Centers for Disease Control
National Institute for Occupational Safety and Health
Advisory Board on Radiation and Worker Health
TBD 6000 Work Group
Tuesday, February 4, 2020

The Work Group convened telephonically at 1:00 p.m., Eastern Time, Paul L. Ziemer, Chair, presiding.

Present:

Paul L. Ziemer, Chair
Henry Anderson, Member
Josie Beach, Member

Also Present:

Ted Katz, Designated Federal Official
Nancy Adams, NIOSH Contractor
Dave Allen, DCAS
Nancy Chalmers, DCAS
Eva DuPuis-Nouille, DCAS
Rose Gogliotti, SC&A
Cheryl Kirkwood, ORAU Team
Megan Lobaugh, NIOSH
John Mauro, SC&A
Pat McCloskey, ORAU Team
Robert Morris, ORAU Team
John Palastro
Mutty Sharfi, ORAU Team
Hugh Stephens
John Stiver, SC&A
Tim Taulbee, DCAS

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## Proceedings

(1:01 p.m.)

## Welcome and Introductions

Mr. Katz: Welcome, this is the Advisory Board on Radiation Worker Health, it's the TBD-600 Work Group, and today we are addressing just one item, Superior Steel SEC petition, 1952 to 1957.

And it's a pretty simple agenda, it's posted on the NIOSH website. We have an opportunity a little later for petitioner comments and questions, which is optional by all means.

So, we'll get around to that a little later but first, we have staff presentations, discussion, and Work Group interaction with the Staff on the status of issues, discussions, and resolution on how the work is going.

So, there's what we call a finding matrix, issue resolution matrix that is, I believe, posted on the NIOSH website along with the agenda so that folks can follow along with what the issues are, and those are described very summary form there.

The discussion should flesh that out so everybody can understand them.

So, we're going to do roll call and let me just say this preliminary note about how this Work Group is going to go a little bit.

I have some health issues that may require that I interrupt this call because I have to be present at all times while the Work Group is meeting, so at times I may have to just break the call for a bit and I will just tell everybody to sort of hold on and we'll just break the five or ten minutes and come back.

I apologize for that, there's not much I can do. And as a matter of fact, there's a couple staff people who have their own health issues and so I've asked that we at least have a break every hour.

I really don't have a sense for how long this Work Group meeting will go anyway, but should it go on for long we'll have a break every hour at the minimum, but we may need to break in a more ad hoc fashion as I may require it or as someone else may require it.

So, just be aware, and I apologize particularly to the petitioners for this if this does occur, but there's nothing I can do about it. So, having said that, then, let me just do roll call.

Since this is a specific site, speak to conflict of interest. Board Members by definition don't have a conflict with this site so that's covered.

And we have two of the Board Members on the line already, my Chair, Dr. Paul Ziemer and one of the Members, Josie Beach. They're longstanding Members of this Work Group and we'll have a third Member, Dr. Henry Anderson, shortly I'm sure.

(Roll Call.)

All right then, we'll proceed. We have two of our Work Group Members and that's good enough, and hopefully they'll join us at some point. Last thing to note, since we have a number of people who are used to coming to Work Group meetings, please, everybody, mute your phones.

The only time you should be off mute is when you're actually speaking to the group and to mute your phone, if you don't have a mute button, press *6. That'll mute your phone for this conference line, and to come off of mute you just press *6 again.

And also, please, nobody put this call on hold at any point. Hang up and dial back in if you need to but don't put it on hold because whatever background music your hold button produces, we'll get it for everything else and no one else will be able to conduct their business and we'll have to cut your line.

So, if you'll do that for me that would be great and

the meeting is yours, Paul.

## Review of the NIOSH responses for the Superior Steel Co. Special Exposure Cohort (SEC-00247) Issues Matrix

Chair Ziemer: Okay, thank you, Ted. I'm sorry to hear about the health issues but we'll see how far along we can get here.

I want to start out just by giving a brief overview of the timeline here on Superior Steel in terms of the documents that we have before us, just a reminder. The SEC petition that this is revolving around is SEC-00247.

That petition was originally received May 1 in 2018. It qualified July 19th of 2018. NIOSH issued their Evaluation Report on November 16, 2018. And the Class that was actually evaluated was all members of Superior Steel who worked from January 1, 1952 through December 31, 1957.

The NIOSH determination, or the Evaluation Report, which is based on the evaluation of workplace monitoring records and air monitoring records, NIOSH reached the conclusion that they could estimate doses with sufficient accuracy.

They issued their Evaluation Report on June 10, 2019. I'm sorry, that was the SC&A evaluation that was issued in June of 2019. The evaluation by SC&A had two findings and four observations.

NIOSH prepared responses to the SC&A review of the Evaluation Report and NIOSH's responses were issued on October 24th of this past year, 2019. And it's the NIOSH responses to the SC&A review that we have before us.

You should have a copy of the findings matrix that spells out the SC&A findings as well as the NIOSH responses, and those we want to go through today.

And I think probably our best approach here would

be for NIOSH, rather, to go ahead and give their responses. I think you've all had the SC&A review for well over six months now, and we can go back and look at specifics on the review if we need to.

But I think a good way to do this would be to start with the responses, which means that NIOSH has to, in a sense, tell us what it is they're responding to.

Am I correct in assuming, Rose, that you would lead that discussion?

Ms. Gogliotti: I certainly can. I know that Megan put together a PowerPoint presentation.

Chair Ziemer: Okay, well, whoever plans to do it, that's fine. I think, Rose, you wrote the original review, did you not?

Ms. Gogliotti: Correct.

Chair Ziemer: For SC&A? Yes, if Megan needs to lead it, that's great too. Whatever you guys want.

Dr. Lobaugh: This is Megan. I can lead it.

I have a presentation and I'll ask you, Dr. Ziemer, if you'd like me -- the presentation starts with an overview of Superior Steel again and then the ER before we get into the responses, if you'd like me to cover that as well?

Chair Ziemer: That would be great if we have that, that's great, thank you.

Dr. Lobaugh: Okay. So, I'm going to show this on the Skype, I'm going to show my PowerPoint on Skype for those of you who are online.

Ms. Gogliotti: It's posted on the website if you're not online.

Dr. Lobaugh: Yes, it is posted on the website as well.

Mr. Katz: For the petitioners, so I just understand, the Skype is not available for the public for this

meeting but you can look at the presentation online on the NIOSH website.

Dr. Lobaugh: So, like I said, I'm Megan Lobaugh and I'm going to talk about -- I'm going to go ahead to Slide 2, which is going to give an overview of the presentation I put together.

So, in this presentation I'm going to talk about a review of the Superior Steel Company, what they did, and their AEC contract. And then I'll discuss the Evaluation Report that we put together in our evaluation of the petition that we received.

And then the last section will be actually discussing our responses to the findings and observations that Dr. Ziemer mentioned.

So, I will go onto Slide 4 for those of you following along in the PowerPoint. So, this slide here is just a general review of the Superior Steel Site.

So, Superior Steel is located in Carnegie, Pennsylvania, and in the picture you'll see the five interconnected buildings that make up this facility. They had a contract with the AEC to do uranium rolling because what they did was metal rolling.

So, the covered period for this AEC contract -- well, the AWE period -- is January 1, 1952 through December 31, 1957. So, as Dr. Ziemer mentioned, that's the petition period as well, so we'll talk more about that later. There's also a residual radiation period, which means the site was not cleaned up at the end of the AEC contract. So, the residual radiation period starts January 1, 1958 and goes through to present day.

There was some clean-up at the site but the total site has not been remediated so that's why it continues through present.

Onto Slide 5, in this slide you'll see two pictures demonstrating the flow of work and the rolling stations that were used at Superior Steel.

So, in the top picture is the layout of the former Superior Steel facility showing the area designations and approximate locations of process line machinery.

So, Area C contains a storage shed and rolling area while Area A and B contain the finishing stands, roughing mill, and salt bath that we'll talk about in the next picture.

The bottom picture is a layout of the actual uranium mill operations at Superior Steel. So, the process starts on the right side of this drawing with the salt bath and proceeds through to the left side.

So, after the salt bath it goes to the mill run-out table and the roughing roll. The salt was then brushed off the plate at the brushing station and then put through the finishing stand and roll conveyor.

So, this is just to give you a visual of the full facility as well as the actual rolling areas.

Just in general, the rolling started with about a one-inch-thick slab of uranium, anywhere from 61 to 89 inches long, and anywhere from five and a half to seven inches wide.

And then it ended with a slab that was about 182 to 191 millimeters thick, so it got pretty thin.

So, just some other little information I wanted to provide here is that the slab was typically passed through the roughing roll about five times and then sent through the finishing stand before it was cut and then transferred to a cooling area.

