

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

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ADVISORY BOARD ON RADIATION  
AND WORKER HEALTH

+ + + + +

KANSAS CITY PLANT WORK GROUP

+ + + + +

FRIDAY  
JULY 17, 2015

+ + + + +

The Work Group convened in the Hampton Inn Cincinnati Airport-North, 755 Petersburg Road, Hebron, Kentucky, at 9:00 a.m. Eastern Time, Josie Beach, Chair, presiding.

PRESENT:

- JOSIE BEACH, Chair
- BRADLEY P. CLAWSON, Member\*
- JAMES E. LOCKEY, Member
- JOHN W. POSTON, SR., Member
- LORETTA R. VALERIO, Member

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## ALSO PRESENT:

TED KATZ, Designated Federal Official  
BOB BARTON, SC&A\*  
RON BUCHANAN, SC&A\*  
PETE DARNELL, DCAS  
JOE FITZGERALD, SC&A  
JOYCE LIPSZTEIN, SC&A\*  
JOHN MAURO, SC&A\*  
PAT MCCLOSKEY, ORAU Team  
JIM NETON, DCAS\*  
MUTTY SHARFI, ORAU Team

\* Present via teleconference

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Josie Beach..... 136

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

(9:04 a.m.)

1  
2  
3 MR. KATZ: Okay. Good morning,  
4 everyone. We're still awaiting Dr. Lockey, unless  
5 he joins us by phone. We expect him here, but we  
6 are going to get rolling here.

7 So, this is the Advisory Board on  
8 Radiation and Worker Health, the Kansas City Plant  
9 Work Group. And this is second day of a two-day  
10 meeting.

11 Yesterday we heard from Wayne Knox and  
12 went down a large list of his issues. And today  
13 we have a fairly full agenda of issues being worked  
14 through by the Work Group.

15 The agenda for today and papers related  
16 to the agenda today are posted on the NIOSH website  
17 under the Board section, schedule of meetings,  
18 today's date. So, anyone on the phone can look  
19 there and all those documents should be PDFs that  
20 you can open and follow along with the discussion.

21 We will do roll call in a second. The  
22 other thing I would just like to note before --  
23 well, I'll wait until we have done roll call and

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1 we are formally in meeting.

2 So, roll call, we are speaking a  
3 specific site, so any Agency-related people,  
4 please speak to conflict of interest as well.

5 (Roll call.)

6 MR. KATZ: That takes care of roll  
7 call. Let me just ask everyone to mute their  
8 phones, except when you're addressing the group,  
9 for the audio call or the conference call. If you  
10 don't have a mute button, \*6 to mute your phone,  
11 \*6 to take your phone off of mute.

12 Yesterday Mr. Knox had raised an issue  
13 about whether GSA employees at Kansas City Plant,  
14 some of them should be considered contractor or  
15 subcontractor employees to GSA. And the main  
16 point of that discussion response was that that is  
17 not a determination that's made by the Board or by  
18 NIOSH. It's a DOL matter.

19 Then I said in that discussion that  
20 federal agencies are not contractors to other  
21 federal agencies. Someone kindly wrote in from  
22 the public that DOL has designated other federal  
23 agencies within the Department of Interior as

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1 contractors to DOE at other facilities, and Nevada  
2 Test Site was one example given, I think Savannah  
3 River another. So, I don't know about that, but that  
4 may be true. I'm not aware of it, but that still  
5 remains a DOL matter, not a Board of NIOSH matter.

6 But I wanted to put that on the record.  
7 I may be incorrect. It may be that federal  
8 agencies can be designated as contractors or  
9 subcontractors in this program. And I wanted to  
10 make that clear.

11 And that takes care of my business.  
12 Okay, thank you. Josie.

13 CHAIR BEACH: Okay, thank you. So, I  
14 am wondering, for those of you on the phone and in  
15 the room, if it would be okay if we started with  
16 Issue 13, the mag-thorium issue. I talked to Pete.  
17 He said that was okay. Any objections, anybody?  
18 Joyce, does that work for you?

19 DR. LIPSZTEIN: Hello? I'm sorry.

20 CHAIR BEACH: Hi, I'm just wondering.  
21 I was thinking we should go ahead and start with  
22 Issue 13, the mag-thorium issue. Are you prepared  
23 for that to start?

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1 DR. LIPSZTEIN: Yes, yeah.

2 CHAIR BEACH: Okay. So, we had a  
3 couple of different White Papers exchanged: SC&A's  
4 White Paper of May 2015 and then we have NIOSH's  
5 response. Both of these are posted on the website,  
6 as Ted indicated. Do you want to start with issues  
7 from the SC&A side and then go to NIOSH?

8 MR. FITZGERALD: Yes, I think in this  
9 particular case, that would be appropriate.

10 CHAIR BEACH: Okay.

11 MR. FITZGERALD: We had a couple of  
12 different issues. I really want to defer to Joyce  
13 who has actually authored the White Paper. But  
14 mag-thorium has had a fairly long history in the  
15 Work Group of research because there was so little  
16 specific monitoring data for thorium. And so a lot  
17 of the effort was just trying to pinpoint the  
18 timeframe, locations, and source term for that  
19 particular operation, from the late '50s up through  
20 the late '70s.

21 And I think we've actually made steady  
22 progress throughout that time. And I think we are  
23 at the point now where we've identified pretty much

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1 what information is available and I think we have  
2 refined the method, or methods, to a point where  
3 it is a lot clearer than it was maybe even a year  
4 ago.

5 So, this last White Paper that Joyce  
6 will walk us through really was pointing to what  
7 we felt were remaining gaps or areas of  
8 clarification that we were hoping that we could  
9 bring before the Work Group in terms of NIOSH's  
10 response.

11 We just received NIOSH's response this  
12 past week and I think it was just posted a few days  
13 ago. So, we don't have anything more than our  
14 reaction to it, but I think over the last couple  
15 of days we have been able to digest it and I think  
16 we're prepared to talk about it before the Work  
17 Group. So, I think we're in reasonably good shape.

18 Joyce, maybe the best way to do this is  
19 if you could catch us up in terms of where we left  
20 off at the last Work Group meeting in March, and  
21 maybe just go through the essential issues that we  
22 raised in this last White Paper of May of this year.  
23 And then we can turn to NIOSH in terms of their

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1 response to that White Paper.

2 DR. LIPSZTEIN: Okay. I will begin by  
3 repeating what Joe already said. That NIOSH  
4 posted the response to our White Paper and I only  
5 saw it posted yesterday morning. But we have,  
6 SC&A, we have reviewed NIOSH's response to our  
7 concerns, and although it was a fast review but  
8 reviewed all the documents that NIOSH had in their  
9 response. And I must say we are satisfied with  
10 most of NIOSH's responses.

11 So, I'm going now to explain all the  
12 concerns that we have posted in our May 2015 White  
13 Paper.

14 The first thing is the start of the  
15 mag-thorium machining operation at the Kansas  
16 City. SC&A agreed with NIOSH's revised  
17 information that KCP's magnesium-thorium  
18 machining was performed offsite by subcontractors  
19 from May 1, 1957, until August 1961 and not at the  
20 Kansas City site itself.

21 So, according to NIOSH, mag-thorium  
22 machining operations at Kansas City Plant actually  
23 began on August 23, 1961. And SC&A is in agreement

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1 with the documents NIOSH has presented.

2 Second of our concerns was the location  
3 of the mag-thorium machining. First, they  
4 mentioned several departments on the location of  
5 the mag-thorium machining. So, the machining of  
6 mag-thorium first took place in Department 22. In  
7 October '65, Department 22 changed its name to  
8 Department 20D. So, whenever it is Department 22  
9 and Department 20D, they are the same department.  
10 They just changed names. But after August 1970,  
11 mag-thorium machining took place in another  
12 department, which was called the model shop. So,  
13 mag-thorium machining was moved to the model shop  
14 in 1970.

15 Now, about the bounding limit that  
16 NIOSH posted, which is  $3E-11$  microcuries per  
17 milliliter. SC&A agrees with NIOSH on the  
18 application of this bounding value for thorium  
19 exposures in the machining work for the periods of  
20 time and locations where this limit was enforced.  
21 The application of this limit depends on NIOSH  
22 being able to corroborate for relevant operational  
23 time periods and locations that this limit was

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1 bounding of air concentrations to which  
2 mag-thorium machining workers were exposed.

3 So, let's go to the period 1961 to 1963.  
4 From the period August 1961 to 1963, it is clear  
5 that there are gross alpha monitoring data for the  
6 location in question, which is Department 22, and  
7 mag-thorium and DU operations were co-located.  
8 So, SC&A agrees with application of the bounding  
9 limit to this time period.

10 For 1963 to 1966, we still need some  
11 information regarding the mag-thorium machining  
12 workload in concert with co-located DU operations.  
13 Because what happens is NIOSH was using this limit  
14 at this building, but this limit was enforced based  
15 on the DU machining. And if DU machining was done  
16 at the same time or in the same location as  
17 mag-thorium machining, using the same machines,  
18 then we can apply the results for the DU air  
19 sampling to thorium. If not, we cannot apply the  
20 limit.

21 For the 1966 to 1970, the information  
22 remains lacking regarding the location, the  
23 specific timeframe and workload for mag-thorium

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1 machining during this period.

2 Department 20D, where the DU machining  
3 took place until 1966, started to be decontaminated  
4 in that year and was likely not used, in whole or  
5 part, for mag-thorium machining. So, this is  
6 problematic, given that NIOSH makes use of DU area  
7 air samples and surface smears for Department 20D  
8 to show that the limit was achieved in the  
9 mag-thorium operation, without knowing whether  
10 those operations had been relocated relative to  
11 these monitors.

12 I have to say that when NIOSH is going  
13 to discuss their responses, I just reviewed it,  
14 that they review the information from 1963 to 1970.  
15 This is the new paper that was posted yesterday,  
16 and certainly NIOSH to tell this again, but I just  
17 want to say that those two locations from 1963 to  
18 1970, NIOSH has determined that mag-thorium  
19 operations were suspended in 1963 and did not begin  
20 again until August 28, 1970. And we saw the  
21 documents they had presented. We think that their  
22 conclusions are probably correct, although there  
23 was a fire in 1963. But as the limit is going to

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1 be used for this period with probably no  
2 mag-thorium operation -- I don't know, that is for  
3 NIOSH to answer, if they are going to use this limit  
4 for the 1963, the whole period, 1963 to 1970 period.

5 Okay, now let's go to the 1970 to 1979.

6 MR. MCCLOSKEY: Joyce, may I interrupt  
7 for a second? Did I just hear you say the word  
8 "fire" or did I mishear?

9 DR. LIPSZTEIN: Yeah, there was a fire  
10 in 1963 that I saw in one of the documents that  
11 actually NIOSH referred to.

12 MR. MCCLOSKEY: And then you went on to  
13 say that causes you to wonder how NIOSH is going  
14 to apply the 3E-11 from '63 to 1970. Is that --

15 DR. LIPSZTEIN: Yes.

16 MR. FITZGERALD: I think the confusion  
17 -- Joyce, wasn't that fire in '64?

18 DR. LIPSZTEIN: In '64, yes.

19 MR. FITZGERALD: Yeah, I think there  
20 was some incident involving a pyrophoric magnesium  
21 fire that she's referring to. And I think it is  
22 just a question for clarification, if in fact that  
23 was the case, you know, if there was in fact

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1 exposure. And I think that is the important  
2 aspect: What would be applied to that exposure in  
3 '64 for that one incident?

4 Of course, it also begs the question,  
5 if there was a fire, does that mean there was  
6 residual mag-thorium on the premises that might  
7 have been involved or not.

8 MR. MCCLOSKEY: Yeah, we're not going  
9 to be able to respond to that today. It'll  
10 probably sound like, what Joe just said, that we  
11 are going to need to think about how that fire will  
12 be handled, because I need to see that SRDB  
13 reference again and review that fire.

14 MR. FITZGERALD: Yeah, I recall the  
15 incident, but I don't recall it being '64. If it  
16 was '64, then it'd be sort of a little bit of an  
17 aberration in terms of, what do you do with that?

18 MR. MCCLOSKEY: Okay.

19 MR. FITZGERALD: But that doesn't  
20 necessarily mean there was an exposure. But there  
21 was a fire. So, clearly, the ones that were  
22 involved in putting it out, there might be some need  
23 to cover it.

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1 MR. MCCLOSKEY: We'll have to review  
2 that. Sorry for interrupting, Joyce. You can go  
3 back.

4 DR. LIPSZTEIN: Oh, okay. Now for the  
5 period of 1970 to 1979. One of SC&A's concerns was  
6 that beyond the 1970 the breathing zone that  
7 sampling conducted in the model shop, there are no  
8 early sampling data applicable to mag-thorium  
9 machining in the model shop, where mag-thorium  
10 machining operations took place from 1970 to 1979.

11 SC&A found that most of the references  
12 cited in NIOSH's response paper -- I mean the old  
13 response paper, not the one from yesterday,  
14 provided air sampling or surface contamination  
15 data to corroborate that the time limit was met or  
16 either not valid or relevant to its purpose, due  
17 to wrong time period, not falling within the 1970  
18 to 1979, or wrong plant location, not of the model  
19 shop during September 1970 to 1979.

20 So, there was no air sampling, just the  
21 one that they did as a test before  
22 commence -- before starting the mag-thorium  
23 operation in the model shop.

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1 SC&A calculated the significance of the  
2 limiting air concentration. We wanted to know  
3 what does this mean in terms of dose for the worker.  
4 So, we made a calculation for the committed  
5 equivalent doses from exposure to limiting air  
6 concentration.

7 For example, if we use type M thorium  
8 and we use one year continuous work by a mag-thorium  
9 worker, for inhalation of thorium-232, thorium-228  
10 and radium-224 considering the activity ratio from  
11 thorium-228 to thorium-232 equal to 0.19, as  
12 suggested by NIOSH, this gives a 20-year committed  
13 equivalent dose to the ground surface of 136 rems  
14 and a 50-year ground surface committed equivalence  
15 dose of 300 grams. Ground surface is the main arm  
16 for the position for thorium and is the highest  
17 dose.

18 So, I think that this limit is pretty  
19 conservative, looking at what one year of  
20 continuous work would give as a dose to the worker.

21 If we use this type of Type M thorium,  
22 if you use Type S thorium, and of course the most  
23 exposed organ, they have the highest dose is the

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1 exit of airways and the lungs.

2 And so for each year that the  
3 mag-thorium would work, considering thorium-228  
4 and thorium-232 they can even actually, if the 0.19  
5 was used, the difference is very small. The 20 to  
6 50 year committed equivalent dose of the  
7 extrathoracic airways is about 30 rems and the 20  
8 to 50-year lung-committed equivalent dose is about  
9 27 rem. I mean 20 to 50 years because it doesn't  
10 vary too much.

11 So, in summary, we have concluded in our  
12 White Paper that critical information regarding  
13 mag-thorium machining location workload and times  
14 range are lacking from '63 to '70, that the lung  
15 set of 1970 samples, as samples taken in the models  
16 shown are inadequate to demonstrate that the limit  
17 was bounding for the model shop from 1970 to 1979.  
18 But the limit itself that is being applied is very  
19 conservative and likely claimant-favorable.

