

NATIONAL INSTITUTE FOR OCCUPATIONAL
SAFETY AND HEALTH

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OFFICE OF COMPENSATION ANALYSIS AND SUPPORT

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ADVISORY BOARD WORKGROUP ON BLOCKSON
CHEMICAL SPECIAL EXPOSURE COHORT (SEC)
PETITION

+ + + + +

WEDNESDAY,
OCTOBER 15, 2008

+ + + + +

The Advisory Board Workgroup
convened in the Frankfort Room of the
Cincinnati Airport Marriott at 9:30 a.m.,
Wanda Munn, Working Group Chair, presiding.
MEMBERS PRESENT:

- WANDA MUNN, Chair
- BRADLEY CLAWSON
- JAMES MELIUS
- GENEVIEVE ROESSLER

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IDENTIFIED PARTICIPANTS:

NANCY ADAMS, NIOSH Contractor
BOB ANIGSTEIN, SC&A
HARRY CHMELYNSKI, SC&A
LARRY ELLIOTT, NIOSH
LIZ HOMOKI-TITUS, HHS
EMILY HOWELL, HHS
TED KATZ, Designated Federal Official
JIM NETON, NIOSH
CHICK PHILLIPS, SC&A
KATHY PINCHETTI, Petitioner
HAROLD RINGER, Public
JERRY RINGER, Public
WILLIAM THURBER, SC&A
TOM TOMES, NIOSH

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

2 (9:37 a.m.)

3 MR. KATZ: This is Ted Katz, and
4 I'm the DFO for the Advisory Board on
5 Radiation and Worker Health, and this is the
6 Blockson Chemical Workgroup. And sorry we're
7 a little bit delayed. We had some technical
8 difficulties. They may crop up again, but
9 we're going to try to go forward.

10 So first off, we're just going to
11 do roll here. We'll start with board members
12 in the room identifying themselves, please.

13 CHAIR MUNN: This is Wanda Munn.
14 I'm Chair of this working group.

15 MR. CLAWSON: Brad Clawson, working
16 group member.

17 DR. MELIUS: Jim Melius, working
18 group member.

19 DR. ROESSLER: Gen Roessler,
20 working group member.

21 MR. KATZ: And on the phone, Mike
22 Gibson, are you with us? Okay. Well, Mike

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1 did inform me that he probably wouldn't be
2 able to attend. Just checking. Then now
3 starting with NIOSH ORAU team, if you'd
4 identify yourself and also address conflict of
5 interest, please.

6 MR. ELLIOTT: Larry Elliott,
7 Director of the Office of Compensation
8 Analysis and Support at NIOSH. I have no
9 conflict regarding Blockson.

10 MR. NETON: Jim Neton, NIOSH Office
11 of Compensation Analysis and Support. No
12 conflict.

13 MR. TOMES: Tom Tomes, NIOSH Office
14 of Compensation Analysis and Support. I have
15 no conflict.

16 MR. KATZ: And on the telephone,
17 please?

18 DR. CHMELYNSKI: Harry Chmelynski,
19 SC&A, contractor support. No conflict.

20 MR. KATZ: NIOSH on the telephone?
21 Okay. Then in the room, SC&A?

22 DR. ANIGSTEIN: Bob Anigstein, no

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1 conflict.

2 MR. KATZ: And on the phone, do we
3 have another SC&A?

4 MR. THURBER: Bill Thurber, no
5 conflict.

6 MR. PHILLIPS: Chick Phillips, no
7 conflict.

8 MR. KATZ: And I think that's all
9 that we're expecting today. Now, going on to
10 members of Congress or their representatives.

11 Are there any on the phone with us today?
12 Okay. And then how about worker
13 representatives or petitioners from Blockson?

14 Okay. Other federal employees in the room?

15 MS. HOWELL: Emily Howell, HHS, no
16 conflict.

17 MS. ADAMS: Nancy Adams, contractor
18 with NIOSH.

19 MR. KATZ: And on the telephone?

20 MS. HOMOKI-TITUS: This is Liz
21 Homoki-Titus with HHS.

22 MR. KATZ: No conflict, right? And

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1 then any other members of the public? Okay.
2 Just a last note then for those of you on by
3 telephone, please use star 6 or mute, except
4 when you're addressing us. And if you
5 disconnect, please fully disconnect. Don't
6 put us on hold. It interferes with the call.

