and say okay, I've got urine data, got all this data from the early '50s that suggests we're in the right

ball park. On top of that we've got this other report that says, you know, this is what they were doing and how they were doing it and it's consistent with what we see in this -- in these reports from the '50s. That would --

DR. NETON: I can't guarantee we're going to produce that report --

MR. GRIFFON: Right, right, right.

DR. NETON: -- and I only brought it up because I didn't want to spring it out in a -- in a week or so --

MR. GRIFFON: Yeah.

DR. NETON: -- and say well, you knew about this -- when did you know about it kind of thing.

DR. POSTON: Mark --

MR. GRIFFON: But --

DR. POSTON: -- and the -- and for the working group, I didn't intend asking the question to bring a determination to this. What I was trying to ascertain is how to use the time that we have remaining today most effectively, and I -- I have no problem delaying any kind of decision, those kinds of things, so that we can explore -- Gen pointed out that she didn't feel

like that Jim had a chance to finish his presentation. Mark, you indicated that you had some questions that you would like to ask. And so I would like to proceed along those paths so that we make sure that the working group has all the information they feel like they need. And if the H. K. Ferguson report should surface and -- and we can review it, then I think that would be a huge asset to --

MR. GRIFFON: Yeah.

DR. POSTON: -- this whole thing, so that's where I'm coming from. I was just sort of -- since I'm -- this is my first time, I was asking for help.

DR. WADE: Which now you have, so I think now you know how to use your time.

DR. POSTON: So I think we prob-- even though it's -- it's 11:15 and lunch is almost over the horizon, we probably need to take a break.

DR. WADE: Going to try to take ten minutes and then be back. Okay? We're going to mute the phone and un-mute it back in ten minutes, which by my watch is 25 after 11:00, Eastern.

DR. MAKHIJANI: John -- John, I'll be signing off.

DR. MAURO: Okay, Arjun. Thanks.
DR. MAKHIJANI: Thank you.
(Whereupon, a recess was taken from 11:18 a.m. to 11:28 a.m.)
DR. WADE: Okay, let me make sure that -- that all are out there. Brad, are you with us?
MR. CLAWSON: Yes, I am.
DR. WADE: Mike Gibson?
MR. GIBSON: Yes, I'm here, Lew.
DR. WADE: Mark?
(No response)
Is Mark back on?
(No response)
Mark, are you with us? Are you muted?
(No response)
Gen, are you with us?
(No response)
Gen Roessler?
(No response)
On the line, un-muted?
(No response)
We'll wait another second for -- a minute or so for Gen and Mark.
DR. NETON: Well, while we have a second, Mark -- or Brad, rather, did you end up getting a

copy of that document that I mailed out yesterday afternoon?

MR. CLAWSON: No, I did not. I was going to ask you for that.

DR. NETON: Well, I -- I sent it to you and I looked at my e-mail quickly this morning and I got a message undeliverable thing, so I'll try to send it to you again. It is out there on the O drive if you can access it, but when I get back to the office I'll resend it. Hopefully your address is valid, there's just some hiccup in the system.

MR. CLAWSON: Okay, yeah, if -- yeah, I'd appreciate that. I've also got a -- I'll sit down with Larry, but maybe at another time. I've got to be able to get access to the O drive. I haven't been able to do that yet.

DR. NETON: Okay.

MR. CLAWSON: Thanks.

DR. WADE: Mark, are you with us?

(No response)

Mark? Gen?

DR. ROESSLER: I'm here.

DR. WADE: Okay. Only missing Mark. Mark Griffon, with us, possibly on mute?

(No response)

We'll wait another moment.

(Pause)

Mark Griffon?

(No response)

John, you can begin. I'm sure Mark will be with us shortly.

DR. POSTON: Well, I'd like for Jim to continue to summarize his report. I think it's important that everybody have a chance to read it, so I guess that's going to dictate some delay in some of our decisions, but we certainly want to have him summarize what -- what's in the report for us, so we'll finish that up.

DR. NETON: Okay. Well, it wasn't my intention to go over the entire report today because frankly this just came out yesterday and I -- I've read it and I -- I really intended this morning to just highlight what I did, which was the NUMEC and the Fernald and -- and some of the particulars about Chapman Valve. Unless Cindy might have more that she wants to say, as the author, that she can fill in some of the holes that I may have -- may have left. But I

really don't have a lot more to say about the specific other, you know, 12 or 13 sites that we've covered. I guess I would leave it to the -- to the working group to -- to read the document and -- and come to their own conclusions rather than me lead them down that path.

DR. POSTON: If we have questions is it appropriate to address them to you or to Cindy?