20 So, we made some recommendation that in  
21 the absence of measurement data, NIOSH should  
22 validate the proposed air concentration limits for  
23 source term-based exposure model, followed by

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1 suitable sample dose reconstruction to demonstrate  
2 this is ability of applying this limit for the  
3 values operational time periods in question, 1963  
4 to 1966, 1966 to 1970, and 1970 to 1979.

5 I must say that you are going to see now  
6 that I am going to say it before NIOSH, NIOSH  
7 complied with most of SC&A recommendations for the  
8 period 1970 to 1979. They presented in the White  
9 Paper that was published on the website. Yes, they  
10 presented documents showing that the 1970 to 1979  
11 machining were wet operations and they calculated  
12 source term-based exposure modeling. And the only  
13 thing that was missing from our recommendation was  
14 the dose calculations for that period.

15 So, that's it.

16 CHAIR BEACH: Thank you, Joyce. So,  
17 any Work Group discussion? Questions for Joyce?

18 Brad, do you have any questions for  
19 Joyce before NIOSH starts?

20 MEMBER CLAWSON: No, I don't. Thanks,  
21 Josie.

22 CHAIR BEACH: Okay, seeing none at the  
23 table. Pat.

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1                   MR. MCCLOSKEY:     Okay, so thanks,  
2                   Joyce. The paper that she was referring to that  
3                   got to the NIOSH website yesterday, we had that  
4                   phone call a week or so ago and we told you then  
5                   that we would not have this paper ready for today's  
6                   meeting. We were expecting a verbal response to  
7                   this paper.

8                   CHAIR BEACH:     Right.

9                   MR. MCCLOSKEY:     Before we went on  
10                  vacation we got approval, technical approval, and  
11                  so we initiated the agency reviews and it moved  
12                  along a little bit faster than we expected. So,  
13                  it is out there.

14                  I have copies of it, if you want me to  
15                  hand those out. They are not appropriately marked  
16                  because there were further PA reviews done after.  
17                  But if you think that would be a good idea.

18                  MR. KATZ:     You don't need to really --

19                  MR. MCCLOSKEY:     Okay.

20                  MR. KATZ:     -- because it is available  
21                  now, posted, and everybody will have it.

22                  CHAIR BEACH:     Before you go on, I  
23                  wasn't sure if the Work Group knew about the meeting

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1 that we had. Pete had asked for myself to get on  
2 a meeting to talk about the dose reconstructions  
3 for a couple of different items. And I was sitting  
4 here thinking that the rest of the Work Group may  
5 not have been aware of that meeting.

6 I was on the meeting with Pete and then  
7 I asked Joe and Ted to be on the meeting. So, it  
8 wasn't a Work Group meeting. There was no  
9 transcript taken and it was basically so that --  
10 it was a technical call.

11 Has this been sent out? I'm wondering  
12 if the Work Group has a copy of this so that they  
13 know what we discussed. I didn't send it to  
14 everyone.

15 MR. KATZ: I didn't forward your -- no,  
16 I don't think so.

17 CHAIR BEACH: Okay. So, we will  
18 forward the note. It just basically talks about  
19 the dose reconstructions that we want for 13 and  
20 14, which will be discussed today also. I'm  
21 sitting here feeling bad that I hadn't gotten that  
22 out. So, sorry for interrupting.

23 MR. MCCLOSKEY: Okay. No, it's okay.

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1                   So, Joyce and SC&A put out their White  
2 Paper that we received on May 15th of this year and  
3 we were in the middle of working on responding to  
4 some of the other issues for this meeting. And so  
5 we didn't think we were going to get any lengthy  
6 response put together in time for this meeting.

7                   So, I mean, Joyce, you added a lot of  
8 issues within there, within your paper that, if we  
9 would have taken the time to answer all of them,  
10 we wouldn't have it ready for today.

11                   We recognize that there were a lot of  
12 things unanswered by the paper posted just the  
13 other day. So, we will just move forward with what  
14 we do have.

15                   So, the paper I will be reading from is  
16 on the website. I'm not going to read the whole  
17 thing. Joyce touched on some of the key issues  
18 there. The second paragraph says that we now have  
19 agreement for the period of August '61 to March  
20 31st, '63. It is the start of the mag-thorium  
21 machining operations at the Kansas City Plant.  
22 So, we are in agreement there.

23                   For the remaining period, we had some

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1 discussion about how to apply the methodology  
2 there. So, that is what this paper attempts to do  
3 is to describe what to do with the remaining period.

4 And then the SC&A paper, they wanted  
5 some more validation and they raised the question  
6 was mag-thorium even machined during the period of  
7 1963 to 1979. And in the absence of confirmatory  
8 data that showed actual operations occurring  
9 during that period, we were making the assumption  
10 that they continued. We didn't have confirmation  
11 that they stopped. We have records of a formal D&D  
12 of that process. So, we were moving and trying to  
13 acquire more data from the site and try to lock it  
14 down. But over time, we never got there.

15 So, what we are saying now, let's see  
16 -- since January -- I'm reading from page three,  
17 the first paragraph. Since January, NIOSH has  
18 continued to obtain and review documents and  
19 perform interviews. And based on the review of the  
20 information available from 1963 to 1979, NIOSH has  
21 determined that mag-thorium operations were  
22 suspended during April first '63 and did not begin  
23 again until receiving approval from Health

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1 Services on August 28, 1970.

2 So, we have now removed that period from  
3 the operations. Joyce touched on that already and  
4 we are saying they were suspended during that  
5 period.

6 We found some information to  
7 corroborate it and that would be the inventory  
8 information that shows -- it comes from NMMSS. It  
9 comes from these documents called Statement of  
10 Measurement documents.

11 So, there is an inventory document that  
12 has information beginning in 1969 and it documents  
13 the presence of mag-thorium inventory starting in  
14 only 1971. And another document of the NMMSS  
15 corroborates the inventory information also,  
16 documents the presence of mag-thorium beginning in  
17 '71.

18 So, we used inventory information to  
19 confirm our dates of operations.

20 Also, there are these reports from the  
21 site called Weekly Activity Reports. They  
22 corroborate the suspension of mag-thorium  
23 operations. They document a very small staff

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1 working in the area where we said the operations  
2 were occurring, Department 22. So, they had only  
3 five people working in that area on one shift and  
4 they also began their D&D of Department 22  
5 beginning in May of '64.

6 And by August of that same year, half  
7 of the machines were removed from the area and the  
8 staff was reduced to two part-time personnel. So,  
9 it was a very small staff in that area during that  
10 time period where we are saying that operations  
11 were suspended.

12 So, then we move on to 1970, where we  
13 do have information of another campaign starting.  
14 So, we reviewed the memo that helps define the date  
15 of operations for the second operational campaign  
16 starting in '70 and ending in 1977. In this  
17 memorandum, a 1970 start date was identified by  
18 model shop management, which corroborates the  
19 operational information discussed above about the  
20 suspension of activities. And the 1977 ending  
21 date agrees with the Source and Special Nuclear  
22 Material inventory information, which shows the  
23 last receipt in March of 1977.

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1           And NMMSS information does not indicate  
2 a later date of operations, other than waste  
3 management. So, if you look at the NMMSS, I have  
4 the report, a copy of it, here. It has mag-thorium  
5 dates of that inventory at the site and it has  
6 alloyed thorium up until -- what is it, '76 -- and  
7 then -- oh, here we go, that'll look better.

8           So, it has alloyed metal up until '76.  
9 Those are Joe's notes from NMMSS. And then the  
10 only other time with dates after '76 it is  
11 thorium/other awaiting disposal. So, yes, the  
12 mag-thorium was still on-site after '76 but as a  
13 waste in barrels.

14           I just held up SRDB reference 137786,  
15 for those of you on the phone.

16           Okay. SC&A wanted us, in their White  
17 Paper, to produce more air-monitoring results.  
18 There are no other air-monitoring results after  
19 1970, other than that one we have discussed several  
20 times. That was that negative exposure assessment  
21 where they followed each operation through model  
22 shop and took breathing air samples. That is all  
23 we had for that.

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1                   But NIOSH considers other things when  
2 we think about whether or not our methodology is  
3 bounding and when we looked at pyrophoricity of the  
4 material and how that would have caused the site  
5 to control this with work practices.

6                   So, we looked at the pyrophoric nature  
7 and the controls Kansas City Plant implemented to  
8 prevent fires. From the beginning of the  
9 operations in '61, KCP was sensitive to the hazard  
10 and required fire department involvement prior to  
11 any work. And they were explicit about that  
12 hazard, saying, quote, this alloy is a potential  
13 problem, primarily as a result of the pyrophoricity  
14 of the magnesium.

15                   Those guidelines followed throughout  
16 that campaign in the '70s, continued to address the  
17 pyrophoricity and included statements, such as the  
18 Fire Protection Department shall be contacted  
19 before initiation of the project and regarding any  
20 alterations in the process. So, we made sure that  
21 they had buy-in from fire protection personnel when  
22 any changes to this process occurred.

23                   And we took some interviews in March of

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1 this year and a few of those interviewees  
2 corroborated the fact that information was driven  
3 down to the floor level of operations and they  
4 actually implemented it and they were told that it  
5 was extremely flammable. Those are taken from  
6 Ted's notes of the March meeting.

7 So, that pyrophoric nature is a driver  
8 for many of their IH, industrial hygiene controls,  
9 such as their Good Housekeeping. If you look  
10 through those Health and Safety Management Guides,  
11 they talk about making sure there is no dust  
12 accumulation or waste accumulation. They make  
13 sure they run a clean operation.

14 And the pyrophoric nature also provides  
15 us with something that is very valuable in the  
16 health-physics regard and that is wetting  
17 controls. So, we looked at that and saw that all  
18 reports indicate that that work was a wet process.  
19 The mag-thorium machining was done wet. And some  
20 machine operations, such as those at a tape lathe  
21 in the model shop were performed completely  
22 submerged in coolant. They used a Cadet Z mineral  
23 oil coolant for these machine operations.

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1                   They kept those work practices  
2 throughout the '70s. They included state of the  
3 art controls that we even have in place today in  
4 our DOE world: medical surveillance, respiratory  
5 protection. And so they had that in place at the  
6 start of the campaign in 1970.

7                   I have moved over to page five, for  
8 anyone that is following along.

9                   And one of the guides says in quotes,  
10 all machining operations of this material shall be  
11 machined wet, using mineral oil base coolant, Cadet  
12 Z.

13                   The interviews we did in March  
14 corroborated the implementation on the floor that  
15 the chips were always kept wet. Then, we  
16 considered that, given that the material was  
17 wetted, it is not plausible that KCP machinists  
18 would generate a significant amount of dust.  
19 After 1970, the magnesium-thorium was a two percent  
20 thorium by weight and it doesn't seem plausible to  
21 reach concentrations greater than 3E-11  
22 microcuries per milliliter on a consistent basis.  
23 NIOSH estimates that breathing that air, one would

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1 inhale approximately 33 grams of alloy in a year,  
2 which is a very high number for a wet process.

3 So, then we went and looked at the SC&A  
4 report on Dow Madison. That is the organization  
5 that created the same magnesium-thorium that KCP  
6 operated with, that they machined.

7 And there were some interesting parts  
8 from that report. They took an affidavit from a  
9 mill operator and he said that there was no airborne  
10 dust. He said any dust generated would have been  
11 smothered by the mill coolant.

12 And Dow Madison was working to a  
13 procedure that they also provided to Kansas City  
14 Plant and it was the basis for many of the controls  
15 at the beginning of all of the controls that Kansas  
16 City Plant used. So, they were all using similar  
17 controls for the work.

18 So, in that same SC&A report, they had  
19 some breathing zone air sampling discussed, while  
20 Dow Madison was doing some very aggressive machine  
21 operations, such as open-wheel surface grinding,  
22 air-operated vibration sanding, buffing and  
23 drumming of mag-thorium powder. And during those

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1 fairly aggressive activities, the highest air  
2 concentration they saw in the breathing zone was  
3 3.9E-12 microcuries per milliliter. So, that is  
4 almost an order of magnitude lower than the control  
5 level that we have used for our methodology.

6 So, that would have yielded a dose of  
7 8 rem per year at that highest level with that Dow  
8 saw during those aggressive activities. That  
9 would be CEDE, committed effective dose  
10 equivalent.

11 MR. SHARFI: If it's an annual dose.  
12 That was for a year, right?

13 MR. MCCLOSKEY: Yes. Okay, and then  
14 NIOSH believes that the operations at Dow represent  
15 a worst case exposure scenario, and it is not likely  
16 the Kansas City Plant's machinists were exposed to  
17 a higher concentration on a 2000-hour  
18 time-weighted average basis.

19 Okay, so now I will jump down to the  
20 source term. SC&A requested corroborating data  
21 and, in the absence of such data, recommends a  
22 source term-based exposure model. So, they asked  
23 for some air-monitoring data and we said after

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1 1970, we wish there were more but there isn't. So,  
2 they came with a solution, not just wondering where  
3 is the data but they offered us something we could  
4 try. And what we did was we looked at what  
5 inventory information was available. We reviewed  
6 it and we didn't see extensive source-term  
7 information and recognize that it was limited,  
8 however, it could be explained. The lack of this  
9 inventory information could be explained by the  
10 small-scale nature of those operations and that  
11 there just wasn't much inventory after they started  
12 tracking it in 1969. And we provide some  
13 corroborating information from Waste Management  
14 reports for that.

15 But, nevertheless, we go on with our  
16 calculation. We took the largest set of inventory  
17 information for a particular year we could find,  
18 that was 1973 and there is the reference there. It  
19 comes from the Statement of Measurement records  
20 that Joe found at Kansas City Plant. And then we  
21 had information from eight separate months during  
22 that year, added it up and it came up to 42 kilograms  
23 of thorium. And we used NUREG-1400, their

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1 equation 1.2, and it is listed here. You can go  
2 through that if you like.

3 That NUREG provides guidance from the  
4 NRC for sites to determine whether or not they need  
5 to do air monitoring. And there is a calculation  
6 available there where you can assess your  
7 operations and determine what degree of protection  
8 you are using, glove bags, glove boxes, inhalation,  
9 what state the material is in, is it a metal, is  
10 it powder. And you apply all of those that you  
11 think are appropriate.

12 And what we did, if you went through it  
13 there, you would see that we went with the more  
14 conservative decisions on each one of those and we  
15 came up with a -- and that yields an intake rate.  
16 The person around that material would receive --  
17 fire alarm.

18 MR. KATZ: Fire alarm. Okay. Well,  
19 we are going to break for the fire alarm. I'm not  
20 going to kill the phone. I'm just going to put it  
21 on mute, so you don't have to hear the alarm. And  
22 we will be back as soon as they let us back.

23 (Whereupon, the above-entitled matter

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1 went off the record at 9:48 a.m. and resumed at 9:53  
2 a.m.)

3 MR. KATZ: Okay, so we are back in the  
4 room. There was no fire but everyone is good.

5 So, continue.

6 CHAIR BEACH: Okay. So, Pat, you were  
7 saying.

8 MR. MCCLOSKEY: Yes, so that  
9 NUREG-1400 calculation that we showed starting on  
10 page six and continuing onto seven, it yields an  
11 intake rate for someone that works around that  
12 material. And we calculated  $4.2E-3$  grams per  
13 year. We used the specific activity of  
14 thorium-232 and converted it to activity and came  
15 up with  $4.62E-10$  curies per year of an intake and  
16 that converts to 17.1 becquerel per year.