7 Thank you. Wanda?

8 CHAIR MUNN: Thank you, Ted. I
9 believe everyone has received a copy of my e-
10 mail sent on the 12th, which gives a very
11 loose draft. We anticipate approaching our
12 problems and questions before us today. If
13 anyone has anything to add to that agenda, we
14 can do that at any time, this being the first
15 opportunity. If you have something you feel
16 that we need to cover that is not indicated on
17 that brief agenda, please let me know.

18 Otherwise, we will begin by
19 following the instructions that were given to
20 us by the Board at our last meeting in Redondo
21 Beach, when we presented activities to this
22 date and made a split recommendation. At that

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1 time, the Board asked us to do several things.

2 The first one was to focus on the
3 radon issue. That's our first item that we
4 have listed here. We've had several documents
5 since that time exchanged by e-mail. We were
6 anticipating John Mauro to be here today to
7 lead this discussion. John has had to be
8 called away on a family emergency, and Bob
9 Anigstein has agreed to step in and do that
10 presentation for us. We appreciate you being
11 here, Bob, and we'll leave you to lead off
12 with our overview on the facts relative to the
13 radon issues at Blockson Chemical.

14 DR. ANIGSTEIN: First, I'd like to
15 start off with completing my own thinking on
16 this problem, as I got into it, and so I think
17 the first order would be a quick primer on
18 radon. I know many of you here are probably
19 very familiar with it, but bear with me.
20 Radon-222 is generated when radium-226 decays.
21 When radium-226 decays in a mineral matrix,
22 in any case but I'm focusing on mineral

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1 matrix, what you have is a very energetic
2 alpha particle coming off with something in
3 the order of 4 or 5 MeV. The alpha particle
4 has an atomic mass of four. Then what is left
5 behind is the radon-222, which has a mass of
6 222. So you have a mass ratio now of about 1
7 to 50 between this past projectile and this
8 heavy one, it goes in the opposite, and the
9 effect is very similar to if you fire a heavy-
10 caliber pistol. The fast-moving bullet comes
11 out, the gun kicks back, the recoil. Because
12 there is Newton's law, the momentum starts off
13 at zero and has to end up at zero, so the
14 momentum of the particles are equal.

15 So the radon-222 travels right
16 through the rock matrix, given enough of an
17 impetus, typically 20 to 70 nanometers, which
18 would be roughly 120th of the micron. So
19 that's many, many, many atomic diameters. But
20 it is still a very short distance compared to
21 the structure of the rock. Now, this is
22 called rock. That's a trade term, but it may

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1 actually be confusing because we're talking
2 about particles or about .85 millimeters or
3 850 microns.

4 When they mine the rock in Florida,
5 it goes for a process called beneficiation.
6 So they prepare it, so before they ship it
7 they separate it out or they take out the big
8 pebbles and they use them in road
9 construction, and they take out the very fine
10 dust. And what's left is what goes through a
11 sieve, and that's the .85, it's actually
12 less than, because that's the maximum that
13 will go through that sieve. But it's on that
14 order of magnitude, probably not much smaller.

15 So that is much, much bigger than
16 the range of recoil of the radon. The
17 question is, well, how does radon ever get
18 out? Because even these little grains are not
19 really solid. They have what is called
20 nanopores in them. Nanopores because they're
21 on that order of magnitude of nanometers. And
22 so the radon recoil may shoot it out of the

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1 solid matrix into one of those nanopores. It
2 may also shoot it, if it's dry, nanopores are
3 filled with air, will shoot it right through
4 the nanopore into the opposite side and,
5 again, embed itself in the matrix.

6 However, if it's wet, the water
7 tends to stop it. So, interestingly enough,
8 you have, and this was measured more
9 specifically for Florida phosphate ore, you
10 have an emanation coefficient of about 11
11 percent for dry, the dry ore, and roughly 30
12 percent if it's wet.