So, that's just a real quick general overview of Superior Steel Company and now I'm going to talk more specifically about the Evaluation Report itself.

I'm going on to Slide 7, for those of you following along.

So, we received a Form B petition or an 83.13 petition on May 1, 2018 with an F.1 basis that the radiation exposures potentially incurred by the Members of the

proposed Class were not monitored either through personal monitoring or through area monitoring.

As Dr. Ziemer mentioned, we qualified this petition for review on July 19, 2018 and the Class that was actually under review is all Atomic Weapons Employees who worked in any area of Superior Steel Company in Carnegie, Pennsylvania during the period from January 1, 1952 through December 31, 1957.

I want to mention that there were no other past SEC evaluations for Superior Steel so this is the first evaluation that was done.

The documentation that was provided in support was the NIOSH Site Profile, entitled An Exposure Matrix for Superior Steel in Carnegie, Pennsylvania, Period of Operation: January 1, 1952 Through December 31, 1957.

And the petition emphasized the following statements, that individual uranium urinalysis data are unavailable for Superior Steel workers and none are known to exist, and that no external dosimetry results are available for Superior Steel employees.

So, those are two statements from the Site Profile.

Going on to Slide 8, the evaluation of the petition basis for internal monitoring. So, as I stated just before, the statement from the NIOSH Site Profile was given as support for the F.1 basis.

And in our review of this basis we provided the following information, that when personal internal monitoring data are unavailable, NIOSH uses air monitoring data from worker breathing zones and work areas in accordance with our implementation guide, Internal Dose Reconstruction Implementation Guide.

So, specifically for Superior Steel, we have air monitoring data and process data and information available to estimate uranium doses. One thing I haven't mentioned yet is that in addition to the

uranium rolling that Superior Steel did for the AEC contract, we found in our evaluation of this petition that Superior Steel also had a commercial contract or a commercial venture to do thorium rolling.

So, for thorium internal doses we proposed, or will use, airborne mass loading calculations from the uranium air monitoring data to estimate those internal thorium doses.

So, I'm going on to Slide 9 which is talking more specifically about external monitoring and our review of the petition basis for the external monitoring.

So, as I said before, the statement, no external dosimetry results are available for Superior Steel employees, was used as support for the F.1 basis and the statement, again, is coming right out of our NIOSH Site Profile that we use for dose reconstructions.

Again, when personal and area external monitoring data are unavailable, NIOSH uses workplace information so source term information, process information to estimate dose. And this is in accordance with our implementation guide for external dose reconstruction.

Specifically for Superior Steel, we would use the site-specific source term and process information in conjunction with Battelle-TBD-6000 to model both uranium external exposures and thorium external exposures.

So, here on Slide 10 is just a summary of our feasibility findings in our evaluation review for Superior Steel, SEC-47. So, we found that dose reconstruction is feasible for uranium internal doses and thorium internal doses, as well as external uranium, thorium, and occupational medical X-rays.

So, that was a very quick recap on the Evaluation Report, but what I wanted to also do, because in the Evaluation Report we provided proposed dose reconstruction methods, so I want to go through

those, again quickly before we get to the issues.

So, I'm on Slide 11 now. So, this slide here covers our proposed dose reconstruction methods. This is applicable years.

So, as I mentioned and I didn't really go into detail yet, the AEC contract really covered uranium rolling and so starting with uranium, the operations period or the contract period is June 27, 1952 through December 31, 1957 with a residual contamination period January 1, 1958 through the present.

So, that's specific to the uranium rolling that was done for AEC. As I mentioned earlier, we found evidence of thorium rolling that occurred, at least one day of thorium rolling, and for this the operations period would be March 27, 1956 through April 20, 1956.

And this time period aligns with the time of the AEC licensing for thorium work that was done at Superior Steel Company. So, because this work was done during an AEC contract period, even though it wasn't for the AEC, those doses would be covered.

So, for our post-ops contamination for thorium, this time period would be April 21, 1956 through December 31, 1957.

So, again, because this is commercial non-AEC work, the dose from thorium contamination would only go through the end of the AEC period, the AEC contract period.

So, the dates are important just to know for when these dose reconstruction methods would be applied and what time period.

So, on Slide 12 we have a summary of the proposed dose reconstruction methods for the SEC petition period, so 1952 to 1957. You'll see a table, where the left-hand column is the intake information, so we'll go through each row individually.

And then there's two columns, one for uranium and thorium. We'll go through uranium first. So, there's two different specific intake times that we're thinking about, or intake types, I would say. One is for rolling, when the actual uranium rolling was occurring, and that's the first row.

So, the proposed dose reconstruction method here was assuming a 500-hour-per-year exposure to the uranium air concentration results that we have for Superior Steel.

There is a teal box around 500-hours-per-year because this is a proposed change to the current dose reconstruction methodology. So, our current methodology, the current TBD, assigns 800 hours per year, so this is a slight reduction. Continuing with uranium but going to resuspension, the resuspension is resuspension of uranium contamination during all work processes. So this would be even when they were rolling non-uranium, when they were rolling non-radioactive metal.

So, the resuspension time period that we're proposing is 2,000 hours per year, using resuspension methods that we currently use in the program. So, the 2,000 hours per year came from the fact that we're assuming there was overtime work that was done for 2,500 hours per year.

So, the resuspension is calculated by the total hours minus that 500 hours we're assuming for rolling.

All of this material would be assessed as U-234, including recycled uranium contaminants, and this is because we know recycled uranium could have been used during this time period.

So, that's a quick summary of the uranium internal exposures and some of the assumptions that we proposed in the ER. Next, I'd like to go through the thorium column. Again, starting with rolling, given the evidence that we found of the commercial thorium rolling that was done, it appears that there was likely one day of thorium rolling.

So, we assumed ten hours' exposure during that March 1956 to April 1956 time period. Again, that March to April comes from the AEC license to be able to handle thorium. And the thorium air concentration that we would be assuming will be calculated using a mass loading approach.

So, taking the uranium air sampling results and converting to mass, and assuming the thorium mass, assuming that the mass on the air sample would be the same for thorium contamination, taking into account the difference in the two materials.

The next row here is resuspension so, again, because this is commercial work, we would only be assigning resuspension through the end of the AEC contract period, so for the remainder of 1956 through 1957.

And here the material would be assessed as thorium-232 including daughter products in secular equilibrium.

Again, I want to just point out that the teal boxes are showing proposed changes from the current TBD. So, as I mentioned for uranium, the 500 hours and 2,000 hours are changes.

The 500 hours is a slight decrease. The 2,000 hours of resuspension is actually an increase. The thorium is completely new. Currently, we are not assessing thorium at all because we did not know about the thorium rolling when the Site Profile was developed.

I'm going on to Slide 13, which covers the external exposures. So, these are the proposed dose reconstruction methods for the external exposures during the 1952 to 1957 petition period.

Again we have a table with two columns, one for uranium and one for thorium, and again here the teal boxes represent changes from the current TBD. So, here we have four different exposure types; each row represents a different exposure type.

So, starting with direct rolling for uranium, direct

rolling was that time when the uranium was actually being rolled. And here this 500-hour-per-year assumption is the same as the internal exposure time, and how we would assess that is actually using the Battelle-TBD-6000 methodology.

Currently, the current TBD uses a surrogate site, Simonds Saw and Steel, for these doses, so we thought it would be more appropriate to use the overarching guidance of TBD-6000.

For submersion rolling, this would be actual contamination that goes up into the air and causes a cloud, and this would be the exposures from that submersion of 500 hours.

So, the same exposure time as the direct rolling but here using EPA-FGR-12 methodologies.

Member Anderson: This is Henry Anderson, I'm sorry to be a little late.

Dr. Lobaugh: Hi, Dr. Anderson. The third row here -- just so you know we're on Slide 13 if you're following on your own in the presentation.

Member Anderson: Okay, thank you.

Dr. Lobaugh: So, the third row here is direct storage so this would be the time that the material was onsite but not being rolled. And you'll see a red box, this is different than before. The red box actually signifies that a change has been proposed from the actual ER proposed change.

So, we'll talk about that more when we get to the actual findings and observations. But I just wanted to point out that there has been a subsequent change from this table of information. So, the direct source that was initially proposed was 500 hours per year and again here the dose rates and methodology for calculating those dose rates would be coming from Battelle-TBD-6000.

Again, a change from the current TBD that uses a

surrogate site.

For post-rolling, this would be the time period after rolling was completed or the time period outside of uranium rolling when other metal rolling would be going on.

This assumption would be 2,000 hours per year of submersion and direct exposure, using the EPA-FGR-12 guidance.