17 When we compare that amount, that  
18 intake amount that you would get from the  
19 NUREG-1400 calculation to an intake amount based  
20 on our bounding methodology, the  $3E-11$  microcurie  
21 per milliliter and SC&A did us the service of  
22 calculating that in their Finding 7 of their most  
23 recent May document, May 2015. You can see where

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1 they have calculated it. And what they came up  
2 with is 2,664 becquerel per year. That's a good  
3 calculation.

4 So, what that shows is the source-term  
5 calculation, based on all that conservatism and  
6 based on the highest inventory amount for a year  
7 that we could find is 156 times smaller than our  
8 ER method.

9 So, there is some corroborating  
10 information for you. We used plenty of  
11 conservatism, we think, in that calculation but if  
12 we want to go off and see if in fact '73 was the  
13 worst-case for that year, we could go back to NMMSS  
14 and see if we can refine that.

15 We just offer that in response to SC&A's  
16 request, just as an additional layer of assurance.  
17 We are not going to use that for any DRs or  
18 anything.

19 So, in conclusion, at the end of the  
20 paper, we say that NIOSH, along with SC&A and the  
21 Advisory Board Work Group, has been reviewing  
22 Kansas City Plant documents and interviewing  
23 personnel since 2004 regarding radiological work

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1 at the Kansas City Plant. And for the last several  
2 years, we have specifically been searching for  
3 mag-thorium information. NIOSH continues to seek  
4 and review additional information.

5 Based on a review of the information  
6 available at this time, NIOSH believes the weight  
7 of evidence supports the ER's bounding method, as  
8 modified with the Advisory Board's and SC&A's  
9 assistance, as plausible and claimant-favorable.

10 CHAIR BEACH: Okay, thank you, Pat.  
11 Just for clarification, I have one action that  
12 Joyce brought up about the fire in 1964 that Pat  
13 was going to go back and review the SRDB for that  
14 incident. So, that was one action.

15 Joyce, are there any other issues with  
16 NIOSH's paper, just in summary?

17 DR. LIPSZTEIN: Yes, I don't think it  
18 is clear how they are going to apply this limit of  
19  $3E-11$  microcuries per milliliter. They are going  
20 to apply it to the whole period from 1961 to 1979  
21 continuous exposure of workers. How are they  
22 going to apply this limit?

23 CHAIR BEACH: Okay, I think that is

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1 part of the Work Group's question as well, how it  
2 is going to be applied and to whom.

3 MR. MCCLOSKEY: Okay, first, Joyce, if  
4 you get a chance or someone gets a chance to find  
5 the SRDB reference for the fire, I heard you say  
6 that you read --

7 DR. LIPSZTEIN: I'll get it now. It is  
8 in one of the papers that you gave -- just one  
9 second.

10 CHAIR BEACH: While Joyce is looking  
11 for that, Work Group Members, any questions for  
12 NIOSH or SC&A at this time?

13 Brad, anything?

14 MEMBER CLAWSON: No, not at this time.

15 CHAIR BEACH: All right.

16 DR. LIPSZTEIN: It is 137860.

17 MR. MCCLOSKEY: Okay.

18 CHAIR BEACH: Thank you.

19 DR. LIPSZTEIN: It's a paper that you  
20 cite just before the second campaign in the last  
21 line. Then, on page three, there is something  
22 about the fire in October 28, 1964.

23 And I think that I would like to know,

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1 as part of the dose calculation and was already  
2 asked, to whom is this going to be applied.  
3 Because I saw some interviews of people that were  
4 working on D&D and they were dismantling the  
5 machines and things like that, so their exposure  
6 is certainly different.

7 CHAIR BEACH: Okay.

8 MR. MCCLOSKEY: So, to start that off  
9 with Joyce asked from the period of '63 to '79, are  
10 we going to apply the 3E-11 continuously.

11 So, we have now said from '63 to '70,  
12 those operations were suspended. So, it is pretty  
13 clear that we are not applying it there.

14 CHAIR BEACH: So, '63 to '70, so I am  
15 clear.

16 MR. MCCLOSKEY: Yes, no operations.

17 CHAIR BEACH: Okay.

18 MR. MCCLOSKEY: So, we now have two  
19 mag-thorium periods.

20 CHAIR BEACH: Okay.

21 MR. MCCLOSKEY: We have a '61 to '63 and  
22 then a '70 to '77, roughly.

23 And so, from -- and Mutty will help with

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1       how we apply the 3E-11 over the years, now where  
2       it is, in effect.    So, we have everyone that  
3       submits a claim that has a job description that we  
4       can match to the TBD-6000 generated job  
5       descriptions in the ER, such as operator,  
6       supervisor, laborer, and other categories there  
7       where they give different ratios of what the  
8       operator gets, different ratios of the 3E-11.

9                So, at the March visit you guys obtained  
10       some really good, useful documents for us to help  
11       apply this.    And those include job descriptions.  
12       One of them is an Excel spreadsheet that has each  
13       Kansas City Plant job description, what all they  
14       would have done, and where they would have done it,  
15       what area.

16               And this one file that he got, he got,  
17       well I will say three or four of them, so that is  
18       going to help us, when claims come in, determine  
19       which of those four TBD-6000 categories that person  
20       fits into.

21               And so they will -- we will determine  
22       where they were, to the best we can, with our normal  
23       DR practices, and apply their category of exposure

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1 for that period of time.

2 Am I missing anything?

3 MR. DARNELL: No. I'm actually  
4 looking at the SRDB reference that Joyce gave us.  
5 I don't see any reference to fire in the Weekly  
6 Activity report but in Joe's note, he references  
7 a magnesium fire in Department 90, which is --

8 MR. FITZGERALD: I don't even remember  
9 what 90 is now.

10 MR. DARNELL: Ninety was not part of  
11 radioactive work. It was magnesium work done in  
12 other places.

13 MR. DARNELL: Oh.

14 MR. FITZGERALD: But Department 90 was  
15 never one of those.

16 MR. DARNELL: Oh, it may be a magnesium  
17 fire that was not related to the mag-thorium work.

18 MR. MCCLOSKEY: They did machine pure  
19 magnesium without the thorium. Correct?

20 MR. DARNELL: That is the only  
21 reference. Joyce, is that correct, the reference  
22 that you are talking about?

23 DR. LIPSZTEIN: Yes. Actually --

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1 MR. DARNELL: Okay, that was actually  
2 not radioactive work.

3 MR. FITZGERALD: That may be magnesium  
4 not related to magnesium-thorium, now that we have  
5 the reference in hand. We can verify that.

6 DR. LIPSZTEIN: In 1964, there was  
7 still some activity, although --

8 MR. DARNELL: Oh, there is no  
9 disagreement that there was activity going on with  
10 the mag-thorium. It is just that in this  
11 particular location, they did not use radioactive  
12 materials.

13 MR. MCCLOSKEY: Well, actually, we  
14 said there is no machine operations in '64. So,  
15 if it even indicates that there is machining  
16 operations after '63, we still need to evaluate  
17 that.

18 MR. DARNELL: It is just evaluate to  
19 see if it is pure magnesium or magnesium-thorium.

20 DR. LIPSZTEIN: I think '64 has to be  
21 evaluated.

22 (Simultaneous speaking.)

23 MR. FITZGERALD: I think that

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1 clarification should be -- we should be able to do  
2 that pretty straightforward.

3 MR. DARNELL: I'm almost positive that  
4 there was never radioactive work in Department 90.  
5 We can just double-check that.

6 MR. FITZGERALD: We can double-check  
7 that but that very well may be the case.

8 DR. LIPSZTEIN: Because we know that  
9 there was machining came out of uranium in other  
10 departments after they cleaned Department 22. So,  
11 I don't know if the magnesium-thorium also moved  
12 to other places.

13 MR. FITZGERALD: Yes, what we are  
14 saying, Joyce, is that it is worth just confirming  
15 --

16 DR. LIPSZTEIN: Yes, looking at it.

17 MR. FITZGERALD: -- looking at it as  
18 far as what exactly Department 90 was at that time  
19 and what was being machined in there.

20 CHAIR BEACH: Okay. So, what I am  
21 hearing -- yes, NIOSH is going to do that -- 1963  
22 to 1970, other than clarifying the 1964, that there  
23 was no mag-thorium work done. So, there is no dose

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1 reconstruction going to be done.

2 But 1970 to 1977 is still --

3 MR. SHARFI: It would be 1964 to 1970.

4 Right?

5 MR. MCCLOSKEY: Let me read the exact  
6 dates.

7 CHAIR BEACH: Okay, give me the exact  
8 dates, so I can have them. Thank you.

9 MR. MCCLOSKEY: I think we can find  
10 those in our White Paper.

11 CHAIR BEACH: Yes.

12 MR. MCCLOSKEY: So, there is a period  
13 from August '61, so that would be August 1, '61  
14 through March 31, '63. That is the first period  
15 of magnesium-thorium operations that we have  
16 agreed on.

17 Then the second period, so operations  
18 are suspended from April 1, '63, they are suspended  
19 up until -- and did not begin again until after  
20 receiving approval from Health Services on August  
21 28, 1970. Yes, that is practically the end of  
22 August but that is our first indication.

23 And that ends up being, the first thing

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1 that we see that they have done there is that one  
2 where they took the air sample. That ends up being  
3 the first firm confirmation of operations  
4 occurring.

5 But we were saying as soon as they got  
6 the release to do work in August, on August 28th  
7 of '70, that is when the second campaign starts.  
8 And since we were using the inventory information  
9 to corroborate all this, we also said that since  
10 the NMMSS information and other inventory  
11 information shows -- and especially a document from  
12 a manager of the area, where -- I can pull that out  
13 and read it. It might help. But we used that also  
14 now to cut off operations in '77.

15 MR. FITZGERALD: You're cutting it off  
16 in '77 rather than '79 at this point.

17 MR. MCCLOSKEY: Yes, since we were  
18 using that inventory information to confirm other  
19 dates, we were going to stick with it and say --

20 MR. KATZ: Do you have a month for that?

21 MR. FITZGERALD: This says December of  
22 '77.

23 MR. MCCLOSKEY: Yes, December 31, 1977

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1 because the inventory information is annual now.  
2 Annual dates, so we went with December 31st. Is  
3 that clear for you, enough?

4 CHAIR BEACH: Yes.

5 MR. FITZGERALD: So, if a worker  
6 self-identified as a mag-thorium worker who  
7 happened to work from the beginning of that period  
8 to say '61 and, thereafter, that individual would  
9 get the ER, I can't remember the exact value but  
10 the value in the ER for '61 to '63. And then even  
11 though he self-identifies as a mag-thorium worker,  
12 no credit for '64 through '70.

13 MR. MCCLOSKEY: For mag-thorium.

14 MR. FITZGERALD: Right. But then  
15 would get the 3E-11, if we was an operator from '70  
16 to '77.

17 If the individual is not an operator,  
18 but had access to the area, then they would get  
19 proportionally less, depending on the worker  
20 category. I think there were three other  
21 categories of labor, something like that.

22 So, that is kind of the ER picture.

23 MR. DARNELL: I actually have a little

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1 bit of a problem with saying a worker  
2 self-identified as a mag-thorium worker because we  
3 have had evidence in the interviews that workers  
4 actually never really knew specifically what they  
5 were working with.

6 I think that we had a worker with  
7 medical records --

8 MR. FITZGERALD: To substantiate that  
9 they were doing it.

10 MR. DARNELL: Yes.

11 MR. FITZGERALD: Okay, good point.

12 The only wrinkle in this that we  
13 actually can pick up on D&D and waste handling is  
14 whether that pre-established category that is  
15 discussed in the ER where you proportionately  
16 assign less than 50 percent, depending on worker  
17 category, it is still a little fuzzy as how it would  
18 apply to the laborers who were, in fact, doing  
19 direct handling. We can deal with that in the  
20 other issues but I know that was set up before we  
21 actually started investigating what these other  
22 categories were doing. And I think that was more  
23 of a generic labor category. And we are sort of

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1 looking a little more specifically at laborers who  
2 happen to be carrying waste or happen to be doing  
3 small letter D&D. So, I am a little bit uncertain  
4 about whether that generic would apply to those  
5 kind of folks.

6 MR. MCCLOSKEY: Yes, I mean anytime you  
7 just simply have four categories for a site as  
8 complex as Kansas City Plant, you are going to come  
9 across categories of workers that their square peg  
10 doesn't necessarily fit perfectly into that round  
11 hole.

12 MR. FITZGERALD: Yes, just as an  
13 asterisk on this one. I think we are, generally,  
14 pretty satisfied but I think that is the only --  
15 and that is addressed in other issues.

16 MR. MCCLOSKEY: We can talk about that  
17 further.

18 MR. FITZGERALD: We can talk about that  
19 further later.

20 But so that is kind of the ER. I think  
21 that is the ER picture for mag-thorium.

22 CHAIR BEACH: Okay. So, the other  
23 part of this is also the example dose

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1 reconstruction that we had asked for being  
2 completed and we are going to get that at a later  
3 time. Correct?

4 MR. DARNELL: Correct, once we get done  
5 agreeing on all the aspects, we are planning on  
6 giving you the entire product, instead of a  
7 piecemeal product.

8 CHAIR BEACH: Okay. So, other action  
9 items, anybody? Joyce, do you have anything else?  
10 I know NIOSH is going to still track down that time  
11 period and get back to us on that.

12 DR. LIPSZTEIN: Okay. No, that is it.  
13 And I have just the people from decontamination,  
14 how they are going to be treated.

15 CHAIR BEACH: Did you say D&D?

16 DR. LIPSZTEIN: Yes.

17 MR. FITZGERALD: Yes, D&D, one set, for  
18 example, went through and dismantled the  
19 equipment, the lathes after the mag-thorium period  
20 ended. I think it is certainly in question. That  
21 is kind of addressed in a different issue.

22 MR. MCCLOSKEY: Yes, we can do that now  
23 or later.

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1 MR. FITZGERALD: It's up to the chair.

2 CHAIR BEACH: I think it fits better in  
3 the other issue.

4 MR. MCCLOSKEY: Yes, if it comes to a  
5 point where we close this issue and then move to  
6 another issue, whichever you think is appropriate.  
7 Whatever you want to do.

8 MR. FITZGERALD: We can move to those  
9 two issues, if you want to segue into D&D and waste  
10 handling. It does include mag-thorium,  
11 obviously.

12 MR. MCCLOSKEY: Yes.

13 CHAIR BEACH: So yes, we can -- what is  
14 the Work Group's preference here?

15 MEMBER LOCKEY: It is a good segue into  
16 those too.

17 CHAIR BEACH: It is, actually. And we  
18 were going to go to 11:00 but Ron's not with us now.

19 So, any other issues with 13? Any  
20 other clarification? Everybody comfortable with  
21 that? Then, we will move --

22 DR. MAURO: Josie, this is John Mauro.

23 CHAIR BEACH: Yes, hi, John.

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1 DR. MAURO: Hi, everybody. I've been  
2 on for a while, listening. I have one question  
3 sort of after I started to read some of this  
4 material, and in light of the fact that I did a lot  
5 of work early on at the site and also at Dow.