13 So the ore comes shipped by a
14 freight car or a barge up to Blockson, and it
15 got unloaded in silos. And according to an
16 EPA report on phosphate mining, phosphate
17 processing, they keep it wet. It's typically
18 ten percent moisture. So the pores are, pores
19 in aggregate material, like in soil, typically
20 are about 35 percent of the volume. So ten
21 percent moisture means that the pores are
22 partially filled but not completely filled

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1 with water. So you will have an emanation
2 coefficient that's somewhere between 11
3 percent and 30 percent while it's sitting in
4 the silo.

5 The next step is the calciner. And
6 it goes from the silos to the calciner oven,
7 which is outdoors, and it gets heated to 1400
8 to 1600 degrees Fahrenheit. At that
9 temperature, actually the water mobilizes, and
10 even if there's air there, the steam, you have
11 like a steam cleaner. The steam will just dry
12 the air out and any radon that's accumulated
13 in either the water or the air in the pore
14 spaces will be driven out.

15 So now you are left with the ore
16 that has no radon, no free radon. It still
17 has radon in the matrix in those fine grain --
18 because, again, it's not a solid. Even the
19 850 microns is not a solid piece. And under a
20 microscope, it's composed of little grains,
21 which are welded together. I'm not a
22 mineralogist, that's just my understanding.

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1 And Bill Thurber is on the line, so, Bill,
2 feel free to correct me if I'm grossly wrong
3 on anything.

4 MR. THURBER: Charge on.

5 DR. ANIGSTEIN: Okay. Bill Thurber
6 is the person we turn to in the company for
7 expertise or research on industrial processes.

8 Once it's been dried in the calciner, we have
9 up to 70 percent of the radon that may have
10 accumulated over time is left in. It could be
11 less maybe because there may be some, that 30
12 percent emanation, that's what gets out. Some
13 may still stay in the nanopores, but that was
14 measured in equilibrium. So that's an upper
15 limit and highly unlikely to be more than 70
16 percent.

17 The dry ore then goes in through a
18 screw conveyor, so it's a continuous process.

19 As it gets baked, it goes into Building 40.
20 And the dry ore now has an emanation
21 coefficient of about 11.

22 Then the first thing that it will

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1 come through is the grinder. So in the
2 grinder, it gets ground down about tenfold.
3 And, again, it has to pass through a sieve,
4 and now we're talking about 74 microns. It's
5 still much less than the recoil distance.
6 It's still three orders of magnitude larger
7 than the recoil distance. So the emanation
8 from this ground powder may be a little less.

9 I don't have specific numbers on the
10 difference between the bigger particles and
11 the smaller particles, but it should not be
12 substantially less.

13 And then it resides, and this is an
14 estimate that it resides in building for about
15 four hours. And at the end of the grinding
16 process, it gets, by conveyor, up to the
17 second floor, and it gets dumped into the
18 sulfuric acid. This is approximately 30
19 percent sulfuric acid. First of all, they
20 had, according to one of the workers that we
21 interviewed, the sulfuric acid comes in at a
22 higher concentration, gets mixed with water.

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1 When you mix sulfuric acid with water, it's a
2 high isotonic reaction.

3 So now you have the ore being
4 dissolved in the hot acid. The radium, the
5 process, there is the ore, I believe it's
6 calcium phosphate with other things in it.
7 This gets dissolved, and then the calcium
8 sulfate precipitates out as radium sulfate.
9 And so you are left with the phosphoric acid,
10 so out of sulfuric acid you get phosphoric
11 acid.

12 The radon is now liberated. The
13 rock is completely dissolved. Potentially,
14 all the radon that was now stored in the
15 matrix and couldn't get out because it was not
16 in a nanopore can be liberated into the acid.

17 And then the big question is -- the sources
18 of radon in the building are, first, these
19 four hours that the ore has in the building
20 and it's building up radon. But since it has
21 been freed, any free radon goes in. The
22 build-up is on the order of one percent or two

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1 percent, three or four percent, of the
2 equilibrium. But then with an emanation
3 coefficient of 11 percent, you have 11 percent
4 of this 4 percent getting out. It's more like
5 3 percent. So you have a fraction, a third of
6 a percent, of the equilibrium amount of radon
7 that could potentially come out if the radium
8 were just sitting there as a powder, say, is
9 liberated during those four hours. So it's a
10 very small amount.

