

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

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ADVISORY BOARD ON RADIATION AND
WORKER HEALTH

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WORK GROUP ON MOUND

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THURSDAY
MAY 13, 2010

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The Work Group convened telephonically at 10:00 a.m. Eastern Daylight Savings Time, Josie Beach, Chair, presiding.

PRESENT:

JOSIE BEACH, Chair
BRADLEY P. CLAWSON, Member
ROBERT W. PRESLEY, Member
PHILLIP SCHOFIELD, Member
PAUL L. ZIEMER, Member

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ALSO PRESENT:

TED KATZ, Designated Federal Official
ISAF AL-NABULSI, DOE
BOB ANIGSTEIN, SC&A
JOE FITZGERALD, SC&A
EMILY HOWELL, HHS
KARIN JESSEN, ORAU Team
JEFFREY KOTSCH, DOL
JENNY LIN, HHS
ARJUN MAKHIJANI, SC&A
JOHN MAURO, SC&A
JAMES NETON, DCAS
BRANT ULSH, DCAS

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

(10:04 a.m.)

CALL TO ORDER AND ROLL CALL

MR. KATZ: Okay. Thank you, and welcome, everybody. This is the Advisory Board on Radiation Worker Health, Mound Work Group. I'm Ted Katz. I'm the Designated Federal Official of the Advisory Board, and we're going to begin the meeting with roll call, and please, for all Agency related participants, please state your conflict of interest situation in the roll call as well. Beginning with Board Members with the Chair.

CHAIR BEACH: I'm Josie Beach, Mound Chair. No conflicts with Mound.

MEMBER PRESLEY: Robert Presley, Working Group Member. No conflicts.

MEMBER ZIEMER: Paul Ziemer, Working Group Member. No conflicts.

MEMBER CLAWSON: Brad Clawson, Working Group Member. No conflict.

MR. KATZ: Okay. And Phil, any

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1 chance you've joined us yet?

2 (No response.)

3 MR. KATZ: Okay. Well, let's go
4 on to the NIOSH-ORAU Team.

5 DR. NETON: Jim Neton, NIOSH. No
6 conflict.

7 DR. ULSH: Brant Ulsh, NIOSH. No
8 conflict.

9 MS. JESSEN: Karin Jessen, ORAU
10 Team. No conflict.

11 MR. KATZ: Okay. SC&A.

12 MR. FITZGERALD: Joe Fitzgerald.
13 No conflict.

14 DR. MAKHIJANI: Arjun Makhijani,
15 no conflict.

16 DR. ANIGSTEIN: Bob Anigstein, no
17 conflict.

18 DR. MAURO: John Mauro, no
19 conflict.

20 MR. KATZ: Great. Welcome to you
21 all. And then, HHS and other government
22 officials, or contractors for the feds.

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1 MS. HOWELL: Emily Howell, HHS.

2 MS. LIN: Jenny Lin, HHS.

3 DR. AL-NABULSI: Isaf Al-Nabulsi,
4 DOE.

5 MR. KOTSCH: Jeff Kotsch, Labor.

6 MR. KATZ: Welcome to you all.

7 And finally, but not least, members of the
8 public. Any members of the public who would
9 like to identify themselves?

10 (No response.)

11 MEMBER SCHOFIELD: This is Phil
12 Schofield, Work Group Member, no conflict.

13 MR. KATZ: Oh, great. Glad you
14 could make it, Phil.

15 MEMBER SCHOFIELD: Thanks.

16 MR. KATZ: Okay. I haven't heard
17 any more, so please let me just remind
18 everyone to mute your phones. Use *6 if you
19 don't have a mute button. *6 to come off of
20 mute, and Josie, it's your agenda.

21 INTRODUCTION, BACKGROUND AND PURPOSE

22 CHAIR BEACH: Okay. Well, good

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1 morning everybody, and welcome to Mound's
2 first conference call. Our agenda for this
3 morning's meeting has been posted on NIOSH's
4 web site. The purpose of our meeting today is
5 to discuss NIOSH's proposed additions to the
6 SEC based on radon at Mound.

7 The Mound SEC petition covers
8 periods from February 1st, 1949 to August
9 17th, 2007. Radon is -- was identified as
10 item number two from the Mound Issues Matrix,
11 and is based on an assessment of the
12 following: NIOSH's Evaluation Report dated
13 December 19th, 2007, the Mound SEC petition
14 0090, and a partial review of documents, SC&A
15 Site Profile Review, and Working Group meeting
16 of April 1st, July 14th, October 27th, those
17 were in 2008, and then May 27th and 28th of
18 2009. And our most recent meeting, January
19 5th and 6th of 2010.

20 NIOSH formally conveyed by email
21 to me, on December 21st, 2009, that they had
22 been struggling with this issue for a number

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1 of weeks and had been unable to come up with a
2 suitable method for bounding radon doses for
3 individuals who were exposed to radon and
4 thoron and actinium, in room SW-19 at Mound.

5 They said that they were leaning
6 strongly towards recommending an additional
7 Class to the SEC for this scenario, and they
8 were going to discuss administration of the
9 Class Definition with DOL shortly.

10 NIOSH has reported that they have
11 been, and continue to work with DOL to come up
12 with a Class Definition that DOL can
13 administer, and as far as I know, this issue
14 is still currently unresolved, but that is
15 NIOSH's story to tell, and so with that, I'll
16 turn it over to NIOSH. And NIOSH will start,
17 followed by SC&A, and then of course the Work
18 Group questions. So, Brant, if you're ready,
19 take it over.

20 NIOSH DISCUSSION OF PROPOSED SEC CLASS

21 DR. ULSH: I'm ready. Thanks,
22 Josie. And actually, thanks for that

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1 timeline. That, that solves some of the
2 things that I needed to talk about.
3 Basically, to pick it up from the end of what
4 Josie said, last Friday, I think it was on
5 Friday, because there was a flurry of
6 activity, the Working Group should have -- and
7 SC&A should have received our Draft Evaluation
8 Report for radon.

9 Now one thing I need to clarify
10 here. For administrative reasons, that not
11 all of which, I'm sure I can explain, this
12 Class is an 83.14. So, basically it's one
13 that we are proposing. And I think that's
14 because in the original 83.13 Evaluation
15 Report, we said that we could do it, and
16 rather than go back and revise that, we just
17 initiated an 83.14 to cover the radon Class.

18 So, with that, when I sent that
19 out last Friday, I indicated that there was a
20 caveat, and that is that the exact wording on
21 the Class Definition is still being discussed.

22 So you shouldn't consider that final. And

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1 those communications have continued since last
2 Friday. I have been in contact with Jeff
3 Kotsch, and he is on the line, so we've had a
4 couple of rounds of question and answers back
5 and forth, and so they're still considering
6 the aspects of this that relate to how they
7 would administer the Class. So that is
8 somewhat of an open issue.

9 What we have proposed -- that is,
10 NIOSH -- is that the doses, the actual doses
11 that we cannot reconstruct, relate to leaks
12 from a tunnel that were under room SW-19. And
13 this tunnel, just to give you some
14 geographical perspective here, if you recall,
15 the first Class that we designated, from 1949
16 to '59, dealt with radium, actinium and
17 thorium separations activities that occurred
18 in what was called the old cave.

19 And there were some -- that was a
20 pretty messy operation, and at the end of that
21 operational period, they initiated some D&D
22 measures that eventually involved concreting

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1 in the whole facility -- that is, the old cave
2 facility. And that occurred, or concluded, in
3 1959. So that was the end of the first Class
4 Definition.

5 And subsequent to that, they put
6 office space up above the old cave facility.
7 And that office space is in room SW-19. And
8 in between, there are some tunnels, a tunnel
9 with a couple of different parts. Now, this
10 tunnel is not occupied. It's only, I think,
11 two feet and some inches in dimensions, in
12 terms of height. So it's not a tunnel that
13 people routinely access, or anything like
14 that. In fact, there's indications that it
15 was an isolated area, and that's why the radon
16 concentrations built up so high in that
17 tunnel.

18 The problem is, from 1959 up
19 through 1979, NIOSH has not discovered any
20 radon monitoring in this area. And that's
21 really the crux of the problem, why we're
22 recommending a radon Class. And now, let me

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1 clarify here. Unless I specify otherwise, in
2 this meeting, when I say radon, I'm not only
3 talking about radon-222, which is what you
4 would be most familiar with, but I'm also
5 talking about radon-219 and -220, and that is
6 actinon and thoron, respectively. And their
7 daughters. So it's a little bit different
8 than we might talk about, you know, with radon
9 in your basement.

10 So between 1959 and '79, we really
11 don't have any data. In 1979, if I can just
12 kind of give you a simplified timeline of the
13 events that we -- as we know them. In 1979,
14 an employee who had an office in SW-19 had a
15 strange lung count. It showed up with some
16 positive -- an indication of an intake in
17 strange places. And they did -- they
18 initiated an investigation based on that.

19 And we have the notes from the
20 health physicists who conducted the
21 investigation, and that's where I'm drawing a
22 lot of my data from. And, so that

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1 investigation happened, beginning on or about
2 June 19th, 1979.

3 And at that time, they became --
4 you know, when this employee showed up with a
5 strange count, they of course were interested
6 in where he could have picked up this intake.

7 And so they sampled in his office, and that
8 occurred in late June of `79. And they
9 sampled on the floor near his desk, and they
10 measured 66.8 picocuries per liter.