6 CHAIR BEACH: Of course.

7 DR. MAURO: This limit to dust, the  
8 airborne limit that was established, that 10 to the  
9 minus 11 number that was in place and that becomes  
10 sort of the rock you are going to stand on right  
11 now. It is my understanding that the airborne  
12 thorium was really actually a magnesium-thorium  
13 dust that was two percent by mass of thorium. Is  
14 that correct? The inhalation exposure that we are  
15 dealing with is airborne thorium that is basically  
16 a thorium-magnesium alloy that consists, in terms  
17 of it's two percent of thorium by mass. And I was  
18 wondering what the milligrams per cubic meter are  
19 when you have that limit on thorium because I seem  
20 to recollect that certainly -- I understand the  
21 arguments being made here but I would be interested  
22 in knowing what that converts to in terms of  
23 milligrams per cubic meter because I think that

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1 also goes toward weight of evidence as to whether  
2 that strategy is, in fact, fairly kind of  
3 favorable. I think you may find -- I can't say this  
4 for certain because I haven't run the calculation  
5 -- I just thought of it while you were talking, that  
6 the number of milligrams per cubic meter might be  
7 quite high, when you are dealing with a two percent  
8 alloy.

9 So, I would just like to raise that  
10 question. Maybe it could be looked into and help  
11 to get some insight as to whether not that is a  
12 fairly high dust load.

13 MR. FITZGERALD: Yes, actually, John,  
14 I think Jim Neton, when he sat in on one of our Work  
15 Group meetings, raised the question of whether you  
16 would reach the threshold of breathability, just  
17 because of the amount of thorium involved. That  
18 was a comment he made back in January, I think.

19 DR. MAURO: Okay.

20 DR. LIPSZTEIN: And we answered it,  
21 John, and we calculated it and we saw that it is  
22 fairly invisible dust. It doesn't impair your  
23 respiration. So, it is what is possible to have

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1 that in the air.

2 DR. MAURO: Okay, thank you.

3 DR. LIPSZTEIN: So, we made out a  
4 calculation to see if that dust was visible but not  
5 in carrying the health of the -- respiration of the  
6 worker.

7 DR. MAURO: Very good. Thanks for  
8 answering my question.

9 CHAIR BEACH: John, Pat was going to  
10 answer it as well. But if you are satisfied, then  
11 --

12 MR. FITZGERALD: Yes, I remember that  
13 dialogue because Jim Neton raised that same  
14 question.

15 MR. MCCLOSKEY: It is in our January  
16 15th paper, and it equates at 1.1E-11 microcuries  
17 per milliliter.

18 CHAIR BEACH: Okay. So, we are going  
19 to go ahead -- oh, go ahead, John.

20 MEMBER POSTON: I'm sorry. I've been  
21 sitting here trying to figure out exactly this  
22 whole thing because I used to run a lathe and I never  
23 did anything that didn't use coolant. And it seems

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1 to me the coolant knocks down the dust. So, I have  
2 been trying to figure out how you get to this high  
3 number for any situation, especially something  
4 that is like magnesium, which is pyrophoric in  
5 certain situations.

6 MR. SHARFI: And the Dow Madison's were  
7 an order of magnitude well below that, when made  
8 in the similar operations.

9 MR. MCCLOSKEY: That was our thought  
10 all along with saying that we could bound this and  
11 that there would not be high airborne values. They  
12 wouldn't exceed their engineered bounds because of  
13 their adherence to wet methods and the  
14 pyrophoricity of the material. And they are  
15 concerned with that.

16 MEMBER LOCKEY: For hard metal  
17 pneumoconiosis, actually the coolant is  
18 potentially for sensitization to cobalt. So, I am  
19 not -- you say it knocks down the dust, but in that  
20 particular disease process, cobalt just dissolves  
21 in the coolant and actually is the biggest risk for  
22 sensitization.

23 MEMBER POSTON: How do you aerosolize

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1 the coolant?

2 MEMBER LOCKEY: In the process of  
3 machining it is aerosolized.

4 MR. MCCLOSKEY: So the coolant makes  
5 things worse, really?

6 MEMBER LOCKEY: Yes, because the metal  
7 is dissolved into the coolant. And the machine  
8 process, whenever you have a machine process, you  
9 are going to aerosolize the coolant, unless it is  
10 contained.

11 (Simultaneous speaking.)

12 MR. MCCLOSKEY: Are you familiar with  
13 that applying it to anything else, besides cobalt?

14 MEMBER LOCKEY: It is just I know in  
15 cobalt it is a risk factor. So, I am just saying  
16 there is another side of that.

17 CHAIR BEACH: Yes, there is.

18 MR. DARNELL: We need to take a step  
19 back and look. We are dealing with two pyrophoric  
20 materials.

21 MEMBER LOCKEY: I'm sorry?

22 MR. DARNELL: We're dealing with two  
23 pyrophoric materials. If we aerosolized them, we

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1 would have had many fires.

2 MEMBER LOCKEY: I'm not knowledgeable  
3 about that. I just know that with cobalt, it is  
4 an issue.

5 MR. DARNELL: I agree with you.  
6 Actually, I remember it from the Pathline days  
7 because we had that same issue when we had to grind  
8 inside piping. But for magnesium or thorium, both  
9 pyrophoric materials, if you are able to aerosolize  
10 them, you are also able -- that separates that from  
11 the oil for some part of that also, which would have  
12 meant a flash fire hazard. We didn't have that.  
13 We have no evidence of that. We have no records  
14 of that happening. It would have been happening  
15 quite often, had that same process with cobalt-60  
16 been occurring here.

17 So, because we have a loud  
18 preponderance of no fires, we know that that wasn't  
19 going on.

20 CHAIR BEACH: Okay, thank you. So,  
21 thank you.

22 We are going to move on to Issue 17. It  
23 segues naturally into this. NIOSH has a paper they

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1 put out June 11th that discusses that topic, and  
2 then SC&A's memo. NIOSH, would you like to go  
3 ahead and start?

4 MR. DARNELL: Let me think where we  
5 are.

6 CHAIR BEACH: Seventeen, D&D  
7 Operations.

8 MR. DARNELL: Give me just a second.

9 CHAIR BEACH: Sure.

10 MR. MCCLOSKEY: Are you talking about  
11 the memos? There were a bunch of memo responses.

12 CHAIR BEACH: We'll go through the D&D  
13 and then take an official break.

14 MEMBER POSTON: No fire alarms.

15 CHAIR BEACH: Hopefully not.

16 MR. MCCLOSKEY: Okay.

17 CHAIR BEACH: So, do you want to  
18 summarize anything, Joe, first, and then have Pat  
19 or what do you guys --

20 MR. MCCLOSKEY: I can read your summary  
21 that we have.

22 MR. FITZGERALD: Well, we've given  
23 each other a summary. Either way.

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1                   MR. MCCLOSKEY: All right, here is  
2 Joe's summary of where we are on 17. He says or  
3 SC&A says similar to Issue 7 for radwaste handlers,  
4 SC&A concluded that these activities were being  
5 performed by worker category distinct from uranium  
6 or thorium workers, who were not necessarily  
7 monitored based on interviews and that these  
8 workers or laborers would have been, potentially,  
9 exposed.

10                   Again, NIOSH notes that it had  
11 identified two out of four laborers as having  
12 internal monitoring records and, quote, will use  
13 that data, where appropriate, to reconstruct  
14 doses.

15                   It is further noted that the ER  
16 acknowledges and addresses the fact that various  
17 worker categories had a varying exposure potential  
18 and that, furthermore, an extensive procedural  
19 review confirmed that Kansas City Plant  
20 implemented a robust air and personal monitoring  
21 program. Similarly, a review of SC&A's 2007  
22 report a focused review of operations in thorium  
23 exposures at the Dow Chemical Madison plant

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1 concludes that it is not likely the Kansas City  
2 Plant handlers were exposed to a higher  
3 concentration of airborne thorium-232 on a  
4 2000-hour time weighted average basis.

5 SC&A's comments on that are that NIOSH,  
6 again, references the two bioassay data points  
7 identified for laborers and goes on to make a  
8 programmatic case. The Kansas City Plant had a  
9 robust contamination control program and that the  
10 monitoring data for uranium workers validate the  
11 bounding methods of the ER.

12 However, with only two data points for  
13 laborers and some question as to whether both of  
14 these particular laborers conducted D&D, it is not  
15 clear how these bounding data would be applied for  
16 them. Assuming they were cleaning rooms where  
17 uranium machining had taken place, such as those  
18 in Department 20, it remains unclear why any such  
19 unmonitored workers conducting these activities in  
20 uranium contaminated areas would not have the  
21 bounding uranium worker dose distribution applied  
22 for the D&D time period in question.

23 NIOSH's case regarding thorium is more

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1 persuasive. SC&A agrees that these workers were  
2 unlikely to be exposed to residual thorium  
3 concentrations in excess of 1.5E-11 microcuries  
4 per milliliter.

5 So, that is basically what --

6 MR. FITZGERALD: Yes, I think that is  
7 where we are at.

8 MR. MCCLOSKEY: Okay.

9 MR. FITZGERALD: And that issue,  
10 again, is that we sort of just got into in March  
11 looking at some of these cases and interviewing  
12 some of these workers. And we weren't aware that  
13 there was actually any internal data, internal  
14 bioassay data for any of them, because initially,  
15 they didn't recall any, but you found, I think, at  
16 least two out of the four that we did interview did  
17 have data.

18 MR. MCCLOSKEY: Yes.

19 MR. FITZGERALD: So really, kind of  
20 before it was sort of like okay, what do we do  
21 because they are, essentially, unmonitored workers  
22 but now we actually have some data points. And the  
23 so the question is a little different and saying

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1       okay, we do have some data and you are going to use  
2       that in some fashion for dose reconstruction  
3       apparently or maybe for those individuals alone.

4               But I just want to broach this subject  
5       to clarify. We got into this issue originally  
6       because I think there was some uncertainty about  
7       whether the operators handled their own waste and  
8       who did D&D and that was the whole genesis of let's  
9       figure out how this was done. And we did find, I  
10      think, that well, there was this whole category of  
11      workers that we were aware of but didn't quite  
12      appreciate everything they did. These laborers  
13      actually handled a lot of the waste that fell to  
14      the floor and picked it up and moved it to a central  
15      area.

16              For the D&D, the small D&D, not the  
17      two-year D&D that the ER refers to, that happened  
18      pretty continuously, which is not surprising. And  
19      that was handled by laborers who took machines  
20      apart and decontaminated them and all that.

21              MR. DARNELL:       Those people were  
22      laborers that were actually dressed out.

23              MR. FITZGERALD:   Yes, dressed out and

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1 everything. But the question was okay, so we do  
2 have this subcategory of laborers that we weren't  
3 appreciative of when the ER was put together. In  
4 terms of dose reconstruction, those folks, the ones  
5 that we can establish did small D&D, small letter  
6 D&D and did handle the waste, what bounding dose  
7 would they get or what contribution would be  
8 assigned them?

9 It wasn't clear from the last write-up.  
10 That is kind of what you just read, exactly what  
11 would be done. I mean it looks like for certain  
12 individuals that happen to have data, they would  
13 be given that dose but if there was a category of  
14 workers, some of whom don't have any internal dose  
15 but were established as having done D&D or handling  
16 waste, there doesn't seem to be enough to do a  
17 coworker model.

18 So, it is kind of an open question. How  
19 would you actually implement dose reconstructions  
20 if you were to find these categories of workers that  
21 we, I think, found from interviews? Yes, they  
22 actually, day-to-day handled a lot of waste that  
23 would go into the waste site and D&D, they actually

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1 did pick this equipment apart. So, it seems like  
2 they were a category of workers that were being  
3 exposed more than this generic sort of, of all the  
4 laborers in the plant, they were getting exposed  
5 more.

6 Now, were they being exposed as much as  
7 the operators? It's not clear but sort of begs the  
8 question how do you treat those, in terms of these  
9 workers if they do file claims, how would you dose  
10 reconstruct them?

11 MR. DARNELL: My personal opinion, I  
12 believe this is rather straightforward. The way  
13 we have handled it in other sites is these type of  
14 workers were getting the 50th percentile of  
15 operator dose.

16 MR. SHARFI: Are we talking about  
17 uranium now?

18 MR. FITZGERALD: Just talking uranium  
19 for now, yes.

20 MR. SHARFI: At that point, I mean, I  
21 guess your question of whether or not there is  
22 enough data to do a coworker, are you talking about  
23 a stratified coworker or are you talking about --

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1 MR. FITZGERALD: Well, I am just saying  
2 that --

3 MR. SHARFI: Generally, we have a  
4 coworker set. I don't know whether or not we will  
5 be able to stratify it in that sense, to stratify  
6 them but we would have a coworker approach for those  
7 individuals that you could apply coworker.

8 MR. FITZGERALD: That was one of my  
9 questions saying that okay, they were exposed to  
10 uranium but they weren't operators.

11 MR. SHARFI: Correct.

12 MR. FITZGERALD: The thing you are  
13 talking about, 50 percent, I would be a little  
14 concerned about that.

15 MR. SHARFI: There is not a percentile  
16 at that point. I mean the internal coworker is,  
17 depending on whether you fall at the geometric mean  
18 or the distribution where you are getting the 95th  
19 percentile, that is generally how the coworker --

20 MR. FITZGERALD: As I recall the ER, it  
21 does carve out groups; operators would be given the  
22 full dose. Laborers, the different categories  
23 would get a portion of the last 50 percent, say.

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1           In this case, I think that would not  
2 necessarily fit very well just because I think the  
3 exposure potential is specifically, and you  
4 mentioned this earlier, Pat, that you have groups  
5 within this broad category that are a little  
6 different. They were certainly handling stuff  
7 more directly than the rest of the laborers in the  
8 plant.

9           So, if they came forward and said well,  
10 yes, I did D&D or my job is to go in and clean up  
11 after the uranium lathe operators, I would think  
12 -- and I was just thinking out loud in our response,  
13 that I probably would apply the uranium coworker  
14 model to them since, basically, without splitting  
15 hairs, they probably got more than the standard  
16 generic person in the plant. Did they get as much  
17 as an operator? Who knows? But they certainly  
18 fell in that category where it would be easier just  
19 to apply the uranium coworker model.

20           But it wasn't clear after we went  
21 through all that in your response on what data you  
22 found exactly what would be the NIOSH approach to  
23 dose reconstruction in those particular

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1 subcategories of workers.

2 MR. SHARFI: Yes, I mean generally I  
3 would say those people fall into the use of  
4 coworker.

5 MR. FITZGERALD: The broader uranium  
6 coworker model.

7 MR. SHARFI: Yes. Yes, I mean it  
8 depends upon the year period because I think  
9 pre-'59 we used the Battelle 6000 approach to cover  
10 them and then from '59 to '70, there is a coworker  
11 model that would cover that.

12 MR. FITZGERALD: Well, that is the  
13 clarification I was looking for. What would you  
14 do with these workers? Would you include them in  
15 the broader coworker model for the uranium worker,  
16 operators, workers, or would you assign them this  
17 fractional? I think the ER has some fractional  
18 dose assignments which I would have more of a  
19 problem with because I think they probably would  
20 fit that generic category.