DR. NETON: Well -- well, both. I'll try to answer them as best I can, but Cindy is -- is the author who will -- will have to help me in certain parts, I'm sure.

DR. WADE: If an individual workgroup member wanted to ask a question to Jim, that'd be fine.

DR. NETON: Oh, you mean after the meeting or...

DR. WADE: Right.

DR. NETON: Oh, yeah, please forward them to me and then I'll make sure that they get answered. I thought you meant right now.

DR. POSTON: No. No, I was thinking --

DR. WADE: Some people --

DR. NETON: I'm good, but not that good.

DR. WADE: -- are studying -- are not going to be able to study until after the meeting, so individual questions -- but again, if there's anything that then warrants workgroup action, then we'd have to get the workgroup together. We can do that by phone.

DR. NETON: Yeah, ple-- everything e-mail directly to me and I'll make sure that we -- we get the appropriate answer out to the entire distribution list.

DR. WADE: Mark, are you with us?

(No response)

Mark Griffon?

(No response)

Okay.

DR. POSTON: Next thing I wanted to do was address Mark's questions.

DR. MAURO: Well, while we're waiting, I wrote down some notes as to -- right now I've identified three items that sort of emerged from this roundtable discussion. Cert-- and please let me know if I got them right. It sounded like there was still a little bit of discussion in this type M versus type S mixture, whether or not in fact if you -- you

know, looking at the -- the urine data for the .08 and this business of the .03 and somehow if you assume it's all type S or maybe a combo of type M and type S, you could actually come up with an intake scenario that might be a little larger than the one that you guys elec-- folks selected. Is that a correct characterization of the conversation that I overheard?

DR. NETON: I think that's correct. We need to investigate that and, you know, right now we have two scenarios, pure type S, pure type M. We could look and see if -- if a combination of type S for the fire, M for the machining operations resulted in some higher dose. We can -- we can do that and we may end up -- if it did, we might -- likely would end up adding a third exposure scenario. If it's lower, then we would just stick with what we have.

DR. MAURO: The second item I have is the degree to which that M. K. Ferguson report may enrich our understanding of the history of the site. To the extent that become available, that would be great.

And the third item I have is of course whether or not it is prudent to factor in an additional

spike for the incinerator contribution or -- or whether the current base-- baseline chronic exposure is more than sufficient to accommodate that potential spike.

Those are the only three items that I -- that I wrote down as requiring some action, none of which is an SC&A action item, as I understand it. But I -- am I correct that those are -- are there other items that I might have missed?

DR. WADE: Well, I think we have Mark's issue.

DR. MAURO: Yeah.

DR. WADE: Mark, are you with us?

(No response)

Still not.

DR. POSTON: I have -- I have a question, that I probably should know but don't. Mark was focusing on the machinists, but based on the information I read about fabrication of the rods for -- the fuel rods for Brookhaven and their encapsulation and so forth, it seems to me that the people with highest potential exposure were not the machinists but the centerless grinder people.

DR. NETON: Correct, I think -- I think on machinists he would -- he would include the

centerless grinders and --

DR. POSTON: He would include them?

DR. NETON: I would think so.

DR. POSTON: Because those are the people that have generated --

DR. NETON: Right, and we've -- we've run into that before, and our opinion is 70 MAC air continuous exposure for a centerless grinder, based on what we've seen at other sites, is not unreasonable.

DR. POSTON: So that was a -- would be a chronic exposure?

DR. NETON: It would be -- we would assign them a chronic exposure of 70 -- it essentially ends up being a time-weighted average exposure of 70 times the Maximum Allowable Air Concentration.

MR. ROLFES: And we do have bioassay data, as well as film badge data --

DR. NETON: We have --

MR. ROLFES: -- for the centerless grinder and (unintelligible) operator (unintelligible).

DR. NETON: Yeah, Mark's -- I think Mark's position was that we don't know that we've captured all of the site -- all of the machinist operations and there may be some out

there that are dirtier -- this has become -- this has been an issue across a number of sites is when you have a set of bioassay data, do they represent the upper end of the exposure scenario. In modern era, I would say yes. I mean it -- normally when you sample workers, you don't go and try to sample the low end. You sample either the high end or what you would believe to be a representative distribution. That's a scenario that, with these old sites, we're never going to be able to definitively prove one way or the other.

DR. WADE: Mark, are you with us?

MR. GRIFFON: Yeah.

DR. WADE: Okay. Mark, what -- what happened is we were just sort of binning issues and John Mauro went through a put three on the table -- and John, I might ask you to do that again, briefly -- and then we were waiting for you to define your issue. John.