11 CHAIR MUNN: Someone is trying to
12 say something.

13 DR. ANIGSTEIN: However, once all
14 of the remaining radium and radon is dissolved
15 in the sulfuric acid, potentially all of it or
16 none. There's no literature that I could find
17 on the solubility of radon in hot sulfuric
18 acid. We know that radon is somewhat soluble
19 in water, and, again, even if it was cold
20 water, under equilibrium conditions, or warm
21 water, under equilibrium conditions, most of
22 it would be in the room because what you would

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1 have is the partition between the radon in the
2 air and the radon in the water. And it favors
3 the air on a picocurie per liter basis. So
4 for every picocurie per liter, I'm just
5 reporting numbers from the top of my head, but
6 for every picocurie per liter of radon in the
7 water you will have about two picocuries per
8 liter in the air. But that's equilibrium.
9 Now, you don't get how long it takes with
10 something else. Here, you probably don't have
11 equilibrium. Here, it's a continuous process.

12 So the first thing I did was a
13 Monte Carlo analysis. So this is the model.
14 I won't try to go through it in any detail but
15 just to give you -- I won't explain every
16 term, but this is, basically, this is the rate
17 of the ore comes in, the specific activity of
18 the ore. The specific activity, we based it
19 on rock in central Florida that was published
20 activity. That was the more conservative
21 assumption. Northern Florida has much lower
22 radium, so we took a central Florida rock, and

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1 we don't know where the Blockson ore came
2 from, whether it came from northern Florida or
3 central Florida.

4 And this term is simply the amount
5 that's liberated in the air prior to going
6 into the acid. The fraction there is about
7 one-third.

8 And now here is the most important
9 and least known factor: the fraction of radon
10 and sulfuric acid. And in our model, we just
11 say it could be zero to one. This is the most
12 important term. And on the denominator, we
13 have the volume of the building that I'll get
14 to in a moment; the air exchange rate; and the
15 decay of the radium.

16 Now, the air exchange rate is much
17 faster than decay of the radon, so the lambda
18 does not have a strong -- But it would always
19 go to zero. So we did two things. First, we
20 did a Monte Carlo analysis where every one of
21 these terms was given a range except, of
22 course, the decay rate of radon is very well

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1 known and the processing rate of the ore is
2 given in the TBD and it was based on
3 literature, so we treated that as a fixed
4 number. We didn't have a range for that.
5 Everything else there was a range, which the
6 radium is based on measurement, and we have a
7 published value of the mean and the standard
8 deviation and normal distribution. The time
9 of residence of phosphate rock, that's an
10 industrial estimate by Bill Thurber, and so we
11 just said four hours is the best guess. It
12 could be from two to six hours triangular
13 distribution. And then the emanation
14 coefficient wasn't dry. Again, based on
15 measurements, there is a range of distribution
16 for each one of those.

17 But then we tested the model by
18 determining, as you can see, the two most
19 important factors are the air exchange rate
20 and the release fraction from the acid. So we
21 took the median or mean value of each of the
22 other parameters that could vary and just

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1 focused on these two and did a range of
2 numbers. These are deterministic of five by
3 six, so you have 30 values there, and they go
4 all the way with a zero release fraction from
5 the acid, which is the only source of radon is
6 from the ore, as four hours approximately that
7 it sits in the building and the highest air
8 exchange rate, which was 5.5, which you could
9 have in the summer if, for a while,
10 everything was overloaded.

11 Again, we have no knowledge of the
12 air exchange rate there. We don't even have a
13 consistent information of the way the building
14 was ventilated. We interviewed three workers,
15 and we got three different opinions.

16 So we just went by published literature,
17 measurements of industrial building, and it
18 could go as high as 5.5. It could go as low,
19 the lowest range here, 0.5, just for
20 convenience, making the table. Actually, it
21 can go as low, we used 0.1 in the analysis at
22 the lower end of the range, given a uniform

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1 distribution, which is probably, again,
2 unlikely on the low side.

3 And so we get a huge range. We go
4 from 0.04 picocuries per liter to 91
5 picocuries per liter, assuming the lowest of
6 the air exchange rate and the highest release
7 fraction. Everything that gets dissolved in
8 the acid comes out.