21 MR. MCCLOSKEY: Yes, it could have been  
22 more clear, though. You are right.

23 For natural uranium, it is -- that

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1 issue, I think we are closed on that one, but it  
2 is a TBD-6000 was the various operator, supervisor,  
3 admin, whatever ratios.

4 MR. FITZGERALD: Right.

5 MR. MCCLOSKEY: But what we do for the  
6 depleted uranium is coworker. And that is what you  
7 are saying would be more appropriate. And that is  
8 what we plan to do.

9 MR. FITZGERALD: Okay. I think that  
10 was one clarification I would like.

11 MR. MCCLOSKEY: And as far as like  
12 understanding these many categories of workers, I  
13 think we are getting better at that with more  
14 information that we get describes all of their --

15 MR. FITZGERALD: Well, we have gone --  
16 we weren't sure who was actually handling the waste  
17 and who was actually doing some of these small  
18 letter D&Ds. And I think that became a lot clearer  
19 from the last set of interviews, that you did have  
20 people that were focused on doing that kind of work.

21 MEMBER LOCKEY: I'm sorry?

22 MR. FITZGERALD: That were being  
23 assigned to do D&D on the site. The ER speaks to

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1 a very major D&D that took place like '83 and '84,  
2 something like that.

3 MR. MCCLOSKEY: Yes, '84 to '87.

4 MR. FITZGERALD: 1984 to 1986 but  
5 doesn't account for any other D&Ds. And of course,  
6 in a plant with a 50-60 year old history, you are  
7 always tearing things down and cleaning things up.

8 And we did establish that the laborers,  
9 which is the category of workers at Kansas City,  
10 were assigned to do that kind of work.

11 CHAIR BEACH: A small scale D&D.

12 MR. FITZGERALD: A small scale D&D,  
13 yes.

14 MEMBER LOCKEY: So, there were four  
15 were interviewed, two actually had records.

16 MR. FITZGERALD: Yes, which was  
17 interesting because when you talked to them, they  
18 didn't seem to account for any monitoring but when  
19 NIOSH looked at the records and matched up the  
20 names, they did find some bioassay data, which is  
21 good. But that sort of begs the question. We are  
22 sort of 50-50. The other two --

23 MR. DARNELL: Well, it follows the

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1 plant having these, doing medical monitoring,  
2 doing radiological monitoring for workers assigned  
3 to those projects.

4 MR. FITZGERALD: Yes.

5 MR. DARNELL: And whether or not --  
6 part of the problem that we continually run into  
7 and ask a worker did you do this kind of work and  
8 they may have done that kind of work but it was for  
9 non-radiological projects but they didn't know  
10 that.

11 MR. FITZGERALD: They weren't told.

12 MR. DARNELL: They weren't told. And  
13 they are so kept in the dark, it hinders some of  
14 the information that we can get from them  
15 accurately.

16 MEMBER LOCKEY: Do we know who those  
17 workers are?

18 MR. MCCLOSKEY: Yes, if you look at the  
19 latest paper that we posted on the website, our  
20 response, we give NOCTS members -- do you have  
21 access?

22 CHAIR BEACH: Is it the June 11th?

23 MEMBER LOCKEY: I guess the question is

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1 how many workers were involved with that.

2 MR. FITZGERALD: Yes, that is a  
3 different issue.

4 CHAIR BEACH: Yes, it is.

5 MR. FITZGERALD: We happened to find  
6 three or four workers that seemed --

7 MEMBER LOCKEY: But how many were  
8 involved with it? That is what I am asking.

9 MR. FITZGERALD: We don't know. It's  
10 not clear. We didn't see any records that carved  
11 out here is by task or assignment. How many  
12 workers did D&D or how many workers were devoted  
13 to cleaning up waste.

14 MR. MCCLOSKEY: Well and in the case of  
15 these four workers, you were able to identify, you  
16 went back to the records and found bioassay data.  
17 So, there may be additional bioassay data in the  
18 records, you just haven't accessed it or you don't  
19 know where to access them. Is that correct?

20 MR. MCCLOSKEY: Well, we don't know to  
21 go looking for Person X that was a D&D or a waste  
22 handler and see if there are in fact records for  
23 him. We only knew to go look for these four.

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1                   MEMBER LOCKEY:     I understand, but  
2                   there may be, in the records that have not be  
3                   searched for whatever reason, there may be  
4                   additional bioassay data.

5                   MR. MCCLOSKEY:    Sure.  Oh, yes, sure.

6                   MR. DARNELL:     Okay, we did a quick  
7                   review of people that were identified on some  
8                   specific access lists and we found bioassay data  
9                   on a lot of those folks.  And some of those folks,  
10                  during interviews, were telling us, we were never  
11                  monitored.  We never had bioassay.  We went and  
12                  found it because they were on specific lists.

13                  The remainder of workers, we just don't  
14                  know because we either haven't found them on a list  
15                  or they haven't been part of one of the different  
16                  things that we have done research in yet.

17                  MR. FITZGERALD:   That's kind of what we  
18                  are talking about, saying okay, we may be covered  
19                  but in case we do find some of these workers that  
20                  are established as being D&D or waste handlers,  
21                  they don't have records.

22                  What I think Mutty is saying is that  
23                  they would apply the coworker model of the uranium

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1 operators and that would be fine. They would apply  
2 that and that would be the dose they would get.

3 MEMBER LOCKEY: I think SC&A was asking  
4 whether that was adequate. If you have two  
5 bioassays of the four, is that adequate  
6 information?

7 MR. FITZGERALD: Yes, it wasn't clear  
8 from the response are we going to apply that which  
9 we find or is the uranium coworker model, which we  
10 kind of thought that was the case but we wanted to  
11 confirm that, that the uranium coworker model would  
12 be applied for those that don't have individual  
13 records because we batted 50-50 on the four. So,  
14 it is likely that some might not have any records.

15 But it is not easy to know how many  
16 actually did the small letter D&D or -- it wasn't  
17 something that was carved out very clearly. We  
18 were lucky, I think, to even find people that  
19 acknowledged they did that work.

20 MR. DARNELL: And the other thing to  
21 remember is some of this small letter D&D that was  
22 going on was on machinery or equipment that was  
23 never radioactive to begin with. The people that

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1 were doing the work never knew it.

2 It makes it more and more difficult,  
3 more challenging to find enough data to support the  
4 different positions we are trying to come up with.

5 MR. MCCLOSKEY: This logic applies to  
6 Issue 7 that we just --

7 MR. FITZGERALD: Yes. Yes, I think  
8 the questions are tied together.

9 Now, for the benefit of Joyce, we looked  
10 at the thorium aspect of that because, obviously,  
11 you have mag-thorium lathe operations and these  
12 issues apply equally to those but the value that  
13 was being proposed, as far as the bounding value  
14 for the reasons we discussed in the last  
15 discussion, are very conservative. So, if that is  
16 the bounding dose that is going to be applied, or  
17 the air concentration that is going to be applied,  
18 I don't think there is any question that would be  
19 bounding of what those folks would have been  
20 exposed to.

21 So, Joyce, this is the 1.5E-11  
22 microcuries per milliliter, that is the value that  
23 NIOSH is proposing as a bounding thorium

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1 concentration for D&D workers, as well as waste  
2 handlers, I would imagine.

3 MR. MCCLOSKEY: Yes.

4 MR. FITZGERALD: So, in both cases,  
5 that would be the bounding air concentration that  
6 would be applied for them, as far as any residual  
7 thorium.

8 DR. LIPSZTEIN: Yes. Why it is half  
9 the concentration you are going to apply to the  
10 regular workers?

11 MR. MCCLOSKEY: The regular workers  
12 being operators on TBD-6000 approach defined as  
13 four categories, operators, laborers,  
14 supervisors, and other. And so we evaluated their  
15 work and determined that the infrequency of the  
16 clean-out and the D&D would reduce their exposure  
17 to someone who was actually doing the machining  
18 continuously.

19 DR. LIPSZTEIN: Like for example,  
20 would you apply this limit for a continuous work  
21 during one year or for some time during the year?

22 MR. MCCLOSKEY: If they come to us with  
23 a claim, we determine if they are a mag-thorium

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1 worker that worked in the area for the entire year,  
2 they would get 2,000 hours of the 1.5E-11  
3 microcuries per milliliter exposure for those  
4 2,000 hours. All right?

5 DR. LIPSZTEIN: But that is not what  
6 you generally would do for the workers that they  
7 don't know what happened.

8 MR. MCCLOSKEY: For workers --

9 CHAIR BEACH: So, Joyce, the question,  
10 could you -- nobody understands your question.

11 DR. LIPSZTEIN: Okay.

12 CHAIR BEACH: So, for workers that you  
13 don't know what they did. Is that your question?

14 DR. LIPSZTEIN: Yes, because sometimes  
15 you know exactly when the worker was -- maybe they  
16 recall whether some data thing from March to April  
17 this person was in D&D in mag-thorium. But  
18 sometimes you don't know. They just say well, I  
19 have cleaned the mag-thorium floor.

20 One interview, for example, says he  
21 worked with mag-thorium and after that, he cleaned  
22 the machine and the floors and everything. They  
23 don't know for how long. Do you have all the data

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1 from when the cleanup was done? Because if you  
2 apply a limit of exposure to a worker, you have to  
3 know for how many hours you are going to apply  
4 during that year.

5 CHAIR BEACH: And how many years.

6 DR. LIPSZTEIN: So, what is the  
7 criteria for the number of hours that is going to  
8 be applied for each D&D worker?

9 MR. SHARFI: Well once they are put  
10 into the mag-thorium worker category, then they are  
11 going to get the entire exposure.

12 MR. FITZGERALD: I think what she is  
13 saying, though, is if you are not an operator but  
14 somebody who might have done some cleaning in the  
15 context of this issue, how would you --

16 MR. SHARFI: Reducing their hours.

17 MR. FITZGERALD: We are basically  
18 saying that they are working 2,000 hours in the area  
19 just at a reduced concentration.

20 MR. SHARFI: Right, okay.

21 CHAIR BEACH: So, that is for laborers,  
22 for the --

23 MR. SHARFI: I mean category

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1 adjustments are really adjusting -- well either you  
2 can look at it they are adjusting concentration  
3 because the work is less intense or you can say they  
4 are working -- they are adjusting the hours.  
5 Concentration versus time. So, however you want to  
6 look it.

7 MR. MCCLOSKEY: The intake per year.

8 MR. DARNELL: Basically, these workers  
9 are going to have medical records and training  
10 records to back up that they were in the area. We  
11 show that they were in the area, that is going to  
12 be their airborne exposure for the year.

13 MR. FITZGERALD: Yes, I think this gets  
14 into just the dose reconstruction, how one  
15 approaches the claims themselves, how you  
16 establish the time frames, the locations, and what  
17 work they did and trying to figure out what  
18 exposures to give them credit for. And then you  
19 would apply the values that you have in the paper.

20 So, the first part, though, is I think  
21 pretty standard: try and establish the worker's  
22 history, exposure history. Then, Joyce, they  
23 would apply the 1.5, which is the 50 percent of the

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1 three that we have been talking about.

2 DR. LIPSZTEIN: Because you know one of  
3 the interviews that I read, I don't know that is  
4 really Joe knows better because he interviewed the  
5 person, the individual himself. He said from what  
6 I understood from this summary, that he was, this  
7 person was involved in the cleanup of the  
8 magnesium-thorium area and they opened some  
9 machines to clean it but when they entered the area  
10 -- this is for the period of 1970 to 1979, okay,  
11 was the model shop.

12 MR. FITZGERALD: Right.

13 DR. LIPSZTEIN: There were other  
14 machines that were working with magnesium-thorium  
15 at a distance from other machines and that area was  
16 only roped with a caution tape but the area was open  
17 in the middle of everything.

18 CHAIR BEACH: Yes, Joyce, I happen to  
19 have that interview and I have it highlighted. So,  
20 we'll remember that.

21 MR. FITZGERALD: But again, if I think  
22 if that were the claim that was being submitted,  
23 that whoever was submitting the claim would get

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1 credit for the exposure potential for that area.  
2 I think you always you have to establish the  
3 exposure history and whether or not there was any  
4 exposure, in this case, to mag-thorium before these  
5 values would be applied.

6 But if the interviewee was a claimant  
7 and he indicated that the machinery, you  
8 established a time frame that the D&D took place  
9 and then you would give them the value.

10 But I think it goes through that process  
11 for every claimant.

12 MEMBER CLAWSON: Hey, Joe, this is  
13 Brad. You know I am kind of sitting here listening  
14 to this. I understand the point you are getting  
15 at. But if you remember most of these interviews,  
16 most of these people didn't even know what they were  
17 working with.

18 CHAIR BEACH: Right.

19 MR. FITZGERALD: Right, that is what  
20 Pete was saying.

21 MEMBER CLAWSON: They just went in and  
22 cleaned stuff. And when we start talking D&D, most  
23 of them didn't even understand, what do you mean

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1 D&D time period. We have the big D&Ds back there  
2 but that was done by Rockwell and everything else.  
3 These other guys, it was just another day in the  
4 park. I mean they just went in and did what they  
5 were told.

6 I am kind of with Joyce a little bit  
7 here, kind of wondering how we are going to pick  
8 out these people that we are involved with here.

9 MR. DARNELL: Like I said earlier, Brad  
10 and Joyce, the people that were assigned to this  
11 work had medical monitoring records. They have  
12 radiological training records. And they had other  
13 requirements that they had to meet for plant  
14 operations to be able to go into radiological  
15 areas. We have got a lot of documentation that  
16 shows that was the case throughout the site's  
17 history.

18 So, if they self-identify, I worked on  
19 magnesium-thorium, we are going to look at their  
20 medical records and their training records. And  
21 if they were in those areas the entire time that  
22 they say they were in the areas, they're getting  
23 that concentration.

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1           MR. FITZGERALD: I think Brad raises a  
2 question that we have been touching on, which is  
3 if somebody says they did D&D, and of course by  
4 definition, decontaminate and decommission, that  
5 suggests that they might have been involved in  
6 something to cleaning up a machine that had  
7 radiological contamination.

8           MR. DARNELL: To us it means cleaning  
9 up radiological contamination.

10          MR. FITZGERALD: Right.

11          MR. DARNELL: To a site like Kansas  
12 City, it could mean cleaning up anything.

13          MR. FITZGERALD: Well I think, though,  
14 he is broaching the question, this gets back to --

15          MR. SHARFI: I'll go farther and I will  
16 just say you don't talk to the worker, he has passed  
17 away, and we are talking to survivors. At that  
18 point, you know nothing.

19          MR. FITZGERALD: Right.

20          MR. SHARFI: And we still do get their  
21 medical monitoring information and they do  
22 identify like departments and some of the cards,  
23 we saw they did identify mag-thorium workers

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1 related to that department.

2 So, even if there is no interview  
3 process, we can identify workers that were part of  
4 the department and those people would get it  
5 regardless, whether they said it or not.