DR. MAURO: Yes, just as a -- keeping track, I wrote down a minimum -- minimum of three items. One I'm calling the type M versus type S combination scenario, which may very well result in some organ exposures that are higher

than the current exposure matrix, and it's my understanding that NIOSH is going to look into that.

The second one is the M. K. Ferguson report, the degree to which it can be obtained and provide further information that could help us get a richer understanding of the -- what was going on at Chapman in those early years.

And the third one I have is the potential for the exposures from incinerators or incinerator use to have enough of a potential contribution as a spike or occasional spike that warrants it being added to the scenario, similar to the way in which the June fire was added to the scenario. That's something that -- that I think we left as worthy of further exploration.

So I -- I only had those three, but certainly there might be more and -- that need to be added to the list.

DR. WADE: Mark, and people were looking at your issue of representativeness of the data and starting to debate it, but best (unintelligible) --

MR. GRIFFON: Yeah, I think I heard Jim Neton as I -- as I just came on was --

DR. WADE: He was talking about centerless grinders versus machinists, and so do you want to define your issue and -- and possibly trigger some discussion?

MR. GRIFFON: I -- I think it's pretty well -- I think it's pretty well defined. I -- I think -- I haven't had a lot of chance really to look at this paper, and I apol-- I looked on the O drive last night. It wasn't there, and then I think it took a day to get on or whatever, but it -- it's here this morning, but if -- you know, my -- my question -- and I think Jim was -- was framing it well, was that, you know, it doesn't -- you know, am I convinced that they were monitoring the highest exposed people for internal exposures. I'm -- I'm not necessarily convinced.

And then the second part of that is, however, can we, with other data that we have relevant -- you know, applicable to this time period -- I would -- I would throw that on top -- and it -- it might be that you've covered that in this report. You know, with that oth-- other data, can we still bou-- nonetheless still bound -- bound the -- the, you know, potential exposures

here for the Chapman employees. And I -- I think -- you know, all -- I -- I think the evidence is leaning toward the -- the fact that you -- you have enough information to be able to bound that -- those internal exposures based on, you know, representative machining sampling from various facilities over this time period. So -- but I would leave myself a little -- I -- I would like to reflect on this paper a little more. I haven't had -- I've been looking at it while you've been talking, but -- intermittently.

DR. WADE: You'd -- you'd ask --

MR. GRIFFON: And -- and tha-- I -- I guess that's where I would stop this, is that -- I mean for me, that would -- that would -- and the -- the H. K. Ferguson report would really I think be very -- well, we may get it and say oh, boy, we thought this was going to be something --

DR. NETON: Yeah.

MR. GRIFFON: -- it's not, but it -- it could really be helpful in making sure that, you know, yes, we're -- we're -- we're correct that -- you know, we're correct in assuming that

these other facilities are -- were doing pretty much things the same way as we thought Chapman was doing them, you know, and therefore we -- we're confident that these samples are bounding. But that -- you know, I think -- I think we might have enough. My concern was that the Chapman data itself I think -- you know, I wasn't convinced that the highest exposed people were monitored for internal exposures.

DR. WADE: Okay, so you would add a fourth to John's list and the fourth is that more of an in-depth review of the white paper provided by Cindy last night.

MR. GRIFFON: I suppose so, or just a chance for us to -- you know, I think that -- I think a lot's there and I think I -- at least for myself, I would like an opportunity to look at it a little closer.

DR. WADE: Okay.

MR. GRIFFON: But I also would a-- you know, as I said, I -- I think it seems to support their -- their conclusions, so...

DR. WADE: If possibly I could have just a brief terminology discussion. I was talking to

John before and there are relatively new Board members involved, and those of you who have been around this table having these debates throw around the term "is it an SEC issue or isn't it," and I think a little bit of clarity there would be in order as you sort of look at your path forward. And -- and without being too wordy, you know, people come and petition the government to say you should add the -- a class of workers to the Special Exposure Cohort. That means they would be paid -- if they could show that they worked at the facility for sufficient amounts of time, if they had one of the covered cancers. There'd be no need for dose reconstruction. The premise is because you can't do dose reconstruction, and the -- the bar that's set by the regulation is can the government demonstrate that it can bound dose with sufficient accuracy, or go beyond that. And there are always two parts to that. It's the bounding dose, but then it's tempered with the sufficient accuracy. This -- this Board has -- has come to find itself in situations where the bounds were so unreasonable that they didn't

pass the test, so it's bound with sufficient accuracy.

If it can be demonstrated that you can bound dose with sufficient accuracy, then theoretically it's not an SEC question. You -- you deny the SEC petition and you get on with doing dose reconstructions.