9 Then we did, using this Crystal
10 Ball, which is an add-on to Excel, we did the
11 Monte Carlo analysis ran quickly, so did
12 100,000 events, randomly selecting each of the
13 parameters. And you see the peak here is at
14 the very low value, the curve comes up to 3.2.

15 This is just how Crystal Ball works. How it
16 chooses these ordinate values, I don't know.

17 So we have a mode here at a very
18 low value. Then it goes up to a higher value.

19 And then here's the distribution. So the
20 median, which is higher than the mode, is 7.7
21 picocuries per liter. In 95th percentile,
22 it's 62.

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1 So if we want to be very
2 conservative, highly claimant favorable, and
3 say, well, if we assign the 95th percentile,
4 it's highly, highly unlikely that you'll get
5 higher than that. But even that, even this
6 distribution has some conservative
7 assumptions, like all the rock came from
8 central Florida. So that basically sums up
9 the model.

10 CHAIR MUNN: Thank you very much,
11 Bob. Does anyone have any questions of Bob?

12 DR. MELIUS: Yes. That's the model
13 you put in Appendix B?

14 DR. ANIGSTEIN: Yes.

15 DR. MELIUS: Okay. So that's not
16 changed since then?

17 DR. ANIGSTEIN: No, definitely not.

18 As exactly we detailed in Appendix B, the
19 report also briefly refers to a preliminary
20 investigation that we had done actually prior
21 to the last workgroup meeting, which was a
22 scoping calculation with, I would say, non-

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1 mechanistic. We didn't really go into the
2 details at that time.

3 CHAIR MUNN: Thank you, that's
4 helpful. Any other
5 questions?

6 MS. PINCHETTI: I had one question.
7 This is Kathy Pinchetti from California. Why
8 would it be highly unlikely to attribute more
9 than 95 percent? Because there's quite a jump
10 in the value between 61.95 and 651.

11 DR. ANIGSTEIN: That would be, that
12 one is the extreme upper end, which out of
13 100,000 trials you get that once, that number.

14 So when I say highly unlikely, it's because
15 95 percent seems to be sort of considered to
16 be a very conservative number.

17 MR. NETON: This is Jim Neton.
18 There's also some empirical evidence to
19 indicate that that would be unlikely based on
20 four that had been processed similarly at a
21 facility known as Mallinckrodt where they
22 processed four that was up to 70 percent

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1 uranium by weight, as opposed to this ore
2 which was less than 0.02 percent uranium by
3 weight. That is 3500 times higher, and it was
4 unlikely, the measured values of 600 were not
5 seen at Blockson with any amount, I mean
6 Mallinckrodt.

7 As a matter of fact, the average
8 values were much, much, much lower than that.

9 So we do have some evidence that in
10 processing of uranium, I mean of ore of this
11 type and extracting uranium that the levels
12 never really reached those high values that
13 the Monte Carlo calculation predicts.

14 CHAIR MUNN: Any other comments
15 with respect to that specific issue? If not,
16 the next item on our agenda is to review the
17 bounding value determinations and discuss
18 whether it is, indeed, the appropriate task.
19 Jim, would you like to undertake that?

20 MR. NETON: Sure, I'll start off
21 the conversation. I think Bob has done a
22 great job and SC&A, particularly, Bob has done

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1 a great job modeling the information and,
2 indeed, has shown that quite a bit is known
3 about what happened at Blockson in relation to
4 the entire process and the source term and the
5 radionuclide content of the materials. So I
6 think that's a good example there.

7 I'd just like to get back a little
8 bit, though, as to what I believe this
9 analysis was originally intended to do, and
10 that was we had proposed this 2.33 picocurie
11 per liter value that was based on some
12 information we obtained from the Florida
13 Institute of Phosphate Research. And there
14 was some general belief among, I think, at
15 least one or more working group members that
16 that value was pretty low. It didn't seem to
17 ring true because you can see value that high
18 in homes and such.