So, going on to thorium, again, all of this thorium information would be a change from the current TBD because at the time that the Site Profile was developed we did not know about the commercial thorium work that Superior Steel was licensed to do.

So, starting with direct rolling, the proposed method would assume ten hours of direct rolling in the March-to-April 1956 time period. And here we would use MCNP modeling and distance guidance that's provided in Battelle-TBD-6000.

For submersion rolling, again, that time is the same as the direct rolling because this is just the contamination from the cloud, the cloud contamination that would occur during the rolling itself.

So ten hours, again in that same time period, again using EPA-FGR-12 guidance. For direct storage, here the hours are 190 hours in that March-to-April 1956 time period. Because Superior Steel was really only licensed to have thorium through the end of April 1956, that's how the 190 hours came to be, assuming those two months. And again, using MCNP modeling and a dose rate at one meter.

So, for post-rolling, this is again that time period outside of the thorium rolling when normal metal rolling would have been occurring so we would assume exposures for the remainder of 1956 and all of 1957, again submersion and direct exposure.

So, that was a quick summary of the Evaluation

Report as well as the proposed dose reconstruction methods that were provided in the Evaluation Report.

So, the next thing in my slides was to actually review the SC&A review of the ER. I'm not sure if, Rose, you want to introduce each issue and then I could provide the NIOSH response?

Ms. Gogliotti: I think that makes the most sense, if that's okay with everyone.

Chair Ziemer: So, before you do that -- this is Ziemer again -- let me ask if Josie or Henry have any questions to start with the Evaluation Report itself.

Member Anderson: I don't. I went over it pretty carefully but this was a good summary.

Member Beach: I just had a quick question on the thorium rolling. I went through, you guys are giving it a ten-hour day, and I know this is a Site Profile question.

I know we only did 700 pounds so it probably didn't take a full day. There would not have been any way that would have went into overtime, is there?

Dr. Lobaugh: Yes, so the information that we found says that they were requesting to receive about four ingots.

So, from what we could tell, their throughput would have been more than four per day but it's a conservative assumption to do the entire day of rolling.

Member Beach: Okay.

Ms. Gogliotti: They would have known that they could have easily processed 25 slabs of uranium a day so they're making the assumption that it was all done in one day.

Member Beach: Okay, that's what I thought. Thank you.

Chair Ziemer: Let me also pose one additional question not directly on the Site Profile issues. I know there had been I think 35 dose reconstructions completed.

I think those go back. Were those all done without looking at thorium at all? Were those all older? I don't know, Megan, if you know the answer to that?

Dr. Lobaugh: Correct, those would have all been done under the current Site Profile which does not assign dose from thorium.

Chair Ziemer: So, those automatically all are going to end up having to be looked at anyway, is that correct?

Dr. Lobaugh: Correct, so those would be --

Ms. Gogliotti: With the exception of the cases that we're already compensated.

Chair Ziemer: That's right.

Dr. Lobaugh: Exactly.

Chair Ziemer: Okay, thank you. Let's go ahead, then, with the next section.

Ms. Gogliotti: Okay, we'll start with our first finding and this really had to do with the use of Vulcan Crucible Steel billing rate data.

NIOSH had used it in their ER as well as in the TBD and there wasn't really any justification on why they felt that was an appropriate billing rate to use.

It doesn't technically meet the Board's surrogate data criteria; however, we thought it was important that it be evaluated against those criteria.

The actual review itself really only made a connection that the site was an AWE and also processed uranium metal, but there wasn't really any rationale for why that billing hour or billing rate was a reasonable substitute for Superior Steel.

It was also unclear to us how the process conditions on the site were really impacting the final price. We did a cursory review and did find another site, Joslyn Manufacturing Company, that had a billing rate of $88 per mill hour.

And if you were to use that billing rate, it would increase the number of hours by over 200 from the 500 that were in the SEC. Actually, the TBD is 800. And I can turn it over to you, Megan.

Dr. Lobaugh: Okay. So, as Rose said, we did not provide this information in the ER so in our response, we actually evaluated the billing rate that we proposed, the Vulcan Crucible billing rate of $132 per hour.

We evaluated that using the five criteria in the NIOSH implementation guide, the use of data from other facilities and the completion of dose reconstructions under the Energy Employees Occupational Illness Compensation Program Act.

So, the five criteria in there are source term, facility and process similarities, temporal considerations, data evaluation, and review of bounding exposures.

So, in our response we actually went through those five criteria and provided justification for why the Vulcan Crucible billing rate was a good surrogate billing rate for Superior Steel Company.

So, just as a reminder, the choice of this billing rate is going to affect the hours that we assign for the intake, the internal dose exposure time period as well as the external dose exposure time that we discussed before.

So, the 500 hours is coming from the use of the $132 per mill hour and actually, Superior Steel Company's contract payment for 1957, which was $54,632.

So, when you divide that out you get 414 mill hours, which we rounded up to 500 hours of rolling exposure, and again, that would be the assumption

for the intake time period as well as the external dose time period.

So, going on to Slide 16 for those following along, I'll just step through the five criteria in our implementation guide and discuss the justification for why the Vulcan Crucible billing rate would be a good billing rate.

So, in terms of source term, both sites roll uranium billets, so the source term at the sites for their AEC contracts were the same. For the second criteria, the facility and process similarities both had similar processes.

We went through specifically in the matrix, if you have the matrix in front of you. On Page 2 to 3 we went through the specifics for each of those processes.

You'll see that the steps are pretty similar, go into a heating furnace, go into a roughing roll, finishing roll, cutting, and then moving through cooling location.

And the time, the approximate time that it took to do both of these, were very similar: 75 minutes for Vulcan Crucible, 1 hour for Superior Steel, according to the documentation that we found.

So, we found that both of these sites had similar processes as well as the time it took to do it.

In terms of temporal considerations, the Vulcan Crucible billing rate that we used in the current TBD as well as propose to continue using in the ER is from 1948.

Again, the time period for this petition review was 1952 to 1957 so we considered that within the same era of operations.

For data evaluation, this is one of the criteria that doesn't directly apply because our implementation guide really discusses the review of exposure data, so what is called Type 1 data in the Board criteria.

So, this billing rate that we're talking about is really a Type 2 data which really kind of is supporting data provided, not exposure data.

So, while this doesn't directly apply, how we looked at this was reviewing what other available billing rates there were to us.

So, in this process we performed some additional data capture and made additional data requests of different facilities, different archive facilities, to review and see if there was any information on rolling, rolled uranium, rolled thorium, rolling thorium, rolling uranium. So, we used several different source terms to try and find additional billing rates. And we looked for some specific sites that we knew did rolling like, for example, Fernald, Hanford, Joslyn, Simonds Saw and Steel.

So, in this review we really found four billing rates that would fit the time period as well as the similar processes. I'll go through those here.

Simonds Saw and Steel had $110.53 per rolling hour billing rate and here, the number of mill hours or rolling hours that you would calculate using this rate was very similar or comparable to what was calculated using the Vulcan Crucible billing rate.

So, this was very similar to the 500 hours that we calculated using Vulcan Crucible.

For Joslyn, we actually have two different billing rates that were found for Joslyn. The one, the first one here listed, was $450 per rolling hour.

This was actually for a different process that required additional safety precautions, additional health surveillance, and likely that elevated number is due to the fact that these processes were different.

So, this was determined to not be a good billing rate, surrogate billing rate, for Superior Steel because of the fact that the processes were different.

The Joslyn billing rate that was mentioned in the SC&A SEC ER review of $88.03 per hour or $0.11 per pound we actually found was never implemented. So, Joslyn basically rebid, saying that they could consider a possible bid at cost plus 10 percent, which equated to $96.83 per hour.

But actually, this was never implemented and it's quoted as Joslyn but it was really for Simonds Saw and Steel, is what we found when we looked at the documentation again. So, this rate was not a good surrogate billing rate because it was never implemented.

The last one I'm going to mention here was actually in our subsequent data captures and requests that we made in response to this finding. We found the Superior Steel Company Modification Number 5 to their contract.

So, during the evaluation period itself, during our evaluation for the SEC, we did not have access to this modification at that time.

We were not aware of it, so this was found during our subsequent review, and here, we find that in that Modification Number 5 their actual rate was $1.01 per pound for the rolling itself.

And then there were some additional add-ons for additional services for inspection after pickling and before shipment to the heat treating facility, as well as an additional fee per pound for inspection of the slats before planing, and one last additional fee that could be added for beta-treating the slabs.

So, if all these additional services were provided, the total rate per pound was about $1.15 per pound. What you'll notice is the first three billing rates that we talked about were per hour while the last one is per pound.

The Simonds Saw and Steel that's listed here as Joslyn did give an $0.11 per pound -- in their discussion they talked per pound but the other three

billing rates were per rolling hour, while the Superior Steel contract actually gave it per pound.