11 Now, at this point, they weren't
12 thinking about different radon isotopes. They
13 were thinking radon-222. So keep that in
14 mind. The next month, in July of `79, they
15 sampled from a hole in the floor in his
16 office, that they subsequently discovered, and
17 they measured 780 picocuries per liter at that
18 hole in the floor. And then they also measure
19 80.2 picocuries per liter near his desk, at
20 that time.

21 Now, to put this into perspective
22 a little bit, the, the RCG for a controlled

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1 area for radon is 100 picocuries per liter.
2 So at, at his desk, it's less than the RCG,
3 but at the hole in the floor, it's much higher
4 than the RCG. And that -- I hope the
5 importance of that will become evident as we
6 go along here.

7 All right. Let me see. Let me
8 find in my narrative here where I am.

9 MEMBER CLAWSON: Brant, this is
10 Brad. Where did, where did we get these --
11 because I didn't see these measurements from
12 the very beginning of this. Is this --
13 because when we interviewed this individual,
14 he didn't have these -- what the complete
15 limits were at. So I was just wondering,
16 where did we come up with this stuff?

17 DR. ULSH: These are from -- the
18 HP's transcribed their note, his note. His
19 handwritten notes that are in the SRDB, Brad.

20 And I transcribed them, because, you know,
21 they are a little difficult to read.

22 MEMBER CLAWSON: Okay.

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1 DR. ULSH: So I just made up a --
2 I typed his notes up for my own use. But his
3 handwritten notes are in the SRDB.

4 MEMBER CLAWSON: Okay. That's
5 what I wanted to know. Thanks.

6 DR. ULSH: Sure.

7 DR. MAURO: Brad, this is John
8 Mauro. Just to offer perspective. I seem to
9 recall a rule of thumb. Two hundred -- I
10 don't know if this is right. No. Two rem per
11 picocurie per liter to the lung. In other
12 words, if you're continually exposed to a
13 picocurie per liter, the dose to your lung --
14 now, not whole body dose, dose to your lung --
15 and this is radon, is I believe, two rem.

16 It's probably something that is
17 important to confirm. That's a number that
18 sort of sticks in my head. And I'm not sure
19 if I got it right. If anyone in the room --
20 it helps orient us in terms of the magnitude
21 of the insult of being exposed to radon, and
22 what levels are a problem, what levels may not

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1 be a problem. And I'd like to also point out
2 that in general, like the EPA guideline for
3 residences -- now, not occupational, is four
4 picocuries per liter.

5 DR. NETON: Right. John, this is
6 Jim. You have to keep in mind the statement
7 that Brant made early on, and it's -- they
8 were assuming, when they were making these
9 measurements, and these are with E-PERMS, that
10 it was one hundred percent radon-222.

11 DR. MAURO: Okay.

12 DR. NETON: These E-PERMS were not
13 calibrated for radon-219 or -220, so
14 essentially, these early measurements -- this
15 is part of the reason we have problems with
16 reconstructing anything here. We don't know
17 what those numbers mean.

18 DR. MAURO: Oh okay. I got you.
19 Okay.

20 DR. NETON: If you've got a, you
21 know, four second half-life radon-219, you've
22 got radon-220 in here, and so part of the

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1 confusion in this entire investigation was, it
2 took them quite some time to realize that it
3 was actually a mixture of these three
4 radionuclides.

5 DR. MAURO: Okay. So we have --
6 it's very different to convert those levels to
7 what --

8 DR. NETON: Yes. Those, those
9 numbers really couldn't be determined from
10 these measurements.

11 DR. MAURO: Got you. Okay.

12 DR. ULSH: I do, I do think,
13 though, that at least qualitatively, we can
14 say, if you combine the three different radon
15 isotopes and their daughters, the
16 concentration is high at the, at the hole
17 where they are leaking into the room, and the
18 cracks in the floor. And they're somewhat
19 less high near his desk. But I wouldn't go
20 much further than that at this point.

21 So to pick up, in July -- late
22 July of '79, they also sampled in the office

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1 that was next door. Now, to clarify, SW-19
2 was divided up into three separate office
3 spaces with partitions. Now, I don't know the
4 details about those partitions, in terms of
5 whether they were full wall or not. But there
6 were three different offices, and they sampled
7 in the office next to the one where the hole
8 was, and they measured 27.5 picocuries per
9 liter. And as we have just discussed, you
10 have to keep in mind the limitations of those
11 measurements at this point. So they are
12 somewhat less than what they measured in the
13 office with the hole.

14 And at this point, the health
15 physicists began to suspect that there were
16 other radon isotopes, and that their daughters
17 were contributing to what he was seeing.

18 So now we move to the next month,
19 in August of '79. And that hole in the floor
20 that they discovered was sealed, and it was
21 vented to an exhaust duct. And the sampling
22 that they took subsequent to this, and it's

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1 the same kind of sampling we've been talking
2 about, shows that it reduced the radon
3 concentrations near the employee's desk by
4 about a third.

5 Okay, so they're continuing on
6 now, and in September of '79, the tunnel that
7 they discovered, that underlied this office
8 space, was sampled through a hole that they
9 drilled in a manhole cover. And they detected
10 about 6,000 picocuries per liter. Now, that's
11 hot. And I've already described this tunnel
12 to you.

13 In October, so it's the next
14 month, an HP went in a bubble suit and mapped
15 that tunnel. And there were a couple of
16 sections of it, one of which underlies this
17 office space, and one which was right adjacent
18 to it. Later that month, they sampled in that
19 other section, and they measured 88,000
20 picocuries per liter. So these are extremely
21 high levels in this tunnel.

22 Early in 1980, so a couple of

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1 months later, they installed a ventilation
2 system to take air from the tunnel and vent it
3 out of the stack. And they sampled along a
4 base of the wall in the office area and that
5 indicated, quote, "it indicated a drastic
6 reduction in radon leaks."

7 Okay, that occurred in early 1980.

8 The exact date is not specified. Now, in
9 March 5th of 1980, they sampled again the
10 site, the employee's desk. And they measure
11 8.2 picocuries per liter. And this was with a
12 calibrated instrument, and so this is the
13 actual date that we proposed to end the SEC
14 period for radon.

15 Now, it's important for me to
16 point out here, that we are not saying that
17 radon concentrations went to zero. We are
18 simply saying that at this point, it stopped
19 being an unrecognized and uncharacterized
20 hazard, and it became something that they
21 recognized and remediated, and took measures
22 to address. But --

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1 DR. MAURO: Excuse me, Brant, this
2 is John again. That measurement that was
3 made, the eight picocuries per liter, was that
4 one of your short-term measurements, or was
5 that taken over a long period of time?

6 DR. ULSH: Let me check on that,
7 John. Hold on just a second. I think I can
8 come up with that pretty quickly.

9 DR. MAURO: And I bring it up only
10 because my experience is, radon concentrations
11 vary dramatically over time. And if it's, if
12 it's an integrated number, an average over an
13 extended period of time, you get a better
14 sense of the magnitude of the exposure that
15 workers in that environment might have
16 experienced.

17 DR. ULSH: Okay, that's a good
18 point, John. So let me tell you what we've
19 got here. From the HP's notes. On 3/5, that
20 sample is a grab sample, beside his desk. So
21 it is a short-term sample, and they measured
22 8.2 picocuries per liter. But over the same

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1 time period, this is March 3rd, 1980, through
2 March 11th, 1980, they put in -- let's see.
3 He says it's an RDT-310 PERM, and they are
4 calibrated to read that instrument, and the
5 result was 15.4 picocuries per liter. And he
6 says, "considering the difference in the two
7 sampling techniques, this compares well with
8 the 8.2 picocuries per liter value shown
9 above."

10 They then measured in the office
11 next door, and, let's see. That was from
12 March 14th up to April 18th, 1980, so the --
13 you know, the month following. And they
14 measured 7.7 to 13.4 picocuries per liter.
15 And that's pretty much the end of the story
16 from those notes. So they confirmed that the
17 remedial measures that they took had
18 drastically reduced the radon concentrations.

19 DR. MAURO: And let me just --
20 sorry, it's John again. Now, it would be fair
21 to say that the locations where those
22 measurements were taken are the locations

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1 where one would have expected, if there were
2 elevated levels above the old tunnels, this is
3 where you would expect to see them. Are there
4 any other locations -- buildings or rooms,
5 where there may have been some type of
6 connection that could have had a problem? Or
7 are these the ones where, I guess, based on
8 the layout, you would expect there to be a
9 problem, if there was a problem?

10 DR. ULSH: Well, I can only speak
11 for myself, John, and say that these are where
12 I would expect to find the problems. The
13 offices are right above the tunnel, and there
14 are cracks that communicate between the office
15 and the tunnel. So that's where I would
16 expect them to be.

17 Now of course, and this may be
18 something that the Working Group wants to
19 discuss, we can't prove a negative. I mean,
20 we can't prove that the radon didn't go
21 anywhere else in the building. However, keep
22 in mind how we've, currently, at least,

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1 defined the Class. I mean, my position is
2 that these exposures occurred -- if there was
3 a lung dose, and there obviously was a lung
4 dose that occurred in SW-19, and I cannot
5 estimate -- I can't put a reasonable upper
6 bound on that dose, for the guy who showed up
7 with the lung count, and to be honest, anyone
8 else who worked routinely in that room. I
9 can't estimate their lung dose either.

10 However, DOL has weighed in and
11 said that they can't really administer a Class
12 that's defined as one room. And on that
13 basis, we expanded the Class to be all of RW -
14 - R and SW building. So it's anyone who
15 worked in that building.