19 And so this analysis, my
20 recollection was to undertake as sort of a
21 scoping analysis to say does this value make
22 any sense at all, given that the model rate on

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1 radon is one of the few source terms that are
2 using the model, as Bob has demonstrated. And
3 I think the analysis has demonstrated that.
4 In general, the predicted value of radon in
5 the building, at least the 50 percentile, is
6 not that different than the value that we
7 proposed. And, in fact, I would argue that,
8 given the conservatism built in to some of the
9 parameters that we can talk about later, that
10 it's very likely that our value is well within
11 that range. And, in fact, I think someone
12 yesterday acknowledged that, that our value is
13 not necessarily inconsistent with what the
14 model has predicted. I guess I can leave it
15 at that, and open that for discussion.

16 MR. CLAWSON: So let me get
17 something -- now, for Blockson, do we know
18 where all of the ore came from?

19 MR. NETON: Bob could probably
20 answer that better than me, but I do believe
21 we know the assay of the ore pretty well.

22 MR. TOMES: Well, it did come from

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1 Florida. I can't tell you exactly what place
2 in Florida. There may be some information
3 that I don't recall. But we do have the
4 concentration that they typically receive.

5 MR. CLAWSON: They typically got,
6 but we don't have anything for sure of exactly
7 what they had or --

8 MR. TOMES: Not in each and every
9 time, but we do have data on what it was from
10 estimates. Of course, I don't have data on
11 each and every shipment they got.

12 MR. NETON: But I think it's
13 generally known, generally considered, that
14 ore coming from Florida would be no more than
15 0.02 percent uranium by weight. That's sort
16 of the number I have in my mind. I think
17 Blockson was actually slightly less than that,
18 maybe 0.018 percent or something like that.
19 But it's a fairly low uranium content
20 material.

21 MR. CLAWSON: The reason I'm
22 bringing this up is because even with mining

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1 before, I know that we always had a general
2 per ton this is what we've got here. But
3 there was a lot of times where we got into
4 way, way higher than what the normal offset
5 was. And it's kind of interesting to me that
6 we know the general amount that it was rated
7 at and so forth, but we don't even know where
8 it came from basically.

9 DR. ROESSLER: Brad, you're talking
10 about uranium mining, not phosphate rock. I
11 think phosphate rock concentrations are fairly
12 well defined, or at least there's certainly a
13 bounding from Florida rock.

14 MR. NETON: And I think the plant
15 assayed it at some point, and I believe that
16 was covered in the technical file somewhere.

17 MR. TOMES: The research chemist at
18 Blockson, he found some values that he
19 published, 0.014 percent and 0.011 percent.
20 So he did two different documents.

21 MR. NETON: And I believe the model
22 that SC&A developed used slightly higher

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1 values than that.

2 DR. ANIGSTEIN: I have it in
3 becquerel per kilogram. It's 1263 becquerel
4 per kilogram was the mean.

5 MR. NETON: Somewhere in your model
6 you talked about --

7 CHAIR MUNN: But in any case . . .

8 DR. ANIGSTEIN: Well, that was our
9 preliminary, they were our preliminary model
10 that was a very indirect approach to the
11 concentration.

12 MR. NETON: Actually, the source
13 term was 0.014 percent is what it says.

14 DR. ANIGSTEIN: Yes. That was our
15 preliminary model. I think in this one I used
16 the published --

17 MR. NETON: You were higher than
18 0.014 percent?

19 DR. ANIGSTEIN: Again, I have to
20 convert from becquerels and milligrams. So if
21 I remember correctly, it was something like,
22 oh, 25,000 becquerel per gram. I'll get that

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1 ready in a moment.

2 CHAIR MUNN: The salient point is
3 not, as you know, the content of each batch
4 that comes in. The salient point is that you
5 know the maximum that could possibly be, and
6 it's included in the range of the computation
7 that's been done, as I read the report. Is
8 that correct?

9 MR. NETON: Yes.

10 MS. PINCHETTI: Can I mention
11 something? My dad actually says that the rock
12 came from Texas, so I don't know if that has
13 anything to do with anything. But I just
14 thought I'd bring that up.

15 MR. KATZ: I'm sorry. Can you
16 identify yourself again, please?

17 MS. PINCHETTI: I'm sorry. This is
18 Kathy Pinchetti.

19 MR. KATZ: Pinchetti. Thank you,
20 Kathy.

21 MR. NETON: Well, that's the first
22 time we've ever heard anything of that nature.

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1 CHAIR MUNN: Your father said it
2 came from Texas?