And with that, I'm going to go on to Slide 17. So, that finished Criteria 4. We still have one more criterion that we discuss in the implementation guide and this is the review of the bounding scenario.

So, again, this criterion really doesn't directly apply because the review of the bounding scenario discussion in our implementation guide really focuses on exposure data itself, and here we're talking about a billing rate that would be used to determine exposure time, not the exposure data itself.

So, this is a Type 2, again just a reminder that this is Type 2 surrogate data.

So, for review of bounding scenario, what we looked at, what NIOSH looked at, was a comparison to other information we have.

So, we do have additional information in the Evaluation Report in Table 7-1, which is a table that lists the information that we found about rolling at Superior Steel from other sources of data.

So, this Table 7-1 was compiled from a review of SRDB documents that we have, like the typical ones you would think of. So, the HASL air monitoring data, technical reports, as well as shipping paperwork.

So, there was some customs paperwork that we saw as well as this other shipping information, so that's how this Table 7-1 was compiled.

So, it gave us usually dates of rolling or at least the time period of the rolling, the type of material typically, sometimes it gave us number of slabs or the weight of slabs, the total weight of slabs that were rolled. Sometimes it didn't give us that information.

So, Table 7-1 we felt was another compilation of information that we could use to compare this

calculated rolling exposure hours to another form of information that could tell us something about how many hours they maybe rolled uranium per year.

So, when we look at Table 7-1, depending on how you cut it and how you look at the information, we saw that this really yielded about 60 hours per year of rolling exposure.

So, using the billing rate gave us a more conservative, claimant-favorable estimate of exposure hours versus this compilation of information that isn't necessarily complete but at least gives us another idea or a picture of how many hours of rolling there was.

And again, like I mentioned before, in this review that we did, just to respond to Finding 1, we found the Modification Number 5 for the Superior Steel Company contract.

And if we look at this Modification Number 5 and do some calculations, there are additional assumptions that we have to make here. So, because the Superior Steel contract payment was written in per pound, we have to make additional assumptions on the weight of the slab as well as the number of slabs rolled per day or per year depending on how you look at the exposure rate.

So, in our response, in the assumptions that we made in our comparison, we found that, using this Modification Number 5, it was about 510 hours for the entire contract.

So, how we actually calculated that was using the entire contract payment of $356,849, assuming that that was all paid for mill time, even though we know that some of that payment was actually for improvements to their processes and their equipment.

We made the assumption that that entire payment amount was actually for rolling time and used this rolling rate of $1.01 per pound, so not including the

additional services. And you find that it's approximately 353,000 pounds of uranium that would have been rolled. And if we look at slab weights, the slab weight information that is available in Table 7-1 of the ER, you see that the slab weights really ranged a whole lot.

But if we use the overall average slab weight, average slab weight as well as assuming that they could approximately roll 25 to 30 slabs per day, that's how we ended up getting 51 days for the entire contract or 510 hours, assuming a 10-hour day.

So, that was kind of a long, drawn-out explanation but the big thing I want to point out here is the additional assumptions that we don't have much information on, so the weight of slabs and the number of slabs really rolled per day or year.

We do have that compilation and we can use that information but there's a wide variety of weight of slabs as well as the number of slabs rolled.

So, in our response, our conclusion was that we really stand by the use of the Vulcan Crucible billing rate to determine the number of hours because of the claimant-favorable outcome of the 500 hours per year that we would assume, as well as the fact that there's less unknown assumptions going into that calculation.

Ms. Gogliotti: Okay, and I think it's just important to point out here that when NIOSH did their initial ER review and when SC&A did our review of that document, there was no contract-specific information here.

It was believed that the contract was destroyed which is the reason they had to go to the Vulcan Crucible billing rate because they didn't have site-specific data. Through this process, though, NIOSH found site-specific data. They found the $1.01 per pound and I think that SC&A and NIOSH are in agreement that we can absolutely bound the milling hours at Superior Steel. But it's our position that when you

have site-specific data, you have to use it. I understand completely that this 500 hours is claimant-favorable and definitely bounding but we think in light of this information, it makes it not plausible.

And the Board's hierarchy of data criterion should take -- the actual site data should take precedence over the surrogate billing rate.

When we do preliminary calculations, which are in our Issues Matrix that we published on January 14th, we calculate an annual maximum milling hours per year of about 253 hours.

And of course, you can argue about which one you could use to calculate that. But based on that, we don't believe that 500 hours is plausible.

Dr. Mauro: This is John Mauro. I'd like to add a little bit to that.

The concept of using larger plausible bounding numbers, as you did, as compared to perhaps a lower number that is more aligned with the site-specific information, is generally okay except when you're in a mode where you're compensating people.

In other words, from my perspective looking at a number of cases, if in some places, in some sites, you use some kind of upper-end value and other cases you use more realistic values, the upper end are always -- you have a choice.

As Rose pointed out, it's always preferable to use the realistic value, especially if it's sound, in other words you're comfortable that you can rely on that number.

But it's also okay to use the -- when you have a choice. But my concern has been in the past, and this is a longstanding issue, is if you have different sites and you don't have a consistent approach between sites.

In some cases you may have a site where you -- like

in this case, you're going with a higher-end value, which is fine.

But then you run into this dilemma that you might end up compensating people there, let's say at this site, where you used more realistic values at another site. And then there's this parity issue.

I don't know the degree to which you have discussed this matter or what your opinion is regarding this matter but I thought that's something worth discussing.

Mr. Katz: Thanks, John. Let me just cut in here, I'll add a little bit to what John just said. The bottom line here is you can be claimant-favorable to the extent that you have uncertainty.

So, it is fine to calculate at a higher level to the extent that your uncertainty about the levels drive you to do so.

But to the extent that you don't have uncertainty, of course, you don't go beyond that in terms of being claimant-favorable.

Maybe that's the same as what John's saying? You don't go beyond that. And that's the limit. But to the extent that there is uncertainty and you need to deal with that by simply being more claimant-favorable, that's fine.

And that's all that I think really needs to be judged here by the Work Group and, of course, by NIOSH and by SC&A, is how far do you need to go to ensure that you're not undercutting anybody because of the uncertainties that are involved?

Chair Ziemer: This is Ziemer. John or Rose, have we received the hours that you just mentioned as an alternative set? Did we get a specific recommendation from SC&A on that?

Ms. Gogliotti: We did an example calculation that's in our January 4th Issues Matrix and that uses the

billing rate specified without any adjustments for the additional 14 and a half cents that could up the billing rate using the smallest known slab weight, 25 slabs per day, which we know has been processed in the past.

10 hours of milling per day using the highest annual billing, which was 217,000 less their reimbursable expenses that were specified in the contract of $79,000. So, roughly $138,000.

Chair Ziemer: In terms of the total time, what are the two numbers? 500 hours per year?

Ms. Gogliotti: Is what NIOSH is assuming, correct, using the Vulcan Crucible Steel billing rate.

Chair Ziemer: The SC&A's number, again, was what?

Ms. Gogliotti: 253 hours.

Chair Ziemer: Okay.

Ms. Gogliotti: So roughly half.

Chair Ziemer: Yes.

Member Beach: And then there's a note in here, Megan, that NIOSH is still awaiting responses on three data requests. Can you tell us what those entail? Is it more sites or is it specific to --

Dr. Lobaugh: So, those three that we were awaiting were requests that we made of Hanford, the archive information that was stored at Hanford, we actually have received those since then.

That information, again, was based on some key words that we chose around rolling uranium, thorium, Superior Steel Company, and those other sites that we listed in the matrix. So, like I mentioned, Fernald, some other locations that had rolling that we knew of. So, we have received results back from those searches and have not found anything additional. So, those three searches did not provide any additional information.

Member Beach: Okay.

Mr. Katz: Let me just add one other thing to this conversation about this issue. At this point, you have really two matters.

One, the SEC matter, which is feasibility, and I think what you've heard from these two staffs is they both believe in feasible reconstruction.

The question left on the table is the Site Profile issue of how conservatively you reconstruct. So, the Work Group really has two matters in front of it.

One, which we normally address first, is the SEC matter of is it feasible or not?

And the second matter, which could be addressed now or could be addressed down the road, is if the Work Group agrees that it's feasible, then it would take on the question of, well, what it is the appropriate dose reconstruction approach in the Work Group's opinion?

Which it can address as well, like I said, either at this meeting or down the road, depending on how it addressed the first question, the SEC question.

Chair Ziemer: Ziemer again. The first part of that, of course, we have, I think, agreement between both NIOSH and SC&A and that is that dose can be reconstructed.

Is there any question on that part of the issue as far as the Work Group is concerned, Josie or Henry?