16 Now, I know that we're going to
17 want to talk some more about the exact Class
18 Definitions but I think that kind of, maybe
19 makes the point there, is the question that
20 you're asking a bit moot, because we've
21 expanded it to be the whole building.

22 DR. MAURO: Oh, I misunderstood.

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1 I thought, after a certain date, you were
2 claiming you can reconstruct the doses, but
3 prior to a date, you could not.

4 DR. ULSH: You are correct, John.

5 In terms of time, we're saying, prior to
6 March 5th, 1980, we cannot reconstruct a dose,
7 but after, we can. But for that time period
8 where we're saying we cannot reconstruct the
9 dose, that applies to all of R and SW
10 buildings.

11 DR. MAURO: And then after that,
12 you -- to say you can reconstruct a dose, is
13 based on these measurements that were taken,
14 where you saw somewhere between seven and
15 fifteen picocuries per liter.

16 DR. ULSH: Yes, that is correct.
17 That's where they observed the high radon
18 concentrations that communicate directly with
19 the radon source term. And so that's why we
20 put some stock in the measurements.

21 CHAIR BEACH: Brant -- this is
22 Josie. When you say "all of SW", you are

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1 talking SW-3, 17, 18, 19, so that includes all
2 --

3 DR. ULSH: Every -- every room in
4 R building, and in SW building. Every room.

5 CHAIR BEACH: Okay.

6 MEMBER ZIEMER: This is Ziemer.
7 Can I ask a question on that? Is -- Labor is
8 concerned that they cannot identify any
9 restrictions on access to the, sort of source
10 room, versus the rest of the building, or --

11 DR. ULSH: Well, let me give a
12 little more perspective to bring you up to
13 current -- the current situation, Paul. And
14 then I'll let Jeff Kotsch maybe speak for
15 Labor.

16 Currently, we have proposed,
17 anyone in R and SW, based on our earlier
18 conversations with Labor. However, this issue
19 is still not settled yet, because then the
20 question becomes, how do you identify the
21 population of workers who worked in R and SW
22 buildings?

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1 I originally came out with the
2 position that you can identify those workers
3 because these buildings were tritium
4 buildings, so they housed extensive tritium
5 operations, some of which the Working Group,
6 and SC&A and NIOSH have discussed extensively.

7 And so, we had heard from workers,
8 and we have documentation, that anyone who
9 went into this building, anyone who worked in
10 this building, had to leave a urine sample.
11 So I had proposed that that's a way that you
12 could identify who worked in this building.

13 Now, subsequent to my taking that
14 position, we had some interviews in
15 Cincinnati, and this was maybe, I don't know,
16 maybe a month ago. And one of the
17 interviewees -- and when I say "we," I'm
18 talking about, these were interviews conducted
19 by SC&A with some former workers, and we were
20 afforded the opportunity to participate. And
21 one of those interviewees said well, yes, you
22 were supposed to. I mean, it was clear

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1 policy, and it was clearly marked that you
2 were supposed to leave a tritium urine sample
3 if you came into the building, but it's
4 possible that someone could have come in, say,
5 for instance, to go to a meeting, or to visit,
6 you know, other areas of the building, and he
7 may not have left a urine sample. That's
8 plausible.

9 So, okay. That raises a question
10 now. But when we thought about it some more,
11 that's a little different, saying, if I just
12 went in for a meeting, I might not have left a
13 sample. But if I worked in this building for
14 250 days, I don't think it's plausible that
15 you could have not left a single urine sample.

16
17 And to test that, I talked to two
18 of the people that were, that were in those
19 interviews. And they both agreed with that
20 position. And to quote, one of them said -- I
21 asked if it would be plausible for you to work
22 250 days in these buildings, or visit 250

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1 days, and not leave a urine sample. And one
2 of them said that would be most unusual. I
3 would go so far as to say it could not happen.

4 The other one said -- the other person that I
5 talked to, said it's not possible. I don't
6 see how you couldn't have left a sample. If
7 you went in on an RWP, or if you worked
8 maintenance, you had to leave a sample. Even
9 if you went in only once, for five minutes.
10 But both of them did agree with the statement
11 that, you know, maybe if you went in for a
12 meeting, you wouldn't.

13 I then talked to a total of eight
14 people, and I have to say that these are
15 people who work on the NIOSH and ORAU Teams,
16 so they were easy for me to reach out and talk
17 to, and all of them said the same thing. So
18 we're getting a consistent story here, that it
19 would have been possible to go in, maybe for a
20 meeting or, you know, deliver a letter, or
21 whatever. But it's just not plausible for 250
22 days in these buildings, and you wouldn't have

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1 left a single tritium urine bioassay. So
2 that's why I'm confident in that position.

3 Now, we are still discussing this
4 with DOL, and they have some questions, and
5 you know, we are answering those questions.
6 But the Class Definition issue is not settled.

7 So, Jeff, I don't know if you want to add
8 anything further at this point.

9 MR. KOTSCH: Not other than --
10 excuse me. Not other than, yes, we are still
11 reviewing. I mean, our basic concern, I
12 think, is how -- you know, I guess the
13 availability of those tritium records to be
14 able to do that. We have talked to DOE
15 earlier, and we could not put people in those,
16 in the R or SW building, you know, through
17 employment records. So that's the reason we
18 talked further with NIOSH and said, you know,
19 we can't do it that way, but you know, is
20 there some other way.

21 But you know, I think the bottom -
22 - or one of the bottom lines for us is, you

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1 know, the availability and the completeness of
2 the tritium record. You know, the -- whether
3 we can figure whether they indeed left at
4 least one, you know, bioassay sample. But
5 anyway, the bottom -- you know, we're still,
6 we're still reviewing that issue.

7 DR. ULSH: So that's the long
8 answer to your question, Paul.

9 MEMBER ZIEMER: Yes, thanks.

10 DR. MAURO: And Brant, this is
11 John Mauro. I have a question now. The
12 interviews regarding the tritium sampling
13 practice, which was found very disciplined,
14 they were from people that worked there for a
15 certain time period. Now, the time period of
16 concern regarding the Class -- does it extend
17 decades before the time period these people
18 spoke about? Because I certainly would
19 understand why you would take a position,
20 listen, you know, based on the interview from
21 the people you spoke to, as applying to the
22 time period that they experienced it.

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1 Are we talking about, though, the
2 time periods that may go well before then,
3 also? Where perhaps that level of discipline
4 was not in place?

5 DR. ULSH: Okay. That's a good
6 question, John. To clarify, I told you I
7 spoke to a total of eight workers. Two of the
8 workers that I talked to were the ones that
9 SC&A interviewed in Cincinnati, about a month
10 ago. And those two workers were there from
11 before the Class Definitions till after the
12 Class Definitions. So they span the entire
13 Class Definition period. And those are the
14 two that I quoted to you directly here,
15 earlier.

16 The other ones that I talked to,
17 that worked on the NIOSH-ORAU Team, were there
18 after that. So, I mean, they were -- I mean,
19 they had some knowledge of historical practice
20 but they worked in a time period that was
21 after the radon Class.

22 DR. MAURO: Thank you.

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1 DR. ULSH: Sure.

2 MEMBER ZIEMER: This is Ziemer
3 again. Just a follow up question. Once a
4 person had access -- the so-called tritium
5 workers, to that facility, is it unrestricted
6 access to any part of that building?

7 DR. ULSH: That's a good question,
8 Paul. I don't know if access to all parts of
9 the building was granted once you were on
10 tritium bioassay -- I really don't know the
11 answer to that.

12 MEMBER ZIEMER: The reason I ask
13 that, of course, was that, you know, you sort
14 of start out with the room, which was -- or
15 the three rooms, or whatever it was, over the
16 tunnel. And the question kind of arises, is
17 that area itself restricted in any way, or is
18 it just an office, or offices, that anybody
19 could have wandered into once they were in the
20 building anyway.

21 DR. ULSH: Well, let me give you
22 what I know, and it's, it's incomplete. At

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1 least in later time periods, I'm talking about
2 after the Class, there was a differentiation
3 between SW building and part of R, because
4 that was a tritium facility, but then the
5 other part of R building was an alpha and
6 tritium. I think that's the way it went. But
7 that's after the time period, so I don't know
8 if that really applies.

9 I can tell you that, that the one
10 interviewee that told us that you could have
11 gone in for a meeting also did explicitly say
12 that you could have gone into SW-19, even,
13 just to, you know, deliver a letter or
14 whatever, I don't know if he said that part,
15 but you know, temporarily just go in --

16 MEMBER ZIEMER: Yes, but you're
17 not going to get 250 days out of that.

18 DR. ULSH: Right. But he did
19 specifically mention SW-19, so --

20 MEMBER ZIEMER: So it certainly
21 wasn't, it wasn't a restricted area in any
22 way. It was just an office.

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1 DR. ULSH: I don't think it was
2 restricted. I don't know. The weight of the
3 evidence suggests to me that it was not
4 restricted in terms of the time period that we
5 are considering --

6 MEMBER ZIEMER: Right.

7 DR. ULSH: From '59-'79, because
8 there were routine -- it was routinely
9 occupied as office space.

10 MEMBER ZIEMER: Right.

11 COURT REPORTER: Who asked that
12 question?

13 MEMBER ZIEMER: That was Paul
14 Ziemer.

15 COURT REPORTER: Okay. Thank you.

16 CHAIR BEACH: Brant, this is Josie
17 Beach. I have a question for you. You said
18 that after March 5th, 1980, you would be able
19 to reconstruct dose for individuals working in
20 those areas. Can you describe how you plan to
21 reconstruct dose?