Some of these more esoteric issues you're talking about would have to be ironed out as you would do dose reconstruction, and John has defined the term that we call those "site profile issues," instructions to dose reconstructors.

So the big question a group like this faces is can doses be bound with sufficient accuracy for the workers covered by this petition. If the answer to that is yes, then the recommendation logically would be to deny the petition and get on with doing dose reconstructions, which would require you to work these more detailed issues to closure. But that's what you face, and I'm sure that's boring to most of you but may be enlightening to -- to some. Okay?

MR. CLAWSON: Lew, this is Brad.

MR. GRIFFON: Also -- oh.

DR. WADE: Yes, Brad.
MR. CLAWSON: I -- I was just wondering, you know, and I read this in reading through this Chapman report and stuff, I've heard that we've got one sample with high enriched uranium and one -- now I'm hearing today that we don't. Have we come to closure on that?
DR. WADE: I would say yes. I -- I think everyone would agree that there are -- there is one, two samples -- the terminology might be debated, but I think everyone agrees that those samples represent an exposure outside of the time period involved in this petition, outside of the time period for which this is a covered facility. I don't think there's any debate about that.
MR. CLAWSON: Okay, I just wanted to make sure that I was clear where we were going with that.
DR. WADE: Okay. Thank you, Brad.
DR. POSTON: Mark, did you have additional comments, questions?
MR. GRIFFON: Yeah, ju-- just -- after Lew's discussion of SEC and site profile issues, I think John Mauro's list that you just raised, I think that first one, the M and S solubility

thing, since I brought that up, I believe that's a site profile issue, not an SEC issue. I mean that might -- it might or might not affect intakes and, you know, the site profile, but it's not going to affect whether you can bound a dose, so --

DR. WADE: John is nodding his head.

MR. GRIFFON: -- just to put that on the table. Okay.

DR. WADE: And we don't know the M. K. Ferguson report -- I mean there's reason to believe that we won't be surprised by it, but until we see it, we don't know it. And I think the spike for incinerators, the question is if -- if it's determined that you need a spike for incinerators, then there does appear to be information available on which to base -- to make that exposure matrix determination.

DR. POSTON: That would require some sort of assumption -- how often the furnaces were cleaned out, those kinds of things. We don't know that.

DR. NETON: But we -- we don't know that for Chapman Valve. We have evidence from other facilities -- similar facilities -- to what

that time frame is. But I would suggest that the time is somewhere between almost zero and full time, and we ha-- we know what -- we know what the concentrations are.

DR. POSTON: That's quite bounding.

DR. NETON: Well, what I'm saying is they could be bounded and it -- it's -- probably full time is overkill, but you know, I think we could certainly get to a point where we'd all agree that a certain value was a reasonable amount of time, whether it's half-time, one hour or 30 hours. I think -- I'm confident that we could come to some agreement as to what a reasonable length of time would be, and then we would apply that air concentration that we observed at these other facilities, maybe the high end, and see if our model -- current model would bound that. If not, we could make adjustments.

DR. MAURO: I -- I think it also would be worthwhile addressing Arjun's point regarding this -- this outrageously high --

DR. NETON: Yeah.

DR. MAURO: -- outlier, sort of like -- you know, something has to be said when -- you know, when you are confronted with a scenario

like that to understand it within the broader context and where it's applicable and where it's not --

DR. NETON: Exactly.

DR. MAURO: -- it's going to be very important.

DR. NETON: Yeah, I agree.

MS. BLOOM: I just looked at that number that Arjun had quoted and it looks like the person was removing the plate beneath the burnout conveyor belt, and the dust was falling on their head when they removed the plate and that's where the breathing zone was taken. So certainly in that scenario, somebody's pouring uranium oxide dust down on you, you could envision a concentration that high.

DR. WADE: That said, it needs to be looked at and put in context, that's all.

DR. POSTON: Anything else?

MS. BLOOM: The only other thing is that report is H. K. Ferguson, not M. K.

DR. MAURO: Oh, it's H. K.? All right --

DR. NETON: Right, it's H. K. Ferguson.

MR. GRIFFON: On the H. K. Ferguson report, do you have any sense, Jim -- I know you said that you were still trying to loca-- I mean you have

some leads on this? Is this something that we might actually get before May or -- no way to -- no way to figure that out, I guess. Right.

DR. NETON: Difficult to -- to say.

MR. GRIFFON: Yeah.