6 MR. DARNELL: As a matter of fact, the  
7 records were so clear that you can see timeframes  
8 the worker was qualified to go in the Department;  
9 he was disqualified for a little while, then  
10 requalified to go back in at another time. That  
11 is how detailed some of these records are that we  
12 have seen. Now, of course, we haven't looked at  
13 every single record, so I don't know that all  
14 records are the same but we would have to go back  
15 to those records for each individual worker that  
16 makes a claim so that we can be fair to all of them  
17 to give them as much credit for the exposure that  
18 they think that they have.

19 MEMBER LOCKEY: Well, records are  
20 precise enough that you can say if I was a laborer,  
21 my status as a laborer, I worked in  
22 decontamination, you can tell whether it was DU or  
23 mag-thorium.

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1 MR. DARNELL: Yes, it specifically --

2 MR. SHARFI: Medical cards do identify  
3 departments that they were part of.

4 MEMBER LOCKEY: So, you can get down to  
5 that precision based on the medical records.

6 MEMBER LOCKEY: We have actually seen  
7 DU qualifications. We have seen Department 20,  
8 Department 22. We have seen mag-thorium  
9 qualifications. We have seen model shop  
10 qualifications, all of the different areas that we  
11 have looked for, for radioactive material use, with  
12 the exception of the tritium stuff, we have seen  
13 on those cards.

14 On the bioassay portions of the medical  
15 sections, we have seen tritium.

16 MEMBER CLAWSON: I'm glad to hear that  
17 we have got that good of a record. So, what you  
18 are telling me is that if somebody had a Department  
19 20 acknowledgment on their medical card, then they  
20 get dosed.

21 MR. DARNELL: They get what?

22 MR. KATZ: They get dosed.

23 MR. DARNELL: Yes, that is the way we

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1 have it set up.

2 MEMBER CLAWSON: Okay, I'm just trying  
3 to get a better understanding of this. Because to  
4 be right honest with you, these are some of the  
5 better records of all the other sites we have found.  
6 Usually we have found holes in it and stuff like  
7 that. When push comes to shove, this is what I have  
8 found interesting about Kansas City was that they  
9 loaned the people out; they went from one side to  
10 the other. You know they just had a labor pool  
11 there. This is what I am wanting to make sure is  
12 we are getting to the right people, that they are  
13 supposed to get this dose and that we have a ways  
14 and a means to be able to do it.

15 MR. DARNELL: We feel pretty strongly  
16 that we are able to get to the right people that  
17 would give them the right doses but we are still  
18 looking, too, Brad.

19 MEMBER CLAWSON: Oh, I understand.  
20 I'm just -- I just want to better understand how  
21 we are going about this because you know as well  
22 as I do this is a difficult one because we have a  
23 whole other group or set of people that really

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1 aren't even working with any of this stuff.

2 MR. DARNELL: Yes.

3 MEMBER CLAWSON: And I understand  
4 this. I am trying to understand in my mind,  
5 looking at it, what I have seen, what I have talked  
6 to with people that look into the right people.  
7 Because many of these people didn't even know what  
8 they were working with and when we asked them, they  
9 give us this blank look. Then all of a sudden we  
10 find medical records that yes, they were set up to  
11 be able to work with this.

12 MR. DARNELL: Yes.

13 MEMBER CLAWSON: This is all I am  
14 trying to understand is how we are going to do it.

15 MR. DARNELL: Well, I think that you  
16 can rest assured that we are taking the most  
17 conservative approach that we can to ensure that  
18 we get the most people covered, giving them the  
19 benefit of the doubt as they got the dose.

20 MEMBER CLAWSON: And I understand that  
21 and I appreciate that. I am not criticizing you  
22 either. I am just for me trying to picture how we  
23 are trying to do it.

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1                   And I think you guys are doing a great  
2                   job. I just am looking at pieces of this so I just  
3                   want to make sure that I have a full picture. I'm  
4                   not criticizing in any way. I am just trying to  
5                   understand it myself.

6                   MR. DARNELL: Yes, I'm just trying to  
7                   make sure I answer all your questions right.

8                   MEMBER VALERIO: So, my question was  
9                   whether or not there were training records found  
10                  by NIOSH which Pete touched on before I had a chance  
11                  to ask the question. So, I think that that  
12                  clarifies it in my mind that they did have some type  
13                  of training before entering this specific  
14                  building, whether it was D&D or machining or  
15                  whatever operation they were actually --

16                  MR. DARNELL: Remember, it is not  
17                  actually entering a specific building. It is  
18                  entering a specific area of a huge building.

19                  MEMBER VALERIO: Okay. So, 22 is  
20                  within Department 20. Is that right?

21                  MR. DARNELL: Yes, it was basically the  
22                  same area. Sometimes it was called Department 20.  
23                  Sometimes it was called Department 22. Sometimes

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1 it was 22D, going down to the specific parts. And  
2 that was an area within two areas.

3 CHAIR BEACH: Yes, and Pat has a map to  
4 that. He can show you the different areas. I know  
5 you weren't at the last meeting in person to see  
6 that map. Or at least he had it yesterday.

7 MR. MCCLOSKEY: Yes, I have it.

8 CHAIR BEACH: Okay.

9 MR. DARNELL: Just for everybody's  
10 information, in the ER on page 35 of 70, Table 6-4  
11 has all the different occupation descriptions that  
12 we went over and bioassay measurements for the  
13 descriptions in general. So you can see even that  
14 they were doing a lot of bioassay over a lot of  
15 different job descriptions.

16 CHAIR BEACH: All right. Are there  
17 any other questions or comments? No.

18 So, for recap, let's recap and I will  
19 try to do this. Joe will step in and help me out  
20 if I muck it up too much.

21 So, we are looking to apply the dose  
22 through a coworker model for laborers, anyone that  
23 was described as a mag-thorium worker -- I'm

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1 probably not saying this quite right.

2 MR. FITZGERALD: Well, I think what we  
3 were saying, or what Mutty was saying is that for  
4 the waste handlers and D&D workers who handled  
5 uranium, if they didn't have individual data, which  
6 they may very well have, but they didn't have it,  
7 that you would apply the uranium coworker model for  
8 them for the appropriate years of course, for the  
9 right years.

10 And if it involved the mag-thorium, in  
11 terms of thorium, it would be one-half of the 3.0,  
12 which would be the 1.5, which is still very  
13 conservative. We just went through that whole  
14 discussion of how 3.0 is very, very conservative.  
15 This is very conservative.

16 CHAIR BEACH: Which is listed in your  
17 White Paper.

18 MR. DARNELL: Yes. So, I said in our  
19 response that we understood the degree of  
20 conservatism and still, we are okay with the 1.5  
21 in this case. We were a little fuzzier on the  
22 uranium but I think we are satisfied with the use  
23 of the coworker model for those that don't have

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1 individual data.

2 CHAIR BEACH: Okay.

3 MR. DARNELL: So are we going to rely  
4 on coworker models for I guess Issue 17 and Issue  
5 7?

6 CHAIR BEACH: Yes.

7 MR. DARNELL: Both of those should be  
8 transferred over to the TBD.

9 CHAIR BEACH: I think we wanted to  
10 wait, hold off on that until we saw your --

11 MR. FITZGERALD: The fire issue. Oh,  
12 no, not the fire issue.

13 CHAIR BEACH: No, the dose  
14 reconstruction examples. Yes, so I think we are  
15 close but we would like to see that. So, for Issue  
16 13, the mag-thorium and then the D&D and waste  
17 handlers, how that is going to look as a sample.

18 MR. DARNELL: Since we have agreed on  
19 the numbers and the approach, then we can do the  
20 sample.

21 CHAIR BEACH: You can do the sample.  
22 Okay.

23 MR. SHARFI: I guess you are going to

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1 go back to if you want the approach for the  
2 unmonitored -- if you want the example, are you  
3 wanting me to us the current, given that we are  
4 going to validate -- as part one, we are going to  
5 be talking about validating the coworker study.  
6 At one end as an example an ER with a coworker that  
7 hasn't yet been relooked at or are you willing to  
8 wait for Issue 1 to be resolved?

9 CHAIR BEACH: I think we need to  
10 resolve Issue 1.

11 MR. SHARFI: Okay.

12 CHAIR BEACH: Okay. So, just for  
13 recap, so we are done with Issue 13 and 17.  
14 Anything else we need to discuss on Issue 7 or is  
15 that covered, I believe?

16 MR. DARNELL: Part and parcel of what  
17 we just talked about.

18 CHAIR BEACH: Okay. So, we will break  
19 at this time for a break and then Ron should be back  
20 with us and we will go ahead and move to Issue 11  
21 when Ron comes back and then go back to the top at  
22 Issue 1, so everybody is ready.

23 MR. KATZ: How long a break?

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1 CHAIR BEACH: What have we got? Let's  
2 take until 11:05 or so. A ten-minute break.

3 MR. KATZ: Ten-minute break.

4 MR. Fitzgerald: And Joyce, you don't  
5 have to hang in. We are trying to take care of you  
6 and Ron so you don't have to stay on the phone all  
7 day.

8 CHAIR BEACH: Yes, thank you, Joe.

9 (Whereupon, the above-entitled matter  
10 went off the record at 10:54 a.m. and resumed at  
11 11:10 a.m.)

12 MR. KATZ: Okay. We are back online.

13 CHAIR BEACH: Bob, have you rejoined  
14 us?

15 (No response.)

16 CHAIR BEACH: Or Bob. Excuse me, not  
17 Bob. Pardon me. Ron, are you back with us?

18 (No response.)

19 MR. KATZ: Maybe not.

20 CHAIR BEACH: No, okay. So, we were  
21 going to go to 11 but now we will go back up to the  
22 top of the list, Issue 1.

23 MEMBER CLAWSON: I'm here, Josie.

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1 CHAIR BEACH: Hi, Brad. We knew you  
2 would be there.

3 MEMBER CLAWSON: Oh, yes, sure. Okay.

4 MR. KATZ: That's why we didn't ask.

5 CHAIR BEACH: We knew for sure you were  
6 back. Okay, so we will just go ahead and go back  
7 up to Issue 1, which is the data adequacy and  
8 completeness issue. And NIOSH is prepared to talk  
9 about that. We are reshuffling.

10 MR. MCCLOSKEY: Well you keep bouncing  
11 around.

12 CHAIR BEACH: Yes, it is just part of  
13 what I do.

14 MR. MCCLOSKEY: Okay, Issue 1 is linked  
15 to Issue 9. And as a reminder, what these two  
16 issues are about is so NIOSH used a database of  
17 dosimetry information provided by the Kansas City  
18 Plant to build our coworker model that is in the  
19 TBD and that the ER references.

20 And for internal and external Issues 1  
21 and 9, a question came up that we should validate  
22 that database to compare to something like raw  
23 dosimetry records to see if it is a good database

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1 to be used.

2 And so we submitted a preliminary plan  
3 to SC&A from the Board where we suggest that we will  
4 use the existing NOCTS raw data. So, whenever a  
5 claim is filed, the site sends us photocopies of  
6 dosimetry records, and we use what we have and  
7 compare that to the database.

8 CHAIR BEACH: Okay, so when you are  
9 talking about the database, you are talking about  
10 the DOE-supplied records and you are comparing the  
11 raw records to that database. Is that correct?

12 MR. MCCLOSKEY: Yes. So, this is a  
13 printout of what you can see. The database was  
14 provided to us and it is referenced --

15 CHAIR BEACH: That's from DOE.

16 MR. MCCLOSKEY: It came right from the  
17 Kansas City Plant. Yes, the DOE. And this is a  
18 page from it. And I took away the Social Security  
19 numbers.

20 But the columns look like that. You  
21 have the year that that employee worked. So, this  
22 employee worked from '58 to '59. That is one  
23 employee. The next column would have been their

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1 Social Security number.

2 And then reading across, it shows the  
3 beginning date of monitoring, the ending date of  
4 monitoring for that person, separate line items.  
5 And then it has columns for deep dose, eye dose,  
6 neutron dose, shallow dose, ring dose, those are  
7 the dosimeters you wear on your fingers. And then  
8 it has internal for uranium only in micrograms per  
9 liter. This is something that Ron Buchanan looked  
10 at and we covered in another issue about what do  
11 all these values mean; how do we use them for DRs?

12 But so this is what we need to validate  
13 it. It goes on. There is over 18,000 records in  
14 there. I only got two pages.

15 And so from the NOCTS raw records, if  
16 you go in NOCTS and say you pull up a claim number,  
17 I have it listed here, I won't say it, but you would  
18 find a bunch of raw records such as this one. I  
19 blacked out the Privacy Act stuff.

20 And what we have begun doing already,  
21 we have our data ready group, they have started  
22 compiling information for each one of these records  
23 and building a spreadsheet. This is an example of

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1 it.

2 So, this employee with this record, it  
3 was entered here. And what this compilation will  
4 do, it will have the NOCTS number in the farthest  
5 column. It will have the Social Security number  
6 as well, as we are able to positively marry a record  
7 from the NOCTS files to the database with Social  
8 Security numbers in. And there are names  
9 available for the database personnel as well. So,  
10 we can get a good match there.

11 The next column shows you exactly where  
12 -- I moved it over so you can't read it all now  
13 but it shows you where in NOCTS you can find this  
14 exact record, what page number. So, if anybody  
15 wanted to go back and check how we entered  
16 information from the raw record to our compilation  
17 they can do that.

18 And then we have a start and stop date  
19 for the employee for that monitoring. So, this  
20 whole grayed out section at the top is one employee,  
21 all his records. Then the next one starts here and  
22 it goes all the way down to here. That is all one  
23 employee. And so the highlighted ones there are

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1 where this data was entered for that person.

2 And we are copying the data from the raw  
3 records exactly how the site described it, if they  
4 described it in rads, rem, or roentgen, or X or Y,  
5 or neutron, ring doses, shallow doses, however they  
6 described it, we were capturing it exactly the way  
7 they described it.

8 And then once that is compiled, we will  
9 do a comparison with the data records. And so I  
10 guess SC&A had a question about what portion or  
11 percentage of sampling do you intend to do. I  
12 think we got agreement that they are using existing  
13 raw data that you have already and it seems like  
14 a good approach to validate the database but  
15 exactly how much of that will be used.

16 MR. FITZGERALD: That is a standard  
17 question because we have done it in the past, where  
18 we have done it very statistically based and we have  
19 done it sort of let's do 30 or 50. And that was  
20 just a clarification question, what kind of  
21 sampling were you intending to do.

22 MR. MCCLOSKEY: I can say that you know  
23 Dr. Lockey brought up the question in January about

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1 a priori parameters, you know what is acceptable  
2 error rate and things like that. A number of these  
3 questions are being worked on in a program-wide  
4 guidance for coworker modeling.

5 There is going to be next week, in  
6 Brad's hometown, we are going to have the  
7 presentation prepared in Idaho from Dr. Neton and  
8 Dr. Melius about this coworker effort. You know  
9 so that is being worked on program-wide. It is not  
10 something you just choose for each individual site.  
11 We feel that guidance should be somewhat universal.

12 MR. FITZGERALD: So this coworker  
13 approach will be subject to the new guidelines.

14 MR. MCCLOSKEY: Oh, absolutely.

15 MR. FITZGERALD: Yes, so we're just  
16 going to have to make sure that this is consistent.

17 MR. MCCLOSKEY: So, it kind of hard to  
18 answer entirely.

19 And you know so we have started  
20 compiling it and there is a lot to do. And so we  
21 are going to just down that path going after all  
22 of the NOCTS records at the moment and I talk about  
23 how many there are.