22 DR. ULSH: Okay. Well, first of

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1 all, we're recognizing that this would only
2 apply to a few cancers. It would be lung and
3 respiratory tract cancers, I think, that we
4 would consider radon dose for.

5 CHAIR BEACH: Right.

6 DR. ULSH: But I think that what
7 we would do, is bound it based on the highest
8 of the measured concentrations after the
9 remediation occurred. So it would be
10 somewhere in the neighborhood of, I would
11 guess, I'm just looking here. Maybe 15.4
12 picocuries per liter. Don't hold me to that
13 exact number, but that's a ballpark estimate.

14 CHAIR BEACH: And that was taken
15 when?

16 DR. ULSH: The 15.4 was taken over
17 the time period of March 3rd, 1980, to March
18 11th, 1980.

19 CHAIR BEACH: Okay. So do you
20 have anything from 1980 to, say, I don't know,
21 into the `90s?

22 DR. ULSH: Well, I can tell you

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1 that the time period I've taken you up to so
2 far is from the health physicist's notes.
3 There were some follow-up documents that were
4 prepared, and these are memos that are also in
5 the SRDB. And it's from the same health
6 physicist, but to different people. There's
7 one dated in 1982, where apparently they, they
8 weren't satisfied with those levels that they
9 had measured. They were below the RCG, but
10 they, you know, for ALARA purposes, they
11 wanted to reduce them.

12 So in 1982, they went in and did
13 some further sealing, and measured for radon-
14 219 and 222. And what they found was that the
15 219 decay products is comparable to what would
16 be a guideline value for an uncontrolled area,
17 for example, in a residence. And, let's see.

18 Only trace quantities of radon-222 decay
19 products were observed. This is due to normal
20 background. And these were measurements that
21 were taken in March and April of 1982, and
22 this is in SW-19.

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1 And then sometime -- I can't tell
2 you exactly when, because I mean, we have this
3 detailed account up to 1980, and then the
4 people that I talked to here, former Mound
5 workers, said that in 1990, which was right
6 around when they were working there, that
7 area, SW-19, was no longer routinely occupied.

8 So they didn't have office space in there
9 anymore. They, they did say that people could
10 go in on a short-term, temporary basis to do
11 specific jobs, but not routinely occupied.
12 But I don't know when that happened, any more
13 definitely than some time between 1980 and
14 `90.

15 And then the next piece of
16 information that I have is a memo that's dated
17 April 3rd, 1990, and it says on March 27th,
18 1990, that health physicists made some
19 measurements in this room. It's a little
20 convoluted. It's an indirect method. And
21 they were looking for radon-219 and they
22 measured 0.2% and 0.1% of the DAC for radon-

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1 219. So this is about 0.7 picocuries per
2 liter.

3 So the answer -- the long answer
4 to your question, Josie, is that at periodic
5 times after 1980, we have confirmatory
6 sampling that shows low measurements. It was
7 also told to me anecdotally, that when people
8 went in after 1980, so around, you know, in
9 the 80s and 90s, when they did work in these
10 rooms, they did radon monitoring. But we
11 don't have that data. We haven't located it.

12 CHAIR BEACH: Okay.

13 DR. MAKHIJANI: Brant, this is
14 Arjun. Are there any measurements from other
15 rooms that you've come across?

16 DR. ULSH: The only -- well, the
17 measurements that I've seen from other rooms,
18 Arjun, are all relatively close by to SW-19.
19 They measured daughter products outside, you
20 know, right outside of SW-19. And they were
21 low. But I don't have measurements from other
22 rooms in the building.

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1 DR. MAKHIJANI: I found a
2 document, 1994 radon levels in SW-11. It
3 doesn't seem to be a complete document. I
4 found several documents that were pieces of
5 documents, actually, so it's a little bit
6 difficult to interpret. But, so far as I can
7 see, these were measurements in SW-11, in 1994
8 --

9 DR. ULSH: Okay.

10 DR. MAKHIJANI: -- that were more
11 than 700 picocuries per liter of radon. And
12 apparently they were vented. They were, they
13 were doing some venting at the time. I don't
14 have a diagram of the physical arrangement or
15 whether measurements were made. I can give
16 you the SRDB number.

17 DR. ULSH: Okay, yes. What is
18 that, Arjun?

19 DR. MAKHIJANI: 8691.

20 DR. ULSH: 8691 SRDB. Okay. I
21 will take a look at that. I am not familiar
22 with it. Let's see, you said SW-11?

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1 DR. MAKHIJANI: Yes.

2 DR. ULSH: Oh, I see SW-11. It is
3 right next door to SW-19.

4 DR. MAKHIJANI: Yes, so it might
5 have had some communication with this tunnel.

6 Apparently, these were -- I suspect these
7 were D&D type of, you know, measurements they
8 were doing, in connection with, with D&D
9 activities or planned D&D activities. So I'm
10 not sure of the configuration or the state of
11 decommissioning of the building.

12 But you can see right away, as
13 soon as you open it, the -- it says average
14 weighted concentration, 737.6 picocuries per
15 liter emitted from the building, you know.
16 Then they have a stack flow number of 2.5
17 curies, and so on, so there is some data
18 there. It is a little bit hard to figure out.

19 DR. ULSH: That gives me a little
20 bit more information. I was thinking -- as
21 you were describing that, I was thinking that
22 SW-11 is where the stack was when they pulled

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1 the air out of the tunnel and sent it up a
2 stack. So I think what you're looking at, now
3 I don't know, because I've got to go look at
4 this document, but I think what you're looking
5 at is measurements of the gas that was pulled
6 off of the tunnel and sent up the stack, and
7 that's measured in the stack. But again, I
8 have to look at that document to make sure.

9 DR. MAKHIJANI: Yes. As I say, I
10 did, I did not know, I could not interpret
11 from this document what it was.

12 DR. MAURO: And Brant, this is
13 John. I think that's a very important
14 question, if that was a measurement made in
15 the room, as opposed to a measurement made at
16 a stack. It changes everything.

17 DR. NETON: John, I would be
18 surprised if that's actually a room
19 measurement. This is Jim. But I might make
20 one, one observation here. One statement.
21 That, you know, this is an 83.14 petition,
22 initiated by NIOSH, to add a Class. It in no

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1 way precludes the extension of this radon
2 Class beyond the date prescribed, which I
3 think is 1980. All we're saying with this
4 Class Definition right now, is that we have
5 identified, at this point in time, a Class
6 that we would like to add, and get resolution
7 for these claimants as soon as possible. And
8 it would not, you know, bias any further
9 evaluation after the, you know, the Class
10 Definition ends.

11 DR. MAURO: Fair enough.

12 CHAIR BEACH: Jim, that's a good
13 point. Thank you, Brant. Are you, do you
14 still have more for your presentation?

15 DR. ULSH: Are you talking about
16 today?

17 CHAIR BEACH: Yes, this morning.

18 DR. ULSH: No. No, that's pretty
19 much all I have, Josie.

20 CHAIR BEACH: Okay. Any other
21 questions for Brant, before Joe comes in with
22 his questions and comments?

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1 MEMBER PRESLEY: This is Bob
2 Presley. I don't.

3 CHAIR BEACH: Okay, thanks.

4 MEMBER ZIEMER: I -- this is
5 Ziemer. I am okay on it.

6 CHAIR BEACH: Thank you. Phil,
7 Brad?

8 (No response.)

9 CHAIR BEACH: Joe, are you ready?

10 MR. FITZGERALD: I'm ready.

11 CHAIR BEACH: Okay.

12 MR. FITZGERALD: Good morning.

13 CHAIR BEACH: Good morning.

14 SC&A QUESTIONS AND REMAINING ISSUES

15 MR. FITZGERALD: We originally
16 raised the radon issue in the Site Profile
17 review back in 2006-7. And, at that time, we
18 had a number of issues, one of which was we
19 felt there was a, a radon issue for the R and
20 SW complex as a whole. No, no single room,
21 even though, admittedly, you know, we have
22 this series of measurements in SW-19. Based

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1 on our interviews of former rad techs that
2 were in R building, for example, you have a
3 circumstance, just backing up a little bit, in
4 terms of operations.

5 Imagine you have a, you know, a
6 radium cave with large quantities of radium,
7 thorium and actinium. It was a real -- a
8 hotbed. And the remedial action was
9 essentially to, you know, bulldoze over it, to
10 sort of landfill it in place, and then to put
11 a concrete cap over it, and then build the R
12 and SW complex on top of it, in the 60s. And
13 in the process, there was a tunnel that was
14 constructed, as Brant had mentioned.

15 But as far as having, you know,
16 sort of a worst case scenario, you have a
17 substantial radium, thorium and actinium
18 source term under this building. The tunnel
19 affords a convenient accumulation point, which
20 sort of gives you a perfect storm, where you
21 have a concentration of these gases under the
22 building. Now that tunnel, as we point out in

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1 the Site Profile, ran under several or more SW
2 rooms, including 19, 11, I think 3, and
3 abutted the foundation of R building.

4 So, you know, as far as a conduit,
5 what we expressed in the Site Profile at that
6 time was a concern that certainly there was a
7 chance of infiltration along that foundation
8 line. And with the amount of intrinsic
9 pressure involved with the radon, certainly
10 would be a substantial source.

11 And more so, and this is based on
12 our interviews with the rad techs, former rad
13 techs in R building. You know, you had,
14 because it was a tritium operation, obviously,
15 you had negative pressure in the R and SW
16 complex, a lot of fume hoods and what have
17 you. And what they told us is, you know,
18 when you -- during the operating day, when you
19 turned the fume hoods on, when the fume hoods
20 were operating, they literally would peg out
21 on their counters -- this is in R building,
22 not SW-19 -- over fissures and cracks in their

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1 foundations, they would peg out with their
2 counters.