Member Beach: For me, Paul, no, I don't have any questions on that aspect at all.

Member Anderson: For me, the same. We actually have two methods here, I'm probably more comfortable with using the data from the facility since you've now got it. And we're really just into assessing the uncertainty.

Is the uncertainty more than a factor of two different?

Dr. Mauro: Exactly.

Member Anderson: 500 and 250 could well be within the range. Each has different sets of uncertainty to it but I do think it sounds like it can be, to me.

And looking back over some of the other facilities, of course, we have quite a number of these types of rolling operations that have been evaluated in the past.

And I think this method, either one, works, is consistent with what we've done in the past. So, I'm comfortable saying that, again, the doses can be reconstructed for these facilities during these rolling periods.

Chair Ziemer: Well, it's clear that our Work Group has agreed on the first part of the question to the second part on what number you go with.

I, myself, am in favor of using the actual site data when you had that versus -- in fact, the one reason you can describe the discrepancy being that large, it's basically double, is the uncertainty where you go without having site data.

Your bounding ends up being bigger just because of the nature of how we do those uncertainties. But I think whenever we've had actual data, it's always what we want to go with, if possible.

But, Josie, let's get your input on this part of the question.

Member Beach: I would agree with that, although I'd like to see what the actual data is a little more specifically.

I wasn't really working on that as much as I was trying to understand the approach NIOSH was using.

Dr. Lobaugh: This is Megan. One thing I would suggest, maybe, is -- I guess I'll throw myself under the bridge -- I will or I can, if you guys would find this helpful, pull together all the data that we have in

terms of pounds and number of slabs, as well as the contract payments that we have again, because those are the big inputs to this calculation, so that we can see the variability in all those numbers and come up with something reasonable using the site data that we have.

Chair Ziemer: That certainly might be helpful.

I'm wondering at this point, is NIOSH's position currently that, in spite of having the site-specific information on the billing rate, in spite of having that, does NIOSH still prefer to go with, or are you recommending that we go with the 500 hours?

Dr. Lobaugh: So, I can speak and then maybe Tim can speak more from a programmatic standpoint.

But the information given in the response, the reason that we stuck with the 500 hours was really due to variability and uncertainty that I felt was present in the information that we had for the weight of the slabs as well as the number of slabs rolled per day or year.

Because if you look at the information in Table 7-1, it really is quite variable, so anywhere from 9 slabs up to, you know, 150 slabs in the documentation.

Now, because that documentation isn't specific to rolling, we don't know whether all the slabs were rolled over a two-to-three-day period or how many slabs are really done per day in a typical rolling operation for uranium slabs. So to me, given the uncertainty that was present and again, the variability that we saw on the data that we have in Table 7-1, the approach with the least number of assumptions was to use the surrogate billing rate.

Dr. Mauro: Megan, this is John Mauro again. I appreciate the sort of situation you're in, that is there are multiple parameters that go into making these judgments, as you pointed out.

It's not only the dollars per hour, but also the number

of slabs per hour and the time. It's almost like collectively -- and I think Ted alluded to this -- collectively you want to come down in a place that you think is reasonably bounding.

And the 500-hour number you used comes out to be a factor of 2 higher than if you go with the dollar-per-hour billing rate, but it's really the collective of information that goes into this.

And as you pointed out, if there is this collective uncertainty that you're struggling with, you don't want to always pick the worst when you're using three or four metrics or parameters to come up with a number.

You don't always want to pick the highest of each one because then you come out with a number, you're multiplying upper-end value by upper-end value, et cetera.

So, yeah, in my opinion, if I was in your shoes, I would put myself in a place where I was comfortable that, taken in its totality, perhaps the 500 hours, even though I was critical when I started this, might strike the right balance when you consider all the other parameters, as you just pointed out.

So, I'm just trying to help out a little bit here. But if you feel you struck reasonable values on all the different parameters and then you had this dollar-per-hour number that you feel comfortable with, then I think that -- you see where I'm going with this?

It's really a matter of thinking about just coming out at the right place and not necessarily coming out with an upper-end value that you say, well, this is the highest it could be, but you then run into this parity problem.

You understand where I'm going?

Dr. Taulbee: This is Tim, and I would like to just chime in here for just a moment here.

What Megan is getting at with the values in Table 7-1 of the ER there is that there's a lot of uncertainty here and I think everybody is understanding that.

And so from our standpoint, we took an approach to come up with what we were certain or quite certain that this would be an upper bound that we could estimate these doses.

We could go through and try and come up with more, better, weights per slab. I've seen ranging here from 216 pounds per slab to 500 pounds per slab. There's a factor of two just on the weight of each slab.

So, to try and sharpen this more, we just don't see that it's worth that effort but, of course, if the Work Group wants us to go through that we can certainly do so.

But if you just look at some of that variability within this, how much more do we want to try and work on this?

That's, I guess, our question back to you all.

Chair Ziemer: And Tim -- Ziemer again -- I think it sounds like if you looked at it, you actually could picture this as a distribution of possible weight distributions that give you maybe a log-normal type of possibilities.

And the upper end of that, you're saying, actually, you could have a scenario where, depending on the weight distribution, you could have the 500 hours?

Dr. Lobaugh: I don't think so.

Dr. Taulbee: Well, we don't think it would be quite that high but is it 450? You go through all of that.

It just seems like that's a lot of effort here and not much significant gain.

Member Anderson: This is Andy.

I would look at it also like our process has always

been to use existing data from a facility and now that we have it, I just don't see the overwhelming evidence that this should be ignored.

Now, whether you can rework the numbers on the estimates so that they get closer, but I would like to see it laid out a little, maybe because I'm late to the game here that there's stuff out there that I have not been able to wade through.

But I would like to see why we ought to move to -- in this case, I don't know whether this is the first time using surrogate data when there was existing data for a facility or not, for a rolling facility.

So, I wouldn't want to set a new precedent just because it ends up with a higher claimant-favorable number.

What you really want it to be is how realistic is that as an upper-bound number or is it potentially one we can't defend as well?

So, I don't know, maybe there's some data. Paul, I don't know if you have a better handle on some of this than I do, but that would be my issue.

(Simultaneous Speaking.)

Dr. Taulbee: We could go through --

Member Anderson: -- done it with the existing data unless we really have a way to show that the uncertainty in going with existing data is so much greater than the uncertainty as it's been applied to the other.

Dr. Taulbee: I believe the uncertainty, Dr. Anderson, is about equal on both ends, using the surrogate data from Vulcan versus the uncertainty that we have on the individual slabs of what we would end up with, at the end of the day.

But if your preference, if everyone's preference, is to use the site-specific data, I think that is something that we can do and we can incorporate that into the

TBD. I guess I'll just leave it at that particular point.

But do recognize that this will be -- the number that we come up with would be likely a distribution from that particular standpoint. And so that would be the number of hours we would end up using.

Mr. Katz: Let me just ask one thing before we lead this topic, and I have to cry uncle and take a break. But do we want to close the SEC finding at this point?

Because I think you've, in effect, done it but I think we should do it just formally, that SEC Finding 1. I'm not sure of its number.

Chair Ziemer: That's Finding 1, I'll call it 1A. It's that part of the issue, is the dose reconstructable with sufficient accuracy? Each of the Work Group Members has already spoken to that. We've already agreed that we could so I don't think we have to officially vote.

I can take it by consent that we've agreed to that.

Mr. Katz: Correct, I just wanted to have it stated for the record, that's all. Thanks, Paul. And you said it's 1A?

Chair Ziemer: I just called it 1A. It's the first question, first part of the first finding. The second part was the actual value to use.

Mr. Katz: Right, and that actually is a TBD issue, really, not an SEC issue.

Chair Ziemer: Yes, so that's in the delayed --

Mr. Katz: It sounds like the agreement on that is that NIOSH will go back and maybe sharpen its pencil on its use of local data and come back to the Work Group with a proposal.

Chair Ziemer: I want to make sure that we're not doing a whole lot of additional, unneeded work.

Tim, for example, said it could be a tie, for example,

450 hours rather than 250 and that was based on, I guess, just assuming a different set of rolling, right? Or what?

Dr. Taulbee: No, that was just a guess estimate, Dr. Ziemer, when you consider that the uncertainty in the slabs, from what we're seeing in the data, is ranging from 216 pounds per slab to over 500 pounds per slab.

So, when we run through all of the numbers and calculations, this could be a factor of two easily.

(Simultaneous Speaking.)

Chair Ziemer: Is it possible just to give us a few examples, just to demonstrate? That'll make it clear.

I don't want to add months and months of work to this to show what's already appeared to be pretty uncertain.