DR. NETON: What we've -- what we've seen so far is there was an initial citation on -- on the OSTI database that suggested that the report was available through NTIS. We were working at it from two ends, and NTIS -- it's not available at NTIS right now, but I guess -- the inference I got was that the report may be available, but some other database holder has to release that report -- has to agree to release the report. I'm not sure why, but --

MR. GRIFFON: Okay.

DR. NETON: -- I'm -- I'm hoping that we can get it, but if not, you know, that's the way it works.

MR. GRIFFON: Okay. All right.

DR. WADE: So one thing you could do is you could pick a date two weeks out from today and say let's plan on getting together, the workgroup, on the phone. Jim can report on the Ferguson report. Mark will have had a chance,

and others, to review Cindy's report. Jim can talk about M versus S and spikes for incinerators and -- and then make a judgment. But there's something for the -- for the sake of completeness and information, Dr. Poston will not be available at the May meeting, so if the workgroup decides to bring its conclusions forward -- which I think should still be on the table -- then the workgroup members will have to decide how that would be done. You've all participated in the discussions. You're all capable people. That decision would have to be made.

DR. POSTON: Does that make sense to the working group, the members, that we'll try to find a time two weeks roughly from now to have another meeting and -- it'd have to be by telephone, I think.

DR. ROESSLER: It's good for me.

MR. CLAWSON: Yeah, that'd be fine with me, John. This is Brad.

DR. POSTON: Okay.

DR. WADE: Let's try and do it right now while we're -- all the -- the parties are here.

DR. POSTON: Get the Blackberries out.

DR. WADE: 'Cause if it doesn't happen now, it gets tough. So -- okay. So you know, you're looking at two weeks from today is the 24th of April. That's a week before the -- the Board meeting.

DR. ROESSLER: I'm clear.

MR. GRIFFON: Good for me.

MR. CLAWSON: What day was it?

DR. WADE: The 24th of April, that's a Tuesday.

DR. NETON: Morning would be better for me than the afternoon, but the day is okay with me.

MR. CLAWSON: I'm -- I'm in union negotiations, but if it wasn't going to take too long, if we could do it first thing in the morning, I could probably be able to spend a couple of hours there.

DR. WADE: Well, given your time zone, I think we could work. Is Tuesday okay for you or would you rather Monday, John?

DR. POSTON: I'd rather Monday. I have a class on --

DR. WADE: What about the 23rd? John has a class on Tuesday. The 23rd?

DR. ROESSLER: I'm clear as long as it's in the morning.

DR. WADE: Okay, so the morning of the 23rd, what if we were to say 9--

MR. GRIFFON: (Unintelligible) me, morning's good.

DR. WADE: -- 9:00 o'clock Eastern time, which is God knows what time out there in your part of the world -- are you two hours or three hours behind Eastern, Brad?

MR. CLAWSON: Two -- two hours, that'd be 7:00 o'clock my time. That'd be fine.

DR. WADE: So 9:00 a.m. Eastern Daylight Time on April 23rd for a phone call of the workgroup, and I think we know the agenda.

MR. GRIFFON: Okay.

DR. WADE: Seems like a very reasonable path forward.

DR. POSTON: Okay, we're going to say for two hours -- I'm sorry, Lew -- did you say?

DR. WADE: Well, we'll -- we'll say three hours because sometimes two hours is three hours, but no more.

DR. POSTON: Okay. At that time then what we'll do is we'll discuss the -- hopefully the H. K. Ferguson report, have further discussion on the report that was sent out yesterday by

Cindy Bloom and Jim Neton, and then decide how we're going to go forward in terms of the May meeting. If we decide to bring something to the Board, then we would need a volunteer with more experience than me since I'm -- have another commitment.

DR. WADE: Or several. Or several (unintelligible).

DR. POSTON: Anything else we need to discuss?

DR. WADE: I don't think. I think it was very productive and very focused. I appreciate everyone's time and effort, particularly your travel here, Dr. Poston. I think it was good that you were here to -- to lead this discussion.

Anything for the good of the order that needs to be said?

(No responses)

Okay.

DR. POSTON: Thanks for your time and -- talk with you in two weeks.

DR. WADE: Thank you.

(Whereupon, the meeting was concluded at 11:53 a.m.)

CERTIFICATE OF COURT REPORTER

STATE OF GEORGIA

COUNTY OF FULTON

I, Steven Ray Green, Certified Merit Court Reporter, do hereby certify that I reported the above and foregoing on the day of April 10, 2007; and it is a true and accurate transcript of the testimony captioned herein.

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

WITNESS my hand and official seal this the 12th day of June, 2007.

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STEVEN RAY GREEN, CCR

CERTIFIED MERIT COURT REPORTER

CERTIFICATE NUMBER: A-2102