3 And their concern, of course was
4 the, was the -- what was streaming through is
5 radon, and as we know now, probably actinon
6 and thoron as well. So what we expressed at
7 that time, and what we carried forward into
8 the SEC evaluation, was a concern that you had
9 a large source underlying the, underlying SW-
10 19 as a room, but certainly with the tunnel,
11 and the fact that it was essentially bulldozed
12 and capped, a source that would contribute to,
13 likely, multiple rooms in both SW and R. And
14 with the interviews, and not only the rad
15 techs, but a couple of HPs, it looked like
16 certainly there was a radon issue in that
17 building.

18 Now, historically, and we can pick
19 this up as well, management attributed a lot
20 of the elevated radon to an adjoining coal-
21 fired plant that wasn't too far away, so they
22 were -- you know, when radon came up as an

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1 issue in that building, they tended to
2 attribute it to environmental sources. But
3 clearly, there was this technically enhanced
4 natural source that was under the building.

5 Now, I want to go back to -- and
6 this gets to our issue. Certainly the reason
7 there was a flurry of measurements in 1980,
8 there was an individual that was sitting at a
9 desk in SW-19, who happened to be lung
10 counted, and they found a relatively
11 substantial alpha count in his lungs which
12 they were concerned about being plutonium.
13 And they could not figure out how somebody who
14 was sitting in an office in SW could in fact
15 be exposed to plutonium. And that, that led
16 to the, you know, the supposition that it must
17 be radon. And that's where the measurements
18 come from.

19 And you know, again, there was the
20 venting that Brant talked about, in terms of
21 the early part of '80 to alleviate the
22 situation because they were seeing a lot of

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1 that streaming through. But I want to make
2 the point that the step function of claiming
3 mitigation in 1980 -- there's two issues for
4 us. One is the fact that we believe the
5 evidence, weight of the evidence points to a
6 much broader concern, exposure pathway for
7 radon, actinon and thoron in the SW/R complex,
8 beyond SW-19. I think there's a number of
9 data points for that, a number of interviews
10 for that.

11 And also, this question of 1980
12 being the step function where you could rely
13 on that measurement in 1980 as being, in a
14 way, credible enough to base dose
15 reconstruction. I think we, again, have
16 concerns over that. And starting with the
17 individual, for example, that was lung tested
18 originally. They lung tested him again. They
19 did a lung count on him in the Fall of 1980,
20 about six months after mitigation.

21 And this is in the October 24th,
22 1980 memorandum, subject Elevated Radon Levels

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1 in SW-19. And they were certainly hoping to
2 go back and just demonstrate that after they
3 did all the venting and what have you, that
4 this individual sitting there, in fact, his
5 lung counts would go down.

6 Unfortunately, his lung counts
7 went up. And there's a paragraph or two in
8 that memorandum which speaks to, you know,
9 their concern about, you know, it says here.
10 Several questions still remain. If the radon
11 has been reduced by a factor of ten, why were
12 so-and-so's latest lung counts as high as or
13 higher than before? You know, what is the
14 significance of these lung counts? And they
15 went back and tried to figure out what was
16 going on, but what they were surmising was
17 that the air entering the room contained radon
18 at high concentrations, but with low
19 concentrations of decay products, because
20 there was little delay. In other words, the
21 equilibrium issue.

22 However, now there was not enough

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1 time for a daughter to build up to a
2 significant level, equilibrium with radon.
3 But now, the potential existed for decay
4 products to build up to very high levels. And
5 now it appears that the radon is more aged
6 when it enters the room, and the decay
7 products are approximately 30% equilibrium
8 with the radon.

9 My reason to raise this, and you
10 know, certainly we can go back to this, is
11 that yes, they did mitigate, they did put a
12 pipe in there. But certainly they were
13 questioning exactly what was going on in that
14 room. And with radon, I think you have a real
15 challenge, because I think you have both the
16 variability with the operations, meaning that
17 you have to be very careful when you take the
18 measurements. I mean, I think some of these
19 notes that Brant and I have looked at, it's
20 made very clear that if you take the
21 measurements during the operating day, you're
22 going to get a much different measurement than

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1 if you took it on the weekends, because you
2 have the fume hoods and negative pressure
3 drawing in the radon from below. So you are
4 going to have somewhat higher levels.

5 The other issue is just simply if
6 you take a PERM over a week versus a grab
7 sample, the -- certainly the sampling over a
8 week, this is John's issue. It's going to be
9 much, much more credible than a grab sample,
10 because again, the variability of the radon is
11 going to be substantial over time and it's
12 only averaged by taking it, perhaps, over a
13 week or two. And that's made clear by these
14 notes as well.

15 But in this particular case, I
16 didn't see any documentation that, frankly,
17 resolved the question. But the whole source
18 of the concern, which was this individual in
19 SW-19, was in the end not necessarily resolved
20 as of the fall that year, primarily because
21 they didn't see a whole lot of difference in
22 the decay products they were picking up in his

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1 lungs.

2 Another issue, and again, I'm just
3 going to walk through the same documentation
4 that I think we're all looking at, and I think
5 Brant referred to as well. There's a 1990
6 memorandum, which talked about going back and
7 doing additional measurements. Brant referred
8 to that, and the reason, and this is based on
9 the memorandum itself. The reason they were
10 going back, was they were seeing, quote,
11 radon-222 concentrations that had recently
12 been measured in the area that were an
13 appreciable fraction of the DAC.

14 So they were seeing elevated radon
15 levels in SW-19 that were of concern in 1990
16 because they have approached appreciable
17 fractions of the derived air concentration.
18 And they called this individual back, he's the
19 same one who did the '80 measurement, to take
20 additional measurements.

21 And so, and his measurements -- he
22 did some confirmatory measurements in

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1 different places -- were relatively low and
2 the memorandum goes on to say, this is 1990,
3 goes on to say they couldn't quite figure out
4 why the disparity. But then he makes the case
5 that you've got to be very careful where you
6 take your measurements because given the
7 variability of how the radon was flowing into
8 the room, if you chose one location over
9 another, you could get a much different
10 answer. That was sort of his bottom line.

11 And beyond that, you know. The
12 question of whether SW-19, in the measurements
13 taken there, and I say measurements with a
14 quotation, with an asterisk, because
15 essentially there was only one measurement
16 taken after the mitigation, and then they had
17 taken some later. But I think the ones that
18 were taken later tended to vary over time. We
19 have one data point in '82, one data point in
20 this 1990 memo that is mentioned.

21 You don't essentially have, I
22 don't believe, a credible number that you

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1 could base dose reconstruction on, because
2 it's a grab sample, you have the variability
3 that was demonstrated by all these
4 measurements, and I can't say that there's
5 enough substantial documentation that would
6 show that the measurement in SW-19 was
7 bounding of all the other locations where --
8 in SW and R, where you might, in fact, have
9 had a very similar crack.

10 You know, cracks in foundations
11 are extremely common. In fact, again, when we
12 interviewed these rad techs, they would
13 purposely put their counters over these cracks
14 in R building to see the radon. And, I don't
15 see how one can bound all of the complex on
16 this one location. Particularly after it's
17 shown that there's a variability even in that
18 one location.

19 So that's kind of where we're
20 coming from, that essentially there's enough
21 information that raises doubt about, one,
22 whether in fact the mitigation in SW-19 was

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1 effective, and whether those resulting
2 measurements are credible enough that you
3 could use those for dose reconstruction over
4 the next twenty years or so, and two, that
5 they would be bounding of other locations in
6 the R and SW area, given, certainly the
7 interview feedback we've gotten from, I think,
8 reliable witnesses. These are rad techs that
9 did measurements and monitoring throughout R
10 and SW, that we did during the Site Profile.

11 And that's, I think that would be
12 what I would put on the table at this point.

13 WORK GROUP QUESTIONS AND GENERAL DISCUSSION

14 CHAIR BEACH: This is Josie.
15 Just, Joe, from what, from what you've stated,
16 it appears that we have the same issue in the
17 later years, after the 80s, that we had in the
18 earlier years.

19 MR. FITZGERALD: Yes, I don't
20 think, you know, the fact that the, you know,
21 again, radon was not on their screen. It
22 wasn't something that the health physics staff

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1 was concerned about in R and SW. I mean, they
2 were concerned about plutonium, concerned
3 about tritium, but you know, again, radon was
4 considered not a big deal.

5 They brought someone from the
6 environmental group, in fact, to do the
7 sampling only after they had this high lung
8 count which they could not explain otherwise.

9 And that's when they discovered the source of
10 the exposure coming through the crack.

11 But to, again, to hang the dose
12 reconstruction on the one measurement, the
13 grab sample that was done after mitigation,
14 giving some of these variables and
15 uncertainties some doubt, I think is premature
16 and there's enough evidence that -- you talk
17 about weight of evidence. I think the weight
18 of evidence actually tilts the other way.
19 That in fact, the, that the source of radon,
20 actinon and thoron exposure was pretty
21 ubiquitous in R and SW and was substantial
22 enough that concerns were raised over time

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1 about how to deal with it.

2 And they were sealing cracks if
3 they found them, but I can't see how one can
4 conclude that, in fact, all the cracks and the
5 foundation sources, and what have you, were
6 identified and in fact mitigated sufficiently,
7 so --

8 CHAIR BEACH: Wasn't there, during
9 an interview, I believe it was the Draper
10 interview in March of '08, that stated that
11 they noted counts of 100,000 cpm in the
12 elevated alpha activity on the first floor?