Dr. Lobaugh: This is Megan Lobaugh. I can pull that together, that information together, like the range of, the number of slabs that we're seeing rolled per day, as well as the weights that we see.

The other important information here is what contract payment we're using, whether we're using the total payment over the entire contract, whether we're using an annual payment. I can pull all that information together and provide an additional response to the Work Group with, kind of, what we're seeing when we look at this those different ways.

Chair Ziemer: I think that might be helpful for us, just to get a feel for that uncertainty and I think we need to try to resolve that.

Member Anderson: That would be helpful to me.

Chair Ziemer: They have the data available, right?

(Simultaneous Speaking.)

Mr. Katz: So, Paul is saying he doesn't want a great

level of effort here for little value and you're saying you can do that, right, Megan --

Dr. Lobaugh: Yeah, I can do that.

Mr. Katz: -- without draining the bank, so to speak?

Dr. Lobaugh: Yes.

Mr. Katz: If you all don't mind, let's take a ten-minute break, please?

(Whereupon, the above-entitled matter went off the record at 2:20 p.m. and resumed at 2:30 p.m.)

Chair Ziemer: Let's see, are we moving on to Observation 1 next? I guess we would do the second timing first, right?

Ms. Gogliotti: I think we should do Observation 1 only because it directly relates to --

Chair Ziemer: I think on your slide you had the timing first, but let's go to Observation 1, that's fine.

Ms. Gogliotti: The BRS just lists it alphabetically, that's the reason that happened.

Chair Ziemer: Right.

Ms. Gogliotti: So, our Observation 1 has to do with a different observation.

To our knowledge, we don't think that bounding the source term had been done based on contract billing in combination with another site's billing rate in the manner that it was done in the TBD or this DR review so we thought the Board needed to weigh in on this.

But, of course, if we end up using the real site data, then that should be a moot point.

Dr. Lobaugh: So, as Rose said, this was kind of thought to be a new approach.

And I just want to point out again this, since it is discussing the billing rate, is talking about the

exposure time specific to rolling hours for both the internal dose and external dose that would be assigned.

I just wanted to remind or point out that we're not using this to bound the source term but really to calculate a number of hours, so exposure time.

So, in our response, we clarify that the billing rate wasn't used for any source term assumptions.

The source term information is really coming from the AEC contract information that we have about what they rolled as well as the AEC licensing that they had for the thorium rolling they did.

So, the source term itself would be either the uranium or thorium based on the process information that we have and source documentation we have for that.

So, our response was really just clarifying that, again that we're not using this to bound the source term but to bound the exposure time.

Chair Ziemer: Thank you, Megan. This is Ziemer. Ted, just for clarity, normally on observations they don't have to be resolved necessarily in terms of action.

I guess I'm asking if you can clarify for us, do we need anything beyond this? Or NIOSH and SC&A, are you asking for anything more than this?

Dr. Lobaugh: We just wanted to make you aware that it is different than we've seen in the past.

Chair Ziemer: Right, I'm certainly aware of that. Ted, what do we need to do on this?

Mr. Katz: So, with observations you really don't need to do anything other than what you might want to, to put it that way.

So, in most cases, unless it has some issue that you want to follow up on, you can just close them out

basically and say, okay, thank you, and we're done with this.

If they lead you somewhere, of course you can go wherever they lead you.

Chair Ziemer: And in a sense, what we do on Finding 1 will address this as well. Let me ask Andy and Josie, do you have any additional questions or comments on the observations?

Member Anderson: I don't.

Member Beach: I don't either and I think that I will sort itself out when we resolve Finding 1, as stated.

Chair Ziemer: Right, very good. Okay, let's move on to Finding 2.

Ms. Gogliotti: Okay. Just as a reminder, the only uranium airborne monitoring data we have comes from four different HASL studies.

There were two from 1953 and two from 1955, and what the ER review does is it suggests breaking them into pre- and post-1955 survey distributions, and assigning everything pre-1955 to 1953, 95th percentile, and everything post-1955 to the 95th percentile of the 1955.

But when we looked at the data we found that there was insufficient evidence to support splitting the data into pre- and post-1955 survey distributions.

We felt that the May 1955 sample results might not be representative of the typical working conditions of the site, and that's because they represented a theoretically small point of time when engineering controls were reducing airborne contamination.

So, we can only definitively say that on the date of the survey those samples were low and the reductions in the air concentrations seen, there was an introduction of man-cooling fans as well as additional ventilation.

But we think that was largely offset by the slab brushing that was instituted in September 1955.

So, lacking additional evidence of the engineering controls that were implemented and when they were done, we didn't believe that there was enough evidence to support the pre- and post-1955 distributions.

Dr. Lobaugh: So, in our response, the NIOSH response to Finding 2, we performed hypothesis testing on the data sets to see whether these data sets were from the same distribution or not.

So, what was found was that the May 1955 data was not from the same distribution. We did not do testing to tell whether it was higher or lower, it just told us it was not from the same distribution.

Visually, when you look at the visual plots of this data, it does look lower. So then our proposal was to basically remove the May 1955 data from the intake analysis and use only the three other data sets to determine intake rates for the entire exposure period.

So not parse it out as originally proposed but to just use the three data sets to determine the uranium intake rate, which then would also feed into the thorium intake rate by doing the mass-loading calculations.

Mr. Katz: Someone on the line isn't muted. So, the only person who should not be muted at this point is Megan, who's presenting. If you don't have a mute button, please press *6 because it's getting to be pretty noisome listening to the interference. Thanks.

Ms. Gogliotti: Okay, and based on NIOSH's response, they basically agree with our suggestion to remove the May 1955 sampling data and combine the remaining three samples.

So, we recommend accepting that modified approach.

Chair Ziemer: Okay, let's get input from the Work Group on that, or questions or comments? Go ahead, Josie.

Member Beach: I agree with that assumption. I did want to point out, I think, Megan, on Page 10 of the matrix -- oh, wait, this is SC&A.

There is a typo I believe on the first bullet, the May 1953, that says, therefore, they're using 19 samples from the May 1955 data set.

Is that correct or should it be '53?

Dr. Lobaugh: Yeah, it should be May 1953.

Member Beach: Okay, I just wanted to verify that. And I agree with this, removing the May data for 1955.

Member Anderson: I don't have any problem with that. Good pick-up on the typo there, Josie.

Chair Ziemer: So --

(Telephonic interference.)

Mr. Katz: Paul, you're breaking up. I'm sorry, Paul, your voice isn't coming through. I don't know if it's a speakerphone but your voice isn't coming through.

Chair Ziemer: I took it off speaker, can you hear me now?

Mr. Katz: Yeah, that's perfect.

Chair Ziemer: Okay. I just wanted to ask --

(Telephonic interference.)

Mr. Katz: You're breaking up again. Sorry, Paul, we couldn't hear what you said.

Chair Ziemer: I'm just going to move to a different spot. Can you hear me? Are we good?

Mr. Katz: Right now you are, yes.

Chair Ziemer: Okay. Is there reason to believe that the data actually is -- is different but if you look at the data --

(Telephonic interference.)

Mr. Katz: Paul, every other word of yours, just now in the question again, was lost. You're going to have to restate it, Paul. Again we lost you.

Chair Ziemer: It must be the Lafayette weather. Is there reason to believe that the data set is actually not good? Obviously, it's a different data set, it's from a different year. But is there reason to believe that it's invalid?

Dr. Lobaugh: So, as Rose kind of mentioned, what we found in the reports from HASL was that there's some indication that they were trying to use increased ventilation, additional fans, man-cooling fans and things like that, to try to decrease the airborne contamination.

Other than that, that's really the only information we can find that would lead us to believe why this data is different from the other data sets.

Dr. Taulbee: Paul, if I could interject here just a little bit, to state it another way, they were doing some experimentation to, as Megan said, try to reduce the airborne levels, trying different things, engineered controls, and there's no indication that those continued on past that date.

So, they were doing sampling during a particular rolling, trying out some new things, and there's no indication that it continued or was prior to that particular rolling.

Dr. Lobaugh: The other thing Rose mentioned, too, was that they instituted brushing because there was some salt left on the slabs themselves and so they instituted this brushing at some point, which could have, even if they continued ventilation, could have increased the airborne contamination, again, by

brushing the slabs after rolling.

Chair Ziemer: Okay, thank you.

Dr. Mauro: Megan, this is John Mauro. This is a question I always ask myself when I have real data at AWE sites.

We rely very heavily all the time on TBD-6000 and the look-up tables, and one of the things that always interests me, and of course it has no direct bearing here so I apologize if I'm --

(Simultaneous Speaking.)

Mr. Katz: John, can I just interrupt now, though?

Dr. Mauro: Sure.

Mr. Katz: Because in this case the Work Group's already opined on this one.