3 MS. PINCHETTI: Yes. My dad, the
4 petitioner for 58, yes, he says that the rock
5 came from Texas.

6 CHAIR MUNN: Now, what was his
7 relationship to those shipments? I guess I'm
8 not questioning what he's saying, I'm just --
9 this is an entirely new statement. Perhaps
10 someone else on the Board has heard this, but
11 I've never heard that before, nor have any of
12 the workers in any of the Blockson meetings
13 that I attended personally ever referred to
14 shipments from Texas. They all said the same
15 thing, that it came from Florida. And Florida
16 is the most common source for this particular
17 type of ore, so this is a real shocker. If
18 your father has, if he can provide any
19 additional information, it would certainly be
20 of real interest. If he has anything concrete
21 that we could refer to that would give us that
22 additional information, that would be most

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1 helpful.

2 DR. ROESSLER: Even so, I think the
3 Texas rock is pretty well characterized. I
4 would guess that it might be lower, but I
5 think if Chick is on the phone he might have
6 some information on that.

7 CHAIR MUNN: Are you there, Chick?

8 MR. PHILLIPS: Yes. That is my
9 recollection, too, but I can't put my finger
10 on what I can verify that. But I believe
11 that's correct.

12 CHAIR MUNN: That Texas ore would
13 have, in any case, been lower concentration?

14 MR. PHILLIPS: That's correct. I'm
15 looking through some things here, and I may
16 come up with something in a minute so . . .

17 CHAIR MUNN: Thank you. Do you
18 recall ever having seen any evidence of
19 shipments from any place other than from
20 Florida?

21 MR. PHILLIPS: Are you speaking to
22 me?

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1 CHAIR MUNN: Yes, I am.

2 MR. PHILLIPS: No. This is the
3 first that I've heard of this. Every
4 indication is, I think it was June, said that
5 we have had from the workers' meeting, the
6 transcripts, etcetera, indicate the ore came
7 from Florida.

8 CHAIR MUNN: Yes, I agree. Thank
9 you. And if you find any additional
10 information while you're checking your
11 sources, please interrupt us to let us know.

12 MR. PHILLIPS: Okay. I'm looking
13 now. Thank you.

14 CHAIR MUNN: Thank you. Any other
15 comments about --

16 MR. RINGER: I have a question.

17 CHAIR MUNN: Yes. Please identify
18 yourself.

19 MR. RINGER: Yes. My name is
20 Harold Ringer from Joliet, Illinois.

21 MR. KATZ: I'm sorry. Can you say
22 that again?

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1 MR. RINGER: Yes. My name is
2 Harold Ringer. I'm from Joliet, Illinois.

3 MR. KATZ: Harold Ringer?

4 MR. RINGER: Right.

5 MR. KATZ: Thank you.

6 MR. RINGER: Okay. Could you give
7 me a mandate when this material was delivered
8 to Joliet at Blockson?

9 CHAIR MUNN: The period of years
10 covered. Just a moment.

11 MR. TOMES: This is Tom Tomes.
12 Blockson was already receiving the material
13 before the AEC became involved with their
14 contract with Blockson, and the AEC started
15 their first contract with Blockson in 1951.

16 MR. RINGER: Okay. 1951. Can you
17 give me a date on that in 1951? My father
18 started October of 1950, and his evaluation
19 wasn't started until about the mid-1951. Is
20 that supposed to be correct or not?

21 MR. TOMES: Well, the research
22 contracted Blockson to develop the process,

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1 but the contract was signed in March 1951.

2 MR. RINGER: Okay, thank you.

3 DR. ANIGSTEIN: I have a number,
4 and the number we used actually is lower.
5 It's roughly 0.005 percent. So I was just
6 using, off the top of my head, the conversion
7 for the specific activity of uranium. So it's
8 about one-third, so actually that's a low
9 number. I think that the 0.014 percent was an
10 optimistic number. That's what they hoped to
11 get. They were trying to convince the AEC to
12 get the contract; so, naturally, like a
13 contractor does, they tend to highball the
14 results. From all the literature that I
15 found, they never actually had an assay. So I
16 think, if anything, the number we used was on
17 the low side.