13 MR. FITZGERALD: Well, yes. In
14 our interviews, we interviewed on the Site
15 Profile as well as on the SEC. We raised this
16 issue to just about all the health physics
17 staff. And, you know, certainly in that
18 interview, he noted, yes, you know. They had
19 some big issues on the -- he characterized it
20 as the first floor of SW building, where they
21 were seeing elevated radon fairly constantly.
22 He mentioned 100,000 cpm, but I'm not sure

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1 what that means. He didn't, certainly,
2 provide any additional information, but again,
3 radon was not an unknown question there. I
4 think the confusion at the time was, you know,
5 management attributing it to environmental
6 sources inversions, when in fact, I think it
7 was known by a smaller group of folks that
8 there was a technically enhanced source right
9 under the building.

10 CHAIR BEACH: Right, right. Thank
11 you.

12 DR. MAURO: Joe, this is John.
13 I'm thinking about this now. It sounds like
14 there's a boundary -- it's a boundary
15 question. Am I correct -- 1980 is the date
16 that NIOSH is proposing as being -- prior to
17 then, they cannot reconstruct the -- rate the
18 exposures to radon and thoron, etc, but post
19 1980, they feel, at least right now, they
20 think they can, notwithstanding some of the
21 concerns that we're raising now. But, as Jim
22 pointed out, the door is still open regarding

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1 post-1980, pending resolution of some of the
2 concerns that we're discussing right now.

3 But I'd like to go to the period
4 that, as I understand, NIOSH is prepared to
5 grant or recommend an SEC Class to, and what
6 I've heard, and please confirm it if I'm
7 saying this incorrectly, clarify, that all
8 workers, prior to 1980, that entered this
9 facility and were monitored for tritium,
10 represents the Class. The argument being that
11 prior to 1980, before any remedy was put in
12 for the radon problem, there clearly was the
13 potential for substantial exposure to radon
14 prior to the remedy.

15 And second, the people that had
16 the possibility of being exposed for 250 days
17 prior to that time period can be defined as
18 those people that had bioassay, had tritium
19 bioassay, because they would not have entered
20 that area at that time. And, did that, did
21 the way I just described that as being, in
22 essence, NIOSH is prepared, is leaning in that

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1 direction, to recommend that Class? As far as
2 post-1980, that's sort of still to be
3 discussed.

4 DR. ULSH: That's pretty close,
5 John. Just to clarify, you might have said
6 this, I'm not sure, but yes, we are saying
7 that -- right now, we're saying that the
8 exposures occurred in SW-19, but we can't say
9 exactly who was in there, so it's all of R and
10 SW, and that can be identified as people who
11 gave tritium bioassay.

12 Now, we grant that someone could
13 have gone in periodically, I mean, just, you
14 know, to attend a meeting or whatever, without
15 leaving a sample, even though that was in
16 contravention of the policy. However, we felt
17 that -- the story that we have heard is that
18 it's not plausible to be in those buildings
19 for 250 days without leaving a tritium
20 urinalysis sample.

21 DR. MAURO: Now the two were --

22 MR. FITZGERALD: Now wait a

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1 minute, John. I think what I'm saying,
2 though, is that we don't accept the premise,
3 even though I understand that with Labor, that
4 construct is the only way that Labor can
5 approach this, we don't accept the premise
6 that one can confine the exposure pathway to
7 SW-19 because the implication is, then, that
8 the upper bounding, if any dose reconstruction
9 would be considered after 1980, would be based
10 on a measurement after mitigation in SW-19,
11 when in fact, what we're saying is that that
12 happened to be one measurement, one location
13 amongst probably many that were seeing an
14 exposure pathway, an influx of radon, thoron
15 and actinon. And there's no way to know if in
16 fact that was the bounding concentration to
17 dose reconstruction.

18 DR. MAURO: But that's post-'80.
19 Is that right? See, I'm trying to separate
20 out--

21 COURT REPORTER: I'm sorry, who
22 was speaking?

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1 MR. FITZGERALD: That's Joe
2 Fitzgerald.

3 DR. MAURO: This is John Mauro.

4 COURT REPORTER: I see.

5 DR. MAURO: Okay. So, but what --
6 the statement you just made, Joe, was that
7 you have a number of concerns, post-
8 remediation or post-1980.

9 MR. FITZGERALD: Well, 1980 as a
10 date is simply the only date that a -- that
11 measurements were taken from between the early
12 days and between -- until later in the time
13 frame.

14 DR. NETON: Joe, that's not true.
15 I mean, there's also the fact that they
16 vented the tunnel right with the stack --

17 MR. FITZGERALD: Well, no. I'm
18 just saying that the reason we're -- you know,
19 1980 figures in this conversation is because,
20 you know, the measurements were taken and
21 mitigation was done --

22 DR. NETON: Right.

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1 MR. FITZGERALD: And all I'm
2 saying is that, you know, the measurements
3 that were taken need to include the fact that
4 the whole origin of this issue, the canary in
5 the mine, which is this individual, his lung
6 count did not change, in fact it went up. And
7 the other issue is the one grab sample that
8 was taken after mitigation I don't think can
9 be surmised as reflective of elsewhere --
10 other locations. It happens to be one data
11 point, but, you know, I think we're taking a
12 leap --

13 DR. NETON: Well, Joe. I think we
14 disagree on those facts, but I don't think
15 that that should preclude this Class from
16 moving forward as defined, because we can talk
17 about this other stuff at future meetings. I
18 mean, I take some exception with what you're
19 saying, but again, if we look at the Class as
20 defined right now, I think we've got it
21 bracketed. And I was a little confused about
22 your SW-19 issue. I mean, we are proposing

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1 that it's R and SW buildings. Everyone in
2 those buildings is in this Class.

3 MR. FITZGERALD: Yes. I don't
4 disagree, Jim. I'm just saying, though, that,
5 you know, with the explanation that it is by
6 virtue a construct that Labor can work with,
7 and I accept that, and I understand it, I just
8 don't want for future discussions to have as a
9 premise that there's any acceptance of the
10 data in SW-19 even though it's being used to
11 construct the pre-1980 SEC Class, to indicate
12 or suggest that there's some acceptance of
13 that information as indicative of dose
14 reconstructability beyond the 1980.

15 DR. NETON: It's certainly a
16 starting point.

17 DR. MAURO: I think that -- I
18 think this is good. I mean, what I'm getting
19 -- see, what I'm hearing is that it's probably
20 a good idea right now to say well, then let's
21 talk about pre-1980 and the way in which the
22 Class is defined. And let's agree that there

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1 are certainly post-1980 issues that we -- that
2 are very much at play here.

3 So, but let -- so what I'm
4 hearing, though, is that defining the Class
5 the way you did, let's just -- thinking 1980,
6 we are all in agreement that certainly there
7 should be a Class that goes up to 1980. Then
8 the only other question is, you know, how do
9 you implement that, who is to be included?

10 Now, what I understand is that the
11 people that will be included are all the
12 workers that worked there for 250 days that
13 had bioassay done -- all the workers that had
14 bioassay data. And now, my question is, are
15 there areas, rooms, buildings that, pre-1980
16 now, where people could have gone in and have
17 been there for 250 days or more, but not had
18 bioassay, not had tritium bioassay samples?

19 I mean, that's really the heart of
20 the matter. Because I think we are all in
21 agreement, fine. I mean, up to 1980,
22 certainly. Maybe longer, but certainly up to

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1 1980 there is no argument. So as time -- in
2 terms of time, that's the box we're in. And
3 the question is, how big is that box? Is
4 there a degree of comfort that the tritium
5 strategy, by way of defining who should be in
6 the Class, is one that is dependable, or is it
7 possible there are people that may belong in
8 that Class that, you know, that we are going
9 to miss because of the tritium approach to
10 defining the members of the Class?

11 Are there rooms, are there
12 buildings, were there activities going on in
13 rooms or buildings that, where -- that people
14 could have been there for more than 250 days
15 but did not get bioassay samples. And I think
16 that -- you know, if we sort of
17 compartmentalize and could come to some
18 agreement regarding that boundary, and not
19 worry too much about post-1980 right now,
20 because clearly we have significant issues
21 post-1980. Maybe it's not, you know, maybe --
22 you know, maybe we can hold that -- I'm making

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1 a suggestion now. Hold that aside, because we
2 certainly are going to have some issues there.

3 But can we somehow come to a place of
4 agreement regarding the pre-1980 Class?

5 DR. ULSH: All right. Let me
6 summarize the information that comes to bear
7 on exactly the question that you just asked.
8 We have, first of all, let me --

9 COURT REPORTER: Who is speaking
10 now?

11 DR. ULSH: This is Brant Ulsh.

12 COURT REPORTER: Thank you.

13 DR. ULSH: Let me start with what
14 the documented policy was. And this is from
15 MD-20209 Health Physics Precautions Manual, SW
16 and R buildings, tritium areas. It says,
17 urine samples must be submitted by everyone,
18 worker or visitor, who is involved in any
19 operation in the SW building. And that
20 applies to the R building. I have a similar
21 document for R building.

22 Now that's the policy. So the

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1 question then is, okay, how closely was the
2 policy followed? Well, let's look at what the
3 workers have told us. Starting with the
4 interview that was conducted in Cincinnati,
5 when the one interviewee told us that it was
6 clearly the policy, and it was clearly marked
7 and everyone knew it, that you were to leave a
8 urine sample, but if you went in for just a
9 short period, it's plausible that you may not
10 have.