Dr. Mauro: Never mind, I withdraw. You know where I was going.

Mr. Katz: I'm just trying to hang in here.

Dr. Mauro: Okay.

Mr. Katz: I'm sorry.

Dr. Mauro: That's okay.

Chair Ziemer: So, I think the Work Group has agreed to this proposed solution that NIOSH has given, SC&A's agreed to it.

I'll take it by consent that we'll remove the May 1955 data and use the other three data sets for the intake rate for the entire exposure period. Is that agreed to?

(Chorus of yes.)

Chair Ziemer: Okay, thank you.

Mr. Katz: Great.

Chair Ziemer: I think we're ready for Observation 2.

Ms. Gogliotti: Okay, for Observation 2 our initial observation was that there was a sound basis for the use of some fraction of uranium concentrations as a basis for thorium concentrations when there is no thorium monitoring.

However, we noted that the one-to-one ratio could be important for consistency purposes between this site and other sites and the ratio was very claimant-favorable.

And, of course, the bearings on Finding 1, for Finding 1 being resolved would also impact this issue of the amount of thorium.

Dr. Lobaugh: So, in our review of this Observation 2, we just wanted to clarify that the main difference that we're seeing here, as we mentioned in the ER and mentioned here in this slide presentation that you can see, this mass-loading approach was actually used at Bridgeport Brass.

And at Bridgeport Brass the thorium intake rate was equal to ten percent of the uranium intake rate.

So, the question was, well, how come we're using a smaller number, ten percent, versus one-to-one for Superior Steel, which we're assuming?

So, one major difference between Bridgeport Brass and Superior Steel was that the uranium and thorium were rolled concurrently, meaning on the same day using the same processes. So, there might be a uranium slab going through and thorium after it, and the air sampling would be done during both of those rollings. So, the air sampling would maybe be run during the whole day.

So, the air sample itself could have both uranium and thorium on it, the filter itself could have both uranium and thorium on it. So, when it was counted, that gross alpha count would have results for both uranium and thorium.

So, the major difference in Superior Steel is that the

air sampling we would be using was from air sampling that was done only during the uranium rolling.

So, the four HASL air sample results that we just discussed were only done during uranium rolling and we have no evidence that there was air sampling done during the thorium rolling.

So, the one-to-one approach here is because we're assuming that the mass loading on the air sample itself, so the amount of material that would be sucked through the filter would be the same regardless of what material was rolled when we make corrections for the differences in materials as well.

So, the one-to-one that seems different from Bridgeport Brass really is because we don't have a concurrent result, basically.

We don't have a uranium and thorium result for an air sample where we need to make some sort of assumption on how much of that air sample result is uranium versus how much is thorium.

Here, we know the air sample result is all uranium.

(Simultaneous speaking.)

Ms. Gogliotti: We understand the need for the ten percent assumption at Bridgeport Brass and why that's not applicable to Superior Steel, and that's simply because they were not processed simultaneously.

And I'll point out that all of the HASL studies were done prior to the thorium licensing so there's no possibility they contain any thorium. And based on that, we recommend closing this observation.

Chair Ziemer: Okay, comments, Board Members?

Member Anderson: No, I don't have any.

Member Beach: I didn't have any questions or comments and I agree with that.

Member Anderson: It's good to have the expanded explanation, though.

Chair Ziemer: I think we agree we can close this one.

Dr. Lobaugh: Okay, great.

Ms. Gogliotti: The next observation is Observation 3, it has to do with the storage time. I'll just read it for you here.

SC&A finds this storage time assumption to be inadequate to capture the length of time the material was likely found on site. If the site milled uranium metals for 500 hours per year, then it is reasonable to assume 10-hour milling once per week.

For the 250 pre-rolling and post-rolling hours assumption to hold true, uranium metals would have to arrive on the day prior to rolling and be shipped off the day following rolling.

And when you look at Table 7-1 in the NIOSH SEC ER, it shows that the site roughly had more than a day's rolling inventory on site. And during the April 2019 Board Meeting the petitioner indicated that the scrap materials was stored on site for extended periods of time.

Mr. Katz: Excuse me, someone's on the line and is whistling and humming. Can you please just mute your phone? Press *6 to mute your phone. Thanks.

Dr. Lobaugh: For our response to Observation 3 we did agree, given the petitioner's comments and our additional review of the reference documents that we have, that this exposure time needed to be changed from 500 hours.

So, the proposed change was to year-round, so assuming the total of 2500 hours' exposure minus the rolling time for the entire operational period.

So, assuming that the material could have been on site throughout the entire operation period.

Chair Ziemer: Thank you. I assume, SC&A, you're good with that too?

Ms. Gogliotti: I just want to point out that however we resolve Finding 1 will also impact this because you're minusing the rolling time, or subtracting the rolling time.

But we, other than that, find the proposed approach to be consistent with the likely conditions on the site and we recommend closure.

Member Beach: This is Josie. Paul, I appreciate NIOSH's responsiveness to the petitioner's comments and I agree with this, to close it.

Member Anderson: I would agree with that.

Mr. Katz: Paul, are you there? Maybe you're on mute, Paul.

Member Anderson: Whistle if you're still there, Paul.

(Laughter.)

Mr. Katz: We had whistling before but it wasn't Paul.

Member Anderson: No, I know.

Mr. Katz: It sounded like he was having some phone problems, he might have just lost his connection there. He could be dialing back in.

I don't think we'll find him here, we'll get him back. It could be that he's talking to us and doesn't realize we don't hear him, in which case this would be a clued-in call.

Member Beach: I don't think there was that much to say. He's probably calling back in.

Mr. Katz: Yeah.

Member Beach: Hopefully.

Chair Ziemer: Well, my phone just dropped the call. So I'm back now.

Mr. Katz: Welcome back, Paul.

Chair Ziemer: I hope you closed that final observation.

Mr. Katz: They did, actually. I don't know, where did you lose connection, at what point in the discussion?

Chair Ziemer: Just when I said we're ready to close on the observation.

Mr. Katz: Okay, perfect.

Ms. Gogliotti: All right, so we can move on to Observation 4.

Chair Ziemer: Right.

Ms. Gogliotti: And this has to do with medical examinations on site.

NIOSH was proposing to assign an annual medical X-ray every year, basically, and we of course find that very claimant-favorable but we question the decision to assume an annual medical examination in spite of the lack of evidence that there were, in fact, medical X-rays performed.

Just a reminder: the CATI reports don't indicate that anyone thought that they had X-rays, but historically people worked there over 50 years ago and there were very few claimants that were still alive.

We just pointed out that in recent years the Board has made a concerted effort to improve consistency between sites and it was unclear if all AWE sites with no evidence of examinations received the same claimant-favorable assumptions.

Dr. Lobaugh: In our response -- this is the NIOSH response. In our response, we pointed out that the proposed assignment of a pre-employment annual and termination PA chest X-ray dose was in line with our default assumption from OTIB-6.

When evidence is lacking, we assign the pre-

employment, annual, and termination PA chest X-rays. And it also falls from our default assumption from ORAU, OTIB-79 when evidence is lacking.

So, 79 tells us what to do, whether X-rays were taken on site or off site and so when the evidence is lacking we assume the X-rays were given on site and, therefore, the dose is included.

So, the TBD currently follows this and the ER continues that approach, basically.

Chair Ziemer: And this is basically consistent with existing policy?

Dr. Lobaugh: Yes.

Chair Ziemer: So, the assignment was made. And I think on that basis, we don't need any action. You've justified why you've done it and I think let's close the observation.

And SC&A, you're okay with that too, I assume?

Ms. Gogliotti: Yes, we did do some cursory reviews just to double-check that.

We were aware of the guidance of OTIB-6 and OTIB-79 but we were more concerned with was that being consistently applied over 200 AWE facilities.

So, to investigate, just a really cursory look, I sampled ten AWE reviews that we already completed for the Subcommittee of Dose Reconstruction Reviews and found that all of those reviews were consistent.

However, many of them were overestimating claims, which would typically assume an annual scan for efficiency anyway.

But we didn't want to do a bigger scan or a bigger review of that because I think that would really require additional tasking.

Based on that, we feel satisfied, unless the Board was

interested in a more detailed review.

Chair Ziemer: I think at this point for this Work Group, we just deal with this. Any questions or comments, Board Members?

Member Anderson: No.

Member Beach: No questions.

Chair Ziemer: Okay, I think we're good on that, we agree that closes Observation 4. I think that's it. Is that it?

Dr. Lobaugh: Correct.

Petitioner Comments/Questions

Chair Ziemer: So, we've closed everything but we have an open question on Finding 1 and NIOSH is going to follow up on that and give us some additional information for future consideration.

So, Ted, I think we're ready to hear from the petitioners at this point.