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1                   MR.    FITZGERALD:           Six    hundred  
2    ninety-one.

3                   MR.    MCCLOSKEY:    It's  somewhere,  I'm  
4    sure  you  are  right.  And  we  are  going  to  see  where  
5    that  gets  us.

6                   CHAIR  BEACH:    Yes,  you  said  in  your  
7    paper  691  NOCTS  claims  currently  available.

8                   MR.    MCCLOSKEY:    Right  and  I  break  it  
9    down  into  external  and  internal.

10                  CHAIR  BEACH:    There  are  223  external.

11                  MR.    MCCLOSKEY:    Yes.

12                  MR.    FITZGERALD:    So  the  NOCTS  claim  
13    file  has,  as  you  were  pointing  out,  the  actual  
14    source  records  there.

15                  MR.    MCCLOSKEY:    Yes,  you  can  click  on  
16    the  DOE  supply  response.

17                  MR.    FITZGERALD:    Because  in  the  past  we  
18    found  that  --  of  course,  we  have  gone  back  and  done  
19    V&V,  the  validation  and  verification  was  that  in  
20    a  lot  of  cases,  DOE  never  validated  the  electronic  
21    database  against  the  original  source  records  and  
22    the  contractor  never  did.  So,  it  just  turned  out  
23    that  since  nobody  down  the  chain  had  done  it  --

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1 CHAIR BEACH: Hang on just a sec.  
2 Everybody on the phone may have lost connection.

3 MR. FITZGERALD: Oh.

4 MR. KATZ: Okay. I'm sorry this is an  
5 interruption but Brad has been disconnected. And  
6 you are sure you dialed the number right? Because  
7 I don't know how that could be.

8 MR. MCCLOSKEY: Is everyone else  
9 hearing us now?

10 CHAIR BEACH: Is there anyone on the  
11 line that can hear us right now?

12 MR. BARTON: Yes, this is Bob Barton.  
13 I'm still here.

14 CHAIR BEACH: Thanks, Bob.

15 MR. KATZ: Everyone else is still  
16 connected, Brad. So, keep trying. Okay, bye.

17 CHAIR BEACH: Well when you said  
18 everybody was disconnected --

19 MR. KATZ: No, Brad is disconnected and  
20 he is trying to call in and it is not working for  
21 him.

22 CHAIR BEACH: Okay.

23 MR. KATZ: I was worried he wouldn't be

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1 able to.

2 CHAIR BEACH: Do you want us to just  
3 wait a couple of minutes and let Brad get back on?

4 MR. KATZ: We're off the record.

5 (Whereupon, the above-entitled matter  
6 went off the record at 11:20 a.m. and resumed at  
7 11:21 a.m.)

8 CHAIR BEACH: Brad, are you back with  
9 us?

10 MEMBER CLAWSON: Yes. Yes, I am.

11 CHAIR BEACH: Thank you. Okay, so we  
12 interrupted Joe. So, hopefully, Joe can go back  
13 and recap where he was.

14 MR. FITZGERALD: Brad, this is for you.

15 MEMBER POSTON: Pay attention, now.

16 MR. FITZGERALD: I was saying before,  
17 the reason I really focused on clarifying whether  
18 the raw records were available through NOCTS is  
19 that the issue we have had in the past is that for  
20 some sites, the validation had not been done by  
21 either the contractor supplying the electronic  
22 records that were presumably transcribed from raw  
23 and DOE had not done any QA to go back and do the

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1 same thing. So, the records that were arriving for  
2 NIOSH use had not been QAed all the way down. So,  
3 sort of a standard of practice, unless there is some  
4 documentation that that was done by either DOE or  
5 the contractor would be just to do that sampling  
6 to validate that the electronic version can be  
7 married up to the raw record.

8 So, the clarification there was just to  
9 make sure that when you said DOE-supplied records  
10 for NOCTS that that included the source documents,  
11 the source records. If that is the case, we are  
12 fine. Then it is just a question of, as you say,  
13 on a coworker, what sampling fraction -- that's  
14 fine.

15 MR. MCCLOSKEY: Yes, there is an  
16 example of one of the source documents.

17 MR. FITZGERALD: Right. It wasn't a  
18 second generation. The record was actually source  
19 records that were included. So, we are fine with  
20 that.

21 MR. MCCLOSKEY: All right.

22 MR. FITZGERALD: So, we will wait for  
23 the guidelines that would be applied for the

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1 coworker model for KCP as well as the other sites.  
2 That is something we can wait for. That is still  
3 in process.

4 CHAIR BEACH: Yes. All right.  
5 Anything else, Pat?

6 MR. MCCLOSKEY: I was just going to say  
7 that is on the agenda for next Thursday and Brad's  
8 time is at 9:30 in the morning.

9 CHAIR BEACH: Yes.

10 MR. FITZGERALD: Yes.

11 CHAIR BEACH: All right, I'm just  
12 making a quick note.

13 Any other comments or questions on this  
14 issue?

15 MEMBER CLAWSON: No, I appreciate you  
16 allowing me to hear it again.

17 MR. FITZGERALD: Just for you.

18 CHAIR BEACH: Anything for you, Brad.  
19 You know that.

20 MEMBER CLAWSON: Thank you.

21 MEMBER LOCKEY: I take option. I'm  
22 not sure about that, Brad.

23 CHAIR BEACH: Okay.

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1 MR. FITZGERALD: We have a naysayer.

2 CHAIR BEACH: All right, anybody in the  
3 room, Work Group Members, questions or comments on  
4 this? Everybody is --

5 MR. MCCLOSKEY: That is two issues  
6 right there.

7 CHAIR BEACH: That is 9 and -- 1 and 9.

8 MR. MCCLOSKEY: Is Ron back with us?

9 CHAIR BEACH: And Ron, are you back  
10 with us? Ron Buchanan.

11 DR. BUCHANAN: Yes, I just came back.

12 MR. MCCLOSKEY: Perfect timing.

13 CHAIR BEACH: Wonderful. We are going  
14 to go ahead and start with your issue, if you are  
15 ready, Issue 11.

16 DR. BUCHANAN: Okay. This is Ron  
17 Buchanan of SC&A. And this is an issue that we have  
18 covered in the past and that was the neutrons at  
19 Kansas City Plant. And, obviously, there wasn't  
20 a lot of neutron exposure but there was some  
21 radiation-generating 14-MeV neutron generators  
22 and a few of the solid state UV sources and such.

23 And so they did have NTA film monitoring

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1 there and we investigated whether it was able to  
2 detect the doses potentially received. And we  
3 originally objected to using the method that NIOSH  
4 suggested. And they went back and looked at it and  
5 said yes, okay, we agree. And so they came back  
6 with a plausible method.

7 And there was monitoring and this  
8 consisted of the monitoring at Kansas City. They  
9 had over 2,000 neutron badges read and only a few  
10 of them, about 34 or 35 of them had any positive  
11 dose and most of them were less than 0.1 rem. There  
12 was only three greater than 0.1 rem. And so they  
13 used a favorable method by looking at the 95th  
14 percentile of that and that came out to .154 rem  
15 per year and they will assign that to workers that  
16 were potentially exposed to neutrons at Kansas City  
17 Plant. So, we agreed that that is a  
18 claimant-favorable method and that we suggested  
19 that the issue has been addressed and that the Board  
20 consider closing that issue.

21 CHAIR BEACH: Okay, thank you, Ron.  
22 And everybody should have got the memo dated April  
23 21, 2015 with Ron's write-up on this issue.

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1                   Questions for Ron from the Work Group  
2 Members? And this was written up 11 and 12; 12 was  
3 actually closed at the January 20th meeting.

4                   Hearing no questions, NIOSH, you are in  
5 agreement, I assume?

6                   MR. DARNELL: Reluctantly so.

7                   CHAIR BEACH: Reluctantly, okay. So,  
8 at the advice of SC&A and no questions, I would say  
9 that we should go ahead and close Issue 11, based  
10 on the report from SC&A. Is everybody in agreement  
11 with that? Heads shaking yes.

12                  MEMBER CLAWSON: This Brad, yes.

13                  CHAIR BEACH: Brad, thank you. So,  
14 Issue 11 is now closed. That was easy. Thank you,  
15 Ron.

16                  DR. BUCHANAN: Okay.

17                  CHAIR BEACH: Okay, so just kind of a  
18 recap. So, Issue 2 is a TBD issue. Issue 3, the  
19 last meeting we closed 4, 5, 6, 8. Issue 10 is a  
20 TBD. Issue 11 we have now closed. Issue 12 was  
21 closed at the last meeting. Issue 14 and 19 were  
22 also both closed at the last meeting.

23                  That brings us to Issue 15. And we have

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1 already discussed 13. So, this is the thorium  
2 oxide.

3 MR. FITZGERALD: This is the thorium  
4 oxide and this is the infamous NMMSS issue. When  
5 I looked at the classified database, it had two  
6 listings for thorium, alloyed and unalloyed. And  
7 so the effort was trying to figure out if the  
8 unalloyed -- the alloyed was clear. That was  
9 mag-thorium. But the unalloyed, that was  
10 suggestive of possibly thorium oxide beyond the  
11 site, even though the documentation suggested  
12 otherwise.

13 So, a lot of it was just simply trying  
14 to find some information on-site that would explain  
15 why NMMSS seemed to have two listings that way.  
16 And it took a while. But actually in the end, in  
17 the March on-site visit, we came across the  
18 precursor documentation, the documentation that  
19 was used to compile the NMMSS, which is actually  
20 kind of what I was looking for.

21 And very clearly, in that  
22 documentation, what they had done at Kansas City  
23 is done two calculations. They certainly had the

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1 estimate for the mag-thorium. They went ahead and  
2 calculated how much actual pure thorium that would  
3 represent and they submitted both values to DOE,  
4 which as you can imagine, would be a source of some  
5 confusion because that is actually listed. Both  
6 are listed in NMMSS. So, anyone looking at that  
7 would think there was more thorium than there  
8 actually was. So, it was double-bookkeeping in a  
9 sense, but that explains why there was two listings  
10 for alloyed and non-alloyed. The non-alloyed is  
11 just simply an estimate that was done to come up  
12 with what that represented in terms of pure  
13 thorium.

14 MR. MCCLOSKEY: And the years marry up  
15 perfectly.

16 MR. FITZGERALD: Yes, so I went back  
17 and took some values that Kansas City provided me  
18 and compared that by year with what was in NMMSS  
19 and it matched up pretty exactly. So, that issue  
20 went away but for a while it just seemed like a loose  
21 end because it certainly suggested there was  
22 something in the way of an alloyed thorium.

23 So, that is one and the same. So, I

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1 would recommend the Work Group close that.

2 CHAIR BEACH: Yes, any comments or  
3 questions on that issue? That was the final thing  
4 that we needed to work out regarding that issue.

5 So, I would recommend that the Work  
6 Group take SC&A's advice and close Issue 15. Any  
7 questions? Does everybody agree?

8 Brad?

9 MEMBER CLAWSON: Yes.

10 CHAIR BEACH: Okay, so Issue 15 we are  
11 closing.

12 Okay, Issue 16 was an issue, if you  
13 recall, that we discussed at the January 20th  
14 meeting. SC&A, at that time, recommended closure.  
15 NIOSH agreed with that. However, the Work Group  
16 was not quite ready to let go of that issue. We  
17 were looking for validation on the proposed  
18 application of TBD-6000. We asked for some maps  
19 so that we could validate the different areas where  
20 rad work was being done at the site. Those maps  
21 were delivered to us in March.

22 So, really, this is a Work Group  
23 discussion on where you want to go with this issue.

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1 We do have recommendation for closure.

2 So, I'm looking to the Work Group for  
3 discussion. Brad, do you have any other issues?

4 MEMBER CLAWSON: No, I don't, Josie.  
5 I think we've about run this to ground.

6 CHAIR BEACH: Yes, I agree with that.  
7 How about other questions or comments, Work Group  
8 Members?

9 So, we are in agreement with closing.  
10 Okay, so we are closing Issue 16 as well.

11 Okay, so, that brings us to Issue 18.  
12 And this was another issue. We were looking for  
13 other incidents. There is quite a history on this  
14 one. I am going to let Joe speak to it, if he  
15 doesn't mind.

16 MR. FITZGERALD: No.

17 CHAIR BEACH: We are looking for  
18 incidents. Our March visit was one that we used  
19 quite a bit of time looking for incidents at the  
20 plant. And Joe, I will let you --

21 MR. FITZGERALD: Yes, this issue came  
22 from our reviewing the ER. And there were two  
23 admittedly major incidents, the promethium and

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1 what was the other one?

2 MR. SHARFI: Erbium tritide.

3 MR. FITZGERALD: Erbium tritide,  
4 right. Those were the two that were cited in the  
5 ER.

6 And our reservation at the time was we  
7 felt that, given the lengthy history of the plant  
8 that that seemed to be a short list of what may have  
9 been a longer list of what radiological incidents  
10 they had at the plant.

11 And so in the ensuing year or two, we  
12 wanted to shake the tree to see if there were other  
13 records of radiological incidents taking place.  
14 And iteratively, I think we have added NIOSH and  
15 certainly we have added through research, a number  
16 of files that contain more incidents but they still  
17 stand as the two major ones. That hasn't changed.  
18 And there certainly is a better record, I think,  
19 of other incidents.

20 Our concern of maybe overlooking  
21 something of substance that would contribute to the  
22 understanding of the plant, I think what we were  
23 able to validate was, no, there wasn't a large

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1 history of contaminations and whatnot that would  
2 give one pause about the ER's premise. And so, I  
3 think we are satisfied.

4 I wanted to look at the classified files  
5 as well, make sure there was nothing in there, which  
6 I did in Germantown I guess back in May. So, I  
7 didn't see anything else that would add to that,  
8 make a difference, in other words.

9 So, I think, what I would say to the Work  
10 Group is I think the documentation on incidents is  
11 much better than it might have been a year or two  
12 ago and we are pretty satisfied that is about as  
13 complete as one can get at this point.

14 We were kind of hopeful that we would  
15 find more weekly activity reports. For a while  
16 there was a glimmer of hope that we found a couple  
17 years and there would be a whole history of these  
18 weekly activity reports. It turned out we only  
19 found I think four years' or so worth.

20 But even in those four or five years'  
21 worth, there was a pretty rich documentation of  
22 what was going on week to week in terms of even small  
23 minor incidents: fires, what have you. Nothing

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1 that were really significant or eye-catching  
2 radiological incidents.

3 So, I think the group, collectively,  
4 had worked pretty hard to make sure that there  
5 wasn't anything that was unreported, undocumented,  
6 that would be of benefit to the ER. And I think  
7 we can report today that we have not found anything  
8 substantial. I think the record is better but  
9 nothing substantial that would change anything.  
10 So, that is kind of where we are at.

11 And we also spent a great deal of time  
12 talking to workers as well as to the petitioners,  
13 just trying to unpack anything that would represent  
14 an overlooked event, incident, what have you. We  
15 heard a little bit of this yesterday that we are  
16 pretty confident that there isn't anything like  
17 that that has been overlooked. That's where we  
18 are.