11 Now, all three of the interviewees
12 that I talked to agreed with that statement.
13 They also said, however, though, that it is
14 not plausible that you could have been in that
15 building for 250 days and not left a single
16 tritium urine sample. And I read you the
17 quotes.

18 DR. MAURO: Right.

19 DR. ULSH: And I talked to eight
20 other -- I mean eight workers total, that all
21 supported exactly that position.

22 DR. MAURO: And what -- so the

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1 workers that were there pre-`80 --

2 DR. ULSH: Yes.

3 DR. MAURO: What were the years
4 they were there? I mean, what is the time
5 period we are talking about? 1980 back to
6 when?

7 DR. ULSH: Let's see. One of the
8 interviewees, I just recall off the top of my
9 head, started in the 50s. I don't know. Do
10 you recall -- I mean, it was in the 50s or 60s
11 at least. Do you recall, Joe, the three
12 people that we talked to on --

13 MR. FITZGERALD: That went back to
14 the 50s. These guys were there for quite a
15 while.

16 DR. MAURO: Okay. And the Class
17 starts when?

18 MR. FITZGERALD: `59.

19 DR. ULSH: `59.

20 DR. MAURO: Oh. So you're talking
21 about a Class that begins `69 and goes to `80-

22 DR. ULSH: No, no, no. `59 to

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1 `80.

2 DR. MAURO: Oh, `59. I'm sorry, I
3 didn't hear you. `59-`80. And what we have
4 is some interview information from workers
5 that says that practice that you just
6 described, the person that described it, at
7 least one or two people were there.

8 DR. ULSH: Three.

9 DR. MAURO: Three people were
10 there from 1959. I just want to get the facts
11 in my head right, so. So the level of
12 evidence that we have, besides -- in addition
13 to written policy -- by the way, that written
14 policy that you described, where that was what
15 they did, is -- that was written early. I
16 guess that was written, you know --

17 DR. ULSH: I think the copy I
18 have, I think is 1979, so it's right at the
19 end of the Class; however it is issue -- it's
20 a late issue, and there are like five previous
21 issues that we're trying to track down now.

22 DR. MAURO: Okay, so in theory, we

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1 have two levels of evidence. This is what I'm
2 trying -- see, I'm trying to get my hand on
3 the box, pre-1980 box. And how we make sure
4 we didn't miss anybody.

5 The evidence -- one is that there
6 is actually some written policy that's --
7 right now, you're saying you have the 1979 but
8 you might be able to find some other paper
9 that goes before that, that makes that
10 statement.

11 DR. ULSH: Well, it's the previous
12 issues of the same document.

13 MR. FITZGERALD: I guess I have a
14 question for Jeff Kotsch. This is Joe
15 Fitzgerald. In terms of constructing the
16 Class, certainly it's -- we're trying to
17 prove, a little bit prove the negative, you
18 know, were there any exceptions where
19 somebody, from a security reason, might have
20 had access to R and SW but may not have been a
21 tritium operator, or somebody that was
22 considered a rad worker, and did not leave a

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1 sample, and that would, you know, I think that
2 would be probably pretty difficult, given the
3 state of the records, to prove. Is there any
4 way to simply say, you know, those who got
5 tritium bioassays or someone that could
6 demonstrate, you know, 250 days or more, I
7 mean, sort of an or part to this thing,
8 meaning that there might be exceptional cases,
9 I don't know what they are and I haven't --
10 certainly haven't looked at the data from that
11 standpoint. But if they were in the building,
12 you know, in that history, and you're talking
13 thirty years.

14 Were there individuals who were in
15 the building, exposed to radon, but not
16 considered, you know, tritium workers per se.

17 Maybe they were in a office environment
18 somewhere in the corner of the building, or
19 something -- that might come forward and say
20 that, you know, yes I was in the building for
21 more than 250 days but I, you know, didn't --
22 wasn't on a routine tritium bioassay.

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1 MR. KOTSCH: Joe, this is Jeff
2 Kotsch, Labor. And that's, and that's kind of
3 what we wrestle with. I mean, to us, the --
4 if there's a criterion for tritium bioassay,
5 that's like, one of the -- it's like --
6 monitored, or should have been monitored, for
7 some other Classes, but anyway. It's, you
8 know, it's one of the indicators that puts
9 somebody in the Class.

10 And then we were, since we can't
11 really put people in those buildings we were I
12 think generally thinking that we would just
13 look for 250 days employment on-site, you
14 know, in tandem with, you know, the tritium,
15 or evidence of, you know, leaving a urine
16 sample.

17 MR. FITZGERALD: Yes, my sense is,
18 probably a tritium bioassay would be 98-99%,
19 maybe even more encompassing, but what bothers
20 me is there just might be, over that length of
21 time, you know, a small handful of people that
22 could have been in that building, you know.

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1 And may not have been known to the people that
2 Brant and I talked to. They might have been -
3 - who knows, secretaries, clerks, they might
4 have been thought of as not rad workers, per
5 se, but you know, occupied office space, or
6 something.

7 I just, you know, again, I think
8 you almost need to have that additional
9 criterion.

10 MR. KOTSCH: Well, this is Jeff
11 Kotsch again. That's an issue with, you know,
12 most sites, you know, where we go on our -- we
13 almost always go on a case by case basis and
14 look at the available evidence and try to, you
15 know, figure out whether the person could have
16 been in there or not.

17 MR. FITZGERALD: Okay.

18 DR. ULSH: Let me, let me tell you
19 again what the policy says. Urine samples
20 must be submitted by everyone, worker or
21 visitor, who is involved in any operation in
22 the SW building. Same with R building.

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1 CHAIR BEACH: Brant, well that's
2 true --

3 MR. FITZGERALD: Yes, but that,
4 again, I think the interviews, Brant, to me
5 suggested that if you had a security clearance
6 you could be there. Now, the only question
7 is, we don't think you could be there enough
8 days to matter, but I think that opens the
9 door somewhat.

10 MEMBER ZIEMER: This is --

11 CHAIR BEACH: And this is -- oh,
12 go ahead, Paul.

13 MEMBER ZIEMER: Paul Ziemer here.
14 I just wanted to comment on that. I think,
15 Joe, what you're suggesting is someone who in
16 fact, could have been there an extended period
17 of time, but somehow didn't get their urine
18 sample taken. Is that correct?

19 MR. FITZGERALD: Well, yes. And
20 I--

21 MEMBER ZIEMER: Well, how about,
22 how about a definition that said, it sort of

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1 like, was monitored or should have been? How
2 about provided tritium samples, or should
3 have? Because, clearly under the policy, they
4 should have if they were in there for extended
5 periods.

6 MR. FITZGERALD: Yes, I think that
7 would work.

8 DR. MAURO: Yes, see I -- this is
9 John. I like the idea that there is a vehicle
10 to leave the door open and not, you know, for
11 this possibility, you know. And what I'm
12 hearing, it sounds like that is the standard
13 practice for Labor. That they wouldn't just
14 automatically, just draw a line if it was --
15 oh, no tritium sample, nope, you're not in the
16 Class.

17 It's not that simple. There are
18 these other considerations. And that's all I
19 was really asking.

20 CHAIR BEACH: Jeff, this is Josie
21 Beach. How soon, I know that we're going to
22 present this at the next, at the Board meeting

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1 next week. Will you have a definition ready
2 for us by then, do you think?

3 MR. KOTSCH: I'm sorry, Josie, was
4 that for me?

5 CHAIR BEACH: Yes, Jeff. That was
6 for you.

7 MR. KOTSCH: I mean, NIOSH creates
8 the definition. We're just trying to, you
9 know, work with them as far as how we would
10 implement it.

11 CHAIR BEACH: Oh, okay. I
12 understand.

13 DR. ULSH: The status right now,
14 Josie, is we have a draft definition on the
15 table with Labor --

16 CHAIR BEACH: Right.

17 DR. ULSH: But Jeff and I, and,
18 you know, the rest of the people at NIOSH and
19 Labor are still figuring out whether that
20 definition is, is workable for DOL.

21 DR. NETON: The whole thing is, I
22 think we all agree it's R and SW building.

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1 It's how to administer that. That's really
2 the bottom line right now.

3 CHAIR BEACH: Right. Because I
4 agree that we should have some provisions for
5 the exceptional cases of workers that may have
6 been in R and SW for the 250 days, but without
7 bioassay. And I also believe that we should
8 leave post-March 5th open for further Work
9 Group discussions.

10 DR. NETON: Well, it's not
11 specifically dealt with in the ER. I mean,
12 it's sort of implied. There's nothing that
13 prevents that date from being extended later,
14 by virtue of granting this 83.14.

15 CHAIR BEACH: Right.

16 DR. NETON: I mean, we've done
17 this before where oftentimes we'll run up
18 across a situation where we clearly know we
19 can't reconstruct something, we'll do the
20 83.14, and if we see something else, we'll
21 just add to it. But this gives the, you know,
22 the claimants a, you know, efficient process,

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1 where we can get things going as soon as we
2 identify an issue. And I think --

3 MR. KATZ: Josie, Josie, Jim, this
4 is Ted Katz.

5 DR. NETON: Yes.

6 CHAIR BEACH: Hi, Ted.

7 MR. KATZ: Actually, all of these
8 83.14's do explicitly address what you're
9 concerned about, Josie, because they all
10 specifically state that a second Class can be
11 defined down the road based on the research.

12 DR. NETON: Okay, you're right.
13 Thanks for reminding me of that, Ted.

14 CHAIR BEACH: Thank you.

15 MR. KATZ: It's boilerplate that's
16 in all these 83.14's that leaves that door
17 open for further research beyond the
18 boundaries of the Class that's specified in
19 the 83.14.