Mr. Katz: Right, so petitioners or a petitioner's representative, whoever their pick might be, if you would like to comment in any way or have questions, now is the time.

Mr. Stephens: This is Hugh Stephens, I represent the Palastros, who are the petitioners in this case, and we helped them file the petition.

We believe that there is significant uncertainty and we know that based on a review of Table 7-1. I think there are 49 rows on that spreadsheet and of those, 10 of them have no indication of the number of slabs or the number of pounds.

So, that was a significant amount of uncertainty. I think we talked about the idea that there's no real indication relative to how much these slabs weigh. We know some of them were heavy and some of them were light.

So, the usefulness of a number of slabs is certainly not without uncertainty. And in fact, the uncertainties, as someone mentioned earlier, are multiplied against each other and it creates enormous amount of uncertainty.

And we know that because NIOSH and SC&A both agreed early on in this process that $54,000, somewhere between $40,000 and $54,000 was the average of all of the years.

And then later on we found some site-specific data and we learned that was an underestimate, and that the real estimate for 1956 was approximately three times that estimate. It turned out to be $138,000 instead of somewhere between 40 and 55. So, we had a level of uncertainty where the idea was that the upper bound was somewhere in the $40,000 to $55,000 range and it turned out to be $138,000.

So, I think when we were talking earlier about how these uncertainties can lead to an uncertainty level of two times, I don't think anyone should have any difficulty finding that in this record.

Now, obviously, I represent a claimant whose claims have been denied. We'd like to see a Special Exposure Cohort. We think that the level of uncertainty here would warrant a Special Exposure Cohort.

We seem to be the minority in that regard and we're sensitive to that. But I did just want to quote a little bit from Page 30 of 55 of the Petition Evaluation Report: however, the payments for the other three years were all consistently in the range of $40,000 to $55,000 based on the rolling data presented in Table 7-1. NIOSH has no indication that the production rate for fiscal year 1956 was significantly different than the other years under evaluation.

And then in the Superior Steel Special Exposure Cohort Issues Matrix dated January 14, 2020 on Page 7, it turned out that the highest billing year, 1956, there was $138,246 which represented $217,246

less $79,000 estimated Schedule A reimbursement expenses with no credit taken for the slab furnace.

So, I think one of the issues, this is kind of a moving target because we kind of get this information a little bit digested and we do our best to understand what we have here but it does appear that lots of information has been developed over the course of this process.

And we'd love to have access to that, I'm not sure if we can have access to it but we would like to have access if that's possible. So, that's just one issue that we identified as showing that there's a significant level of uncertainty here that we believe meets the SEC criteria, which is insufficiently accurate.

We think this is a reasonable method of performing dose reconstructions but it also can be described as sufficiently accurate in a claimant-favorable program like this one.

And the other issue that we have is with respect to this sampling. There's another facility I believe in western York where certain measures were implemented to reduce the amount of airborne contamination.

And we have that here, it appears, but then it sounds like there were other issues that caused, the brushing I believe caused, the exposure to go up.

So, while the exposures decreased, they also increased. I think this also shows a level of uncertainty. And the sampling is done in years where the level of processing is much lower.

1956 is the year when they're doing the most processing and yet there's no sampling during that year.

In any event, these issues, the novel use of surrogate data, we are troubled by all of these issues and believe that a Special Exposure Cohort should be established.

But in light of NIOSH and SC&A, who all appear to be in agreement, there's no need for Special Exposure Cohort here. We just have to agree to disagree on that.

But with respect to the level of uncertainty, we think it rises to the level of a Special Exposure Cohort.

But one way or another, this idea that we have enough information to reduce the number of hours to 250 seems a gross underestimate of the level of uncertainty that we're dealing with, at least to us.

And with that, I'll ask if Mr. Palastro -- John Palastro is on the line and I'll ask if he has any comments to add.

Mr. Palastro: Yes, I do in a couple areas. One is the storage of scrap. They would have a train car in there and it couldn't leave until it was full.

So, they probably put all types of scrap in there. The other one is that uranium is run on a conveyor and there's a certain amount of shale that falls off of it and it falls through the conveyor, and that stays there until it's time to clean out under the conveyor.

And I can't tell you how often they clean down there but I know it wasn't every day. It was probably once a month. And there's residual radiation that would have been in the mill all the time.

I also want to tell you one other thing. When it goes to the shears, there wasn't some automated machine that puts the crop in there if it's uneven when it's rolled.

It was a roller that pulled it off with a big pair of shears and stacked it up, and that stack was sitting there pretty close to them all along while they were rolling out the steel and once it got full they came over and took it and put it in the cart, which stayed right there. So, you've got a lot of radiation there that I think you forgot about.

That's all I have to say.

Path Forward

Chair Ziemer: Okay, thank you, Hugh and John, for those additional comments, particularly the concern about uncertainty. We'll be visiting that issue on the number of hours from our discussion.

So, that will be on down the line when we get that additional information back from NIOSH. I want to look here at the path forward. Ted, I understand we need to go to the Board on the petition action?

Mr. Katz: We do. There's not a whole lot of work left for the Work Group really.

The remaining issue on hours is a TBD issue and it sounds like it can get reported out to you in pretty good time, and I think they could really probably report out to you in a White Paper or memo to you and then we'll discuss that at the Board Meeting.

I think it's probably reasonable to expect this would be ready for the April Board Meeting to be on the agenda, unless you have any concerns about that.

Chair Ziemer: We could certainly bring to the Board Action on the petition itself at the Board Meeting.

Mr. Katz: Yes, we haven't made a motion on the petition in its entirety but you've made a motion basically that's feasible so you've made a motion that corresponds to the findings that would have been related to our basis to add a Class.

Chair Ziemer: If we need to formalize that, I'll simply ask the Subcommittee if we could have a motion to recommend to the Board that the SEC be denied.

Mr. Katz: Or just a motion that dose reconstruction is feasible for the period in question.

Chair Ziemer: What's the correct motion for the Board?

Mr. Katz: That you concur with NIOSH's recommendation that dose reconstruction be found to be feasible for the period covered by the petition.

Chair Ziemer: Will somebody so move that?

Member Anderson: So moved. This is Andy.

Member Beach: Second.

Chair Ziemer: Okay, thank you. Any further discussion for the Board Members? Okay, Henry, you moved it, Josie seconded it?

Member Beach: Yes.

Chair Ziemer: Okay, you're both voting aye?

Member Anderson: Yes.

Member Beach: Yes.

Chair Ziemer: It's been moved and seconded and I'll vote aye, so we have a motion for the Board. Thank you.

Mr. Katz: And Paul, I guess the last thing I would ask is what's the lead time for this? I don't know if it would be good for either SC&A or Megan to prepare a presentation. Megan, you prepared the presentation for this. Whatever your preference is in this case.

Often, SC&A prepares the presentation but you've already prepared the presentation for this so whatever your preference between the two of you.

Chair Ziemer: I think it would be probably simple for NIOSH, Megan, you could make the presentation based pretty much on what you covered today, right?

Dr. Lobaugh: So, I should point out, I will be able to prepare the presentation.

I don't know that I will be able to -- well, I know I will not be able to travel to the Board Meeting because I'm expected to have a baby in April. So, I

won't be at the meeting but I think someone could present on my behalf, if you would like NIOSH to present.

Mr. Katz: Or Paul, you often do your own presenting for these. It's up to you.

Chair Ziemer: If Megan's in agreement, I'll utilize what she has and prepare something from that.

Mr. Katz: I think Megan could prepare it for you and --

(Simultaneous Speaking.)

Chair Ziemer: Are you okay with that, Megan?

Dr. Lobaugh: Yes, that's fine with me.

Chair Ziemer: Okay, let's do that.

Mr. Katz: That sounds great. And then, Megan, please, run that by Rose so that she has a chance to review it.

And copy the Work Group when you do that and the Work Group will have a chance to review that presentation too.

Dr. Lobaugh: Great, will do.

Mr. Katz: And again, there's lots of time for that, there's no rush on that because we'll talk about April 22nd Board Meeting.

Chair Ziemer: It's almost three months.

Mr. Katz: Yes. We're hardly ever this well prepared. Paul, I think we're finished today with today's meeting's business.

Thank you, everybody, and a special thanks to Hugh and John for joining us for this meeting, and I'm sure you'll want to join us in April for the Board Meeting.

Paul and Josie and Andy, could you call back in on this line in about five minutes?

Chair Ziemer: Sure.

Member Beach: Yes.

Mr. Katz: Okay, thanks.

Adjourn

Chair Ziemer: Thank you, everybody. We'll declare the meeting adjourned.

(Whereupon, the above-entitled matter went off the record at 3:13 p.m.)