19 CHAIR BEACH: Okay. There was also  
20 one issue that I was -- I know NIOSH ran it down  
21 -- a petitioner issue. NIOSH ran it down. I ran  
22 it down, trying to find some extra information  
23 about a source that was uncovered and we didn't get

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1 anywhere with that either.

2 So, I am going to agree that we can close  
3 Issue 20 -- or excuse me, 18.

4 Brad, any comments or concerns on that  
5 recommendation?

6 MEMBER CLAWSON: No, we have done all  
7 we can. We have tried to address it. I feel good  
8 about it.

9 CHAIR BEACH: Other Work Group  
10 Members?

11 MEMBER VALERIO: I think we can close  
12 it.

13 CHAIR BEACH: Okay. So, we will go  
14 ahead and close 18 as well.

15 So, our last issue is the tritium and  
16 nickel. Let's go ahead and go through.

17 MR. MCCLOSKEY: Yes, I think I can do  
18 it, unless --

19 CHAIR BEACH: It is Issue 20. It is  
20 the tritium and nickel. The last White Paper on  
21 it was the May 7th NIOSH's update answering SC&A's  
22 --

23 MR. MCCLOSKEY: Okay, I will read

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1 SC&A's review -- I mean summary first.

2 MR. FITZGERALD: Summary of your  
3 summary?

4 MR. MCCLOSKEY: Yes. So, in Rev 01 to  
5 its paper, these are from SC&A's memo, tritium  
6 nickel-63 at Kansas City Plant -- May 7, 2015 is  
7 the date of that White Paper. NIOSH has added more  
8 details regarding the operational history of  
9 tritium use at Kansas City Plant and has added a  
10 last page that identifies an upper-bound dose  
11 estimation in millirem per year for each identified  
12 tritium and nickel-63 operation at Kansas City  
13 Plant.

14 And SC&A's staff's comments on that  
15 paper are, while the more specific treatment of  
16 bounding doses for each operation is helpful, NIOSH  
17 does not explain how that dose will be used in dose  
18 reconstruction, i.e., to whom it would be applied,  
19 parenthetical, only workers identified as handling  
20 tritium, all workers from certain parts of the  
21 Kansas City Plant, for example, laboratory, or all  
22 workers at Kansas City Plant during those specific  
23 timeframes. So, that is their question.

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1           A teleconference was held on June 29,  
2           2015 to clarify possible avenues to performing  
3           sample ERs to validate that these bounding doses  
4           can be applied to a defined worker category.

5           For nickel-63, SC&A concurs with  
6           NIOSH's bounding analysis showing no external  
7           exposure potential and a bounding annual dose of  
8           0.02 millirem per year, which the Work Group may  
9           consider negligible exposure.

10           So, that is SC&A's position or comments  
11           at the moment.

12           So, our response would be that the White  
13           Paper that SC&A referenced describes two  
14           scenarios, the high-low switchplate and tritium  
15           monitor operations. NIOSH can use those scenarios  
16           to bound tritium exposures. NIOSH can assign  
17           these doses to all claims submitted as follows.  
18           And these dates are in that White Paper, the dates  
19           that those exposure scenarios or bounding  
20           scenarios are applicable to.

21           From January 1, 1959 through December  
22           31, 1975, all claims submitted should be given 6.66  
23           millirem per year. And from January 1, 1963

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1 through December 31, 1968, all claims submitted  
2 will be assigned 1.77 millirem per year.

3 There is some overlap there. And for  
4 those years that overlap, which are 1963 to 1968,  
5 NIOSH will add the doses and assign 8.43 millirem  
6 per year.

7 MR. FITZGERALD: That's all workers,  
8 all claims.

9 MR. MCCLOSKEY: All claims. It is  
10 such a small amount, the highest it gets is 8.43  
11 millirem per year, if you use that bounding method  
12 that we have already presented.

13 MEMBER POSTON: Why do they quote so  
14 many figures? My God, the 8 millirem is probably  
15 the right estimate.

16 MR. MCCLOSKEY: That's me. That's my  
17 fault. That is the way it was calculated in the  
18 paper. The significant figures is what you are  
19 saying.

20 MEMBER POSTON: Yes, it is an estimate.  
21 You have a model. All models are wrong, some are  
22 useful, you know.

23 MR. FITZGERALD: Just going back on the

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1           timeframes. I know there was some ambiguity about  
2           the tritium bottling at the time. I don't recall,  
3           was that nailed down a little better as far as what  
4           time periods would be recognized as the tritium  
5           bottling time periods?

6                        Because I know that we had originally  
7           found that in the weekly activity reports but the  
8           term during which that was done wasn't clear at that  
9           time.

10                      MR. MCCLOSKEY: Yes, it even is a  
11           little fuzzy. You know we say -- I should just open  
12           up and tell you what we say. It is in the White  
13           Paper, those dates.

14                      MR. FITZGERALD: I know I was just  
15           trying to find it.

16                      CHAIR BEACH: The dates that they  
17           ordered the stuff --

18                      MR. MCCLOSKEY: And I will direct you  
19           to the dates that I have used to establish that  
20           here.

21                      CHAIR BEACH: So, I think it began in  
22           1959 on page 10. Is that it?

23                      MR. MCCLOSKEY: So, on page eight,

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1 first paragraph, you can see that, based on the  
2 period during which it is known that switchplates  
3 were used, NIOSH assumes the tritium exposures  
4 occurred continuously between 1963 and 1968. So,  
5 that is the high-low switchplate scenario. That  
6 is the second one I listed there.

7 I started at January 1, 1963 and went  
8 to December 31, 1968. And so you can see defense  
9 of that date earlier in here. But what I was about  
10 to say is I rounded out, I think we rounded out to  
11 January first and December 31st there to capture  
12 those entire years.

13 And then for the other scenario, the  
14 longer one --

15 MR. FITZGERALD: The tritium bottling?

16 MR. MCCLOSKEY: Yes -- you can find the  
17 source of my dates on page 12 of the White Paper,  
18 second paragraph, closing statement.

19 To ensure claimant-favorability, it is  
20 assumed that some part of the decanting operations  
21 occurred in Kansas City Plant's Chemistry Lab every  
22 workday beginning in 1959 and ending in 1975.

23 MR. FITZGERALD: So, it would be

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1 January 1, 1979 or '59?

2 CHAIR BEACH: 1959.

3 MR. MCCLOSKEY: Yes, January 1, '59 and  
4 December 31, 75.

5 MR. FITZGERALD: For the --

6 CHAIR BEACH: Bottling.

7 MR. FITZGERALD: And the '75 end date  
8 was based on?

9 MR. MCCLOSKEY: Okay, let's go through  
10 how we got that. Bear with me, Joe. I will get  
11 us there.

12 MR. DARNELL: I'm just trying to find  
13 the basis for 1975.

14 CHAIR BEACH: Right.

15 MR. FITZGERALD: That was a question we  
16 had for a long time because we knew it began in the  
17 early '60s, if not earlier but the end date was  
18 unclear at the time.

19 CHAIR BEACH: Wasn't it based on when  
20 the items were purchased? I thought I read that.

21 MR. DARNELL: I brought it up  
22 electronically. There is only one mention of 1975  
23 on page 10 and one more on page 12.

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1 MR. MCCLOSKEY: Yes.

2 MR. DARNELL: Sorry, I guess we didn't  
3 put it in here. Was it an earlier iteration,  
4 maybe?

5 MR. FITZGERALD: I think the only  
6 reference I recall now, it is written here on page  
7 11, is that the market for those tritium counter  
8 instruments presumably ended by the early '70s,  
9 when liquid scintillation counters became widely  
10 available. That was the rationale for why you  
11 wouldn't certainly be putting these kits together  
12 anymore but maybe '75 was just a conservative  
13 endpoint based on that.

14 MR. MCCLOSKEY: I'm not sure yet, Joe.

15 MR. FITZGERALD: Okay.

16 MR. MCCLOSKEY: I thought we had a  
17 better basis than that.

18 And I didn't know that was -- '75 was  
19 one of your sticking points.

20 MR. FITZGERALD: Not a sticking point.  
21 I think we were just looking for some hard edges  
22 on the dose reconstruction implementation.  
23 That's all.

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1 MR. MCCLOSKEY: Okay.

2 MR. DARNELL: It could have been in the  
3 previous paper. In the January paper, it talks  
4 about scintillation counters coming in.

5 MR. MCCLOSKEY: Yes, newer technology  
6 has arrived and we back away from this technology.

7 CHAIR BEACH: Okay, is that a question  
8 you want to come back to then --

9 MR. MCCLOSKEY: I suppose.

10 CHAIR BEACH: -- on why the end date was  
11 --

12 MR. FITZGERALD: It is sort of part and  
13 parcel of the dose reconstruction limitation and  
14 so it fits with everything else that you are coming  
15 back with. I think it is just a detail but since  
16 that was such a question mark early on, because we  
17 just had no idea how long they were doing this would  
18 be of interest, I think.

19 MR. DARNELL: Considering that we have  
20 not found that date any of the records, none of our  
21 keyword searches have been helpful in doing that.  
22 I think it might be of benefit just to come to a  
23 consensus.

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1           We know that in the early 1970s, the  
2           technology changed. We have picked 1975 for some  
3           reason. Right now we don't know what it is but it  
4           stands to reason that we have exhausted the  
5           possibility of finding it in the record. And what  
6           we need to do is come up with a consensus as to what  
7           is reasonable for a site for dose reconstruction  
8           purposes. That is a suggestion.

9           CHAIR BEACH: Right. And then did we  
10          determine who it was going to be applied to?

11          MR. MCCLOSKEY: Everybody.

12          CHAIR BEACH: So, everybody, because  
13          we can't pin down that it was just -- I know we  
14          talked about just lab techs but we couldn't pin down  
15          that it was just -- and it is such a small dose.  
16          Yes, I understand.

17          MR. DARNELL: It is a lot easier just  
18          to --

19          CHAIR BEACH: Yes, the last amount was  
20          purchased in 1970. Okay, so we will come back to  
21          that.

22                 There is still the sample dose  
23          reconstruction that you are going to do for this,

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1 so that question can be answered.

2 MR. DARNELL: You don't want to try to  
3 come to a consensus as a Work Group?

4 CHAIR BEACH: For?

5 MR. DARNELL: An end date.

6 MR. SHARFI: I would agree with Joe. I  
7 think, in fact, that '75 would cover all the early  
8 '70s.

9 CHAIR BEACH: Yes, I am okay with the  
10 '75. I think he was just wanting to know what  
11 brought you to that point.

12 MR. FITZGERALD: I think the basis of  
13 liquid scintillation counters going out -- or  
14 coming into vogue explains it. I don't have a  
15 problem with it.

16 CHAIR BEACH: Yes, just curious, more.

17 MR. MCCLOSKEY: Oh, I know. I wish I  
18 could land on something right now.

19 CHAIR BEACH: Yes.

20 MR. FITZGERALD: Given the amount of  
21 dose involved, it may not be worth it. It is up  
22 to the Work Group, obviously.

23 MR. DARNELL: If I'm allowed to make a

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1 motion, I will make a motion.

2 CHAIR BEACH: Okay.

3 MR. DARNELL: You said 1975 is the end  
4 date. Move on.

5 CHAIR BEACH: Okay, so any questions on  
6 NIOSH's White Paper from the Work Group? Brad,  
7 since you are on the phone, I will ask you.

8 MEMBER CLAWSON: No, not at that this  
9 time.

10 CHAIR BEACH: Okay, the rest of the  
11 Work Group Members, are you comfortable with that  
12 end date? Yes, I am comfortable with that as well.

13 This one, I am going to not close again  
14 because we are looking at the dose reconstructions  
15 that we had talked about.

16 MR. DARNELL: So, in our example dose  
17 reconstruction, everybody gets a tritium dose to  
18 December 31, '75.

19 MR. SHARFI: Yes, it just gets rolled  
20 into the environmental and TBD gets to determine.

21 CHAIR BEACH: Right. Okay,  
22 comfortable with that?

23 MR. SHARFI: Yes.

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1 CHAIR BEACH: All right, so everybody  
2 okay to move on to the Nickel-63?

3 MR. MCCLOSKEY: I suppose. I think we  
4 said that is negligible on the exposure.

5 CHAIR BEACH: Yes.

6 MR. MCCLOSKEY: We said it is, they  
7 said it is. I can say that number again if anyone  
8 wants.

9 MR. FITZGERALD: Yes, as two  
10 hundredths of a milligram, I think we can safely  
11 say that is negligible.

12 MR. MCCLOSKEY: Yes.

13 CHAIR BEACH: The nickel?

14 MR. MCCLOSKEY: Yes, 0.02 millirem per  
15 year.

16 CHAIR BEACH: So, for closure, let's --

17 MR. MCCLOSKEY: It wasn't its own  
18 separate issue.

19 MR. FITZGERALD: It was linked to the  
20 high-low plate.

21 CHAIR BEACH: Yes, it was. I think we  
22 just lost part of our Work Group Members.

23 MR. KATZ: You can go ahead and talk

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1 over them.

2 CHAIR BEACH: Okay. Yes, so, I will.

3 So, we are saying this is a negligible  
4 dose and nothing more to say on the nickel-63.

5 MR. MCCLOSKEY: I mean we have a paper  
6 there. We've run it down, we presented it to you  
7 guys.

8 MR. FITZGERALD: We reviewed the  
9 analysis and don't have any problems with the  
10 analysis.

11 CHAIR BEACH: Okay, so questions or  
12 comments from the work Group? Are you comfortable  
13 with what was written and reported?

14 Okay, so we can close that portion of  
15 the issue. Correct? It is not a separate issue,  
16 so it is not a separate --

17 All right, so we are done talking about  
18 nickel-63, then. Correct?

19 MR. MCCLOSKEY: Yes.

20 CHAIR BEACH: All right, so that ends  
21 our topics for discussion also.

22 Action items are pretty clear. Just  
23 the Issue 13, just tracking down that mag-thorium

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1 was not used based on the SRDB for the year '64.  
2 Did I miss any other actions?

3 MR. FITZGERALD: That is the one I had  
4 down.

5 CHAIR BEACH: That's the one I had,  
6 too. And, okay. And then the example DRs,  
7 correct.

8 All right, good work.

9 MR. KATZ: Very good work.

10 CHAIR BEACH: Very good work and very  
11 efficient.

12 MR. MCCLOSKEY: We got a lot  
13 accomplished.

14 CHAIR BEACH: Yes, we did.

15 MR. MCCLOSKEY: It will be interest to  
16 see if Brad thinks it was good work.

17 CHAIR BEACH: Brad?

18 MR. KATZ: Brad, did you hear that?

19 MEMBER CLAWSON: What's that? I  
20 didn't hear that.

21 CHAIR BEACH: Pat is concerned that you  
22 think that this was good work and are ready to move  
23 on to --

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1 MR. MCCLOSKEY: Bigger and better  
2 things.

3 CHAIR BEACH: Okay, so no other  
4 comments. I am going to go ahead and close the  
5 meeting at this time. Thank you, everyone, for all  
6 your hard work and attendance.

7 MR. KATZ: Have a good day.

8 CHAIR BEACH: Have a great day.

9 (Whereupon, the above-entitled matter  
10 went off the record at 11:53 a.m.)

11

12

13

14

15