20 MEMBER ZIEMER: Josie, this is
21 Ziemer again. I have a sort of a procedural
22 question. Is this, today's meeting,

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1 information only, or does the Work Group need
2 to make a recommendation on this suggested
3 Class for the full Board meeting?

4 CHAIR BEACH: Paul, I believe that
5 we need to make a recommendation for the Board
6 meeting. I do think that the sticking point
7 might be the Class Definition, at this time.
8 Since we don't have that --

9 MEMBER ZIEMER: Well, I think we
10 understand the intent of it, so if the wording
11 can be remained, or remain to be sort of
12 worked out for final resolution, I think we
13 can go ahead, in principle, it would seem to
14 me, to, to prepare a recommendation.

15 CHAIR BEACH: Right, and I do
16 agree with that. If the other Work Group
17 members agree as well.

18 (No response.)

19 CHAIR BEACH: So, with that
20 silence, are there any other questions?

21 (No response.)

22 CHAIR BEACH: Comments?

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1 DR. MAKHIJANI: This is Arjun.
2 Could I ask Jeff Kotsch one question?

3 CHAIR BEACH: Yes.

4 DR. MAKHIJANI: Jeff, or Brant.
5 Would it be -- if this monitored for tritium,
6 would it be during any time that there were
7 one tritium sample, that worker would be --

8 DR. ULSH: Any time between 1959
9 and 1979, one tritium urinalysis.

10 DR. MAKHIJANI: Okay, great.
11 Thanks.

12 CHAIR BEACH: So Brad, or Phil,
13 are you both still with us?

14 MEMBER SCHOFIELD: Yes, I'm still
15 on the line.

16 CHAIR BEACH: Any comments or --

17 MEMBER SCHOFIELD: No, if we could
18 reopen it --

19 COURT REPORTER: Is that Brad, or
20 Phil?

21 MEMBER SCHOFIELD: This is Phil.
22 And I'm kind of inclined, let's go for this,

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1 because we know up to that date, there's just
2 no way they can do a dose reconstruction.

3 CHAIR BEACH: And Brad, are you
4 still with us?

5 (No response.)

6 CHAIR BEACH: Okay. I knew we'd
7 probably lose Brad. So, Paul and -- you're in
8 agreement, also, with this?

9 MEMBER ZIEMER: Yes.

10 CHAIR BEACH: Okay. So is there
11 anything formal, Ted, that we need to do to
12 make our recommendation, or --

13 MEMBER ZIEMER: And I think part
14 of this is basically we understand that both
15 NIOSH and SC&A are in agreement on those early
16 years, that there's not agreement after that,
17 and that's what leaves the door open on the,
18 on the post-`80 years. To talk to Joe's
19 point, I don't think taking this action
20 suggests that -- we basically haven't come to
21 any closure on the later years by doing this.
22 So that door is still open.

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1 CHAIR BEACH: And I would hope
2 that we would see the wording of the Class
3 Definition prior to Wednesday morning, next
4 week.

5 DR. ULSH: I would hope so too,
6 Josie, we'll do our best.

7 MR. KATZ: So is Bob Presley still
8 on the line?

9 (No response.)

10 CHAIR BEACH: I didn't think he
11 was. He said he only had an hour.

12 MR. KATZ: That's okay. I mean,
13 that's still three of you, which is a majority
14 of the Group, that concur. Which is good for
15 a recommendation.

16 CHAIR BEACH: Okay. And Ted, do
17 we need to do anything formal, or are we, we
18 okay with -- that we all -- that three of us
19 concur with --

20 MR. KATZ: I think that's fine,
21 what you said on the record. You all
22 concurred there should be a Class up to 1980

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1 and that the definition is not completely
2 resolved for administrative reasons. But your
3 intent is clear.

4 CHAIR BEACH: Okay. Then I would
5 conclude that we're finished with our
6 business, unless somebody or anybody has
7 anything else.

8 DR. ULSH: Well, actually, I do
9 want to state that, I mean, Joe got to give
10 his, you know, his impressions of the
11 different documentation, and I never got a
12 chance to respond to that --

13 CHAIR BEACH: Oh, okay.

14 DR. ULSH: And there are
15 definitely some points in there that I need to
16 elaborate on, but we can do that later, if
17 that's what you want to do. It's beyond the
18 '80 period.

19 MR. FITZGERALD: Yes, I, again, I
20 do think we have some more discussion, now
21 that we've kind of bifurcated this thing, and
22 I would look forward to just having that in

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1 the Work Group.

2 MEMBER ZIEMER: I did have one
3 additional question, and I think I know the
4 answer to it, but I'll go ahead and ask it
5 anyway, because this is in the time period,
6 actually, after the Watras event in
7 Pennsylvania, where high activity was found in
8 a worker, and it turned out the home was
9 contributing, not only contributing, was the
10 main source.

11 In this case, we have an
12 identified source in the work facility, but
13 was there ever any follow-up in the person's
14 home to determine whether or not there was any
15 contribution? I know that through parts of
16 Ohio and certainly Indiana, as well as
17 Pennsylvania, there are these high radon
18 areas, as well.

19 DR. ULSH: I'm not aware of
20 anything like that, Paul. I can't say that
21 there wasn't, but I don't have any --

22 MEMBER ZIEMER: I assumed that

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1 there wasn't or it would have been in the
2 record. But I thought I would at least ask,
3 because particularly with Joe's statement that
4 although we have just grab samples after 1980
5 --

6 DR. ULSH: That's not accurate, by
7 the way.

8 MEMBER ZIEMER: Pardon me?

9 DR. ULSH: That's not accurate, by
10 the way.

11 MEMBER ZIEMER: Oh, well. Okay.
12 Grab samples and the E-PERMS and so on. But
13 there's a lot of difference between many
14 hundreds of picocuries per liter and samples
15 which are running in the eight picocuries. I
16 mean, you do get variations, but usually not
17 two orders of magnitude over time and season.
18 But in any event, the implication -- it
19 appears that they were very close to ambient
20 on the samples post-'80, which then does raise
21 that question, why are the lung values still
22 up, where is that coming from? So I wondered

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1 what other follow-up had been done, or any
2 later lung -- do we just have that one set of
3 lung samples, or were there any later, like in
4 subsequent years?

5 DR. ULSH: I can speak to that a
6 little bit, Paul. This is from the memo that
7 Joe quoted from, dated October 24th, 1980.
8 There is additional text, and here's what it
9 says, let me just read it.

10 Since our lung counter is not
11 calibrated for radon decay products, it is
12 difficult to judge the significance of this
13 employee's lung count. We do know, however,
14 that Argonne and Los Alamos -- at Argonne and
15 Los Alamos, persons have been counted in
16 similar lung counters and have shown elevated
17 counts due to high radon levels naturally
18 occurring in their homes. It is my opinion
19 that the radon decay production concentration
20 in SW-19 could account for the elevated lung
21 counts and the erratic nature of the lung
22 counts. In other words, it is my opinion that

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1 someone breathing air containing a
2 concentration of radon decay products at or
3 near the non-occupational MPC of 1/30th of a
4 working level, could produce a lung count
5 which is elevated above the normal or baseline
6 count.

7 DR. NETON: Right, and -- this is
8 Jim Neton. I can certainly attest to that.
9 I've whole body counted hundreds, if not
10 thousands of people in my career, and it was
11 not unusual to have people show up with
12 elevated lung counts that received fairly low-
13 level exposures in their homes. And it's not
14 just really inhalation in the air, there is
15 radon in a lot of well water. And during my
16 research for my dissertation, I ran across a
17 number of people that were elevated in the
18 morning because they had just showered with
19 radon-containing water. So it doesn't take
20 much to have an increased lung count for radon
21 exposure. It's not a very good indicator of
22 the magnitude of the exposure.

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1 MEMBER ZIEMER: Well I suppose
2 this discussion is for another day, but at
3 least somebody has been giving some thought to
4 those, that part of it, as well.

5 DR. MAURO: This is John. Just
6 one quick question. When you say taking a
7 lung count, are you looking at that bismuth-
8 214 photopeak?

9 DR. NETON: No, that, see that --
10 John, this was a phoswich detector, and if I
11 remember the old Mound phoswich detectors,
12 they just did a ratio of two regions. I mean,
13 you couldn't even really --

14 DR. MAURO: Oh, okay. Got it.

15 DR. NETON: You weren't even
16 looking at peaks, necessarily.

17 DR. MAURO: Okay. Okay.

18 MR. KATZ: Okay.

19 CHAIR BEACH: So, this is Josie
20 Beach again. I would say that that concludes
21 our meeting for today, and we will schedule
22 another Work Group meeting in the near future.

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1 And Brant, will you be sending that via
2 email, or --

3 DR. ULSH: Are you talking about
4 the finalized Class Definitions?

5 CHAIR BEACH: Yes.

6 DR. ULSH: Yes, as soon as we get
7 some agreement with Labor and -- between us
8 and Labor, I will definitely fire it off to
9 the Working Group as soon as --

10 DR. NETON: Well it should go to
11 the whole Board, actually, at that point.

12 CHAIR BEACH: Yes.

13 DR. ULSH: Okay, all right, then
14 that's what I'll do.

15 CHAIR BEACH: Okay.

16 Thank you very much.

17 MEMBER ZIEMER: Thank you.

18 (Whereupon, the above-entitled
19 matter went off the record at 11:26 a.m.)
20
21
22

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