18 MR. NETON: It had a range on it,
19 or was that --

20 DR. ANIGSTEIN: Yes, yes. The
21 range, it was basically based on ten assays.
22 No, there were ten samples and 13 analyses. I

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1 guess some samples were analyzed more than
2 once. And the mean was 1263 becquerel per
3 gram, the standard deviation was 442, the
4 range was from 848 to 1980. So it's, roughly,
5 three, no, roughly twofold range.

6 MR. NETON: And the assay was done
7 by?

8 DR. ANIGSTEIN: Hull and Burnett.
9 Burnett, I spoke to several times the
10 professor at the University of --

11 MR. NETON: Florida?

12 DR. ANIGSTEIN: No, Florida State
13 University, two different universities. And
14 he's the one who also, I guess Hull was
15 probably his graduate student. He also did a
16 study. He pointed out to me the study he did
17 for the Florida Institute of Phosphate
18 Research earlier on the emanation coefficient
19 from various Florida rock.

20 MR. NETON: I think, in general, I
21 would say that the SC&A analysis demonstrates
22 that, given first-term and first principal,

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1 one can model the potential radon
2 concentrations in the building. And somewhat,
3 by definition, that's a founding analysis that
4 can be done. So that analysis indicates that
5 if we can bound it then the debate then
6 becomes what is the real value? Is it the
7 value that we've used, or is it some value
8 more central with the distribution that SC&A
9 proposed? But in my mind, then that becomes a
10 profile issue.

11 CHAIR MUNN: But in any case, the
12 question of whether the bounding value that's
13 being used is the appropriate value, that is
14 the question that needs, that was raised at
15 the last board meeting and one I hope that we
16 can agree about and come to some conclusion
17 here in this workgroup meeting before we go
18 back to the Board.

19 MR. ELLIOTT: Well, for some
20 information, I would offer that we feel that
21 the number we're using is a good scientific
22 number and is climate favorable. And we think

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1 that we see that in the outcome of our dose
2 reconstructions for claimants for this
3 facility. We have currently 53 that are
4 greater than 50 percent that are done, and 23
5 that are less than 50 percent POC. We've
6 completed 117 dose reconstructions out of 121
7 total claims. So as DOL works these through
8 the adjudication process, we expect to see
9 that, at kind of a POC percentage, continue.

10 MR. NETON: I have one handout that
11 I e-mailed to people, but maybe you can pass
12 these around. This is to just sort of bracket
13 the issue a little better. I'm a firm
14 believer in data. I mean, models are fine. I
15 like the old adage that all models are wrong,
16 but some are useful. But I think this is a
17 very useful model that SC&A has put together.

18 I put on this little handout, you know, what
19 do we know about radon levels in wet phosphate
20 process buildings? And the literature are
21 fairly sparse in this area, and it's hard to
22 go back before the mid-1970s because, frankly,

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1 they just didn't make the measurements or
2 didn't report them. But Bob is right and SC&A
3 is correct that it's very difficult to come up
4 with some values.

5 But if you look up all these
6 measurements, they are all below and mostly
7 very much below the value that we're using in
8 our site profile. There was some concern that
9 the 2.33 number that we came up with was bias
10 low because the values were from Florida where
11 it was a more, at least thought to be, a
12 potentially more open structure, an open
13 building with better ventilation. So I went
14 back and pulled out some values that were
15 taken in Idaho at various facilities in 1975
16 by either the EPA or NIOSH had done some work
17 in 1976 in a western Idaho plant. And all
18 these values again are fractions of the value
19 of 2.33 picocuries per liter that we're
20 ascribing. I might have do a little bit of
21 conversion. Some of the value reporting and
22 working levels, if there was 100 percent

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1 equilibrium of the radon with the progeny in
2 the air, the working levels would be
3 equivalent times 100 picocuries per liter.
4 That's probably not the case, but to give you
5 some rough comparison values.

6 These are all very low values.
7 Admittedly, they were in 1976, not in the
8 1950s when what we're trying to develop. But
9 then remember we have these values in 1983 in
10 Blockson that were taken in that one
11 industrial hygiene study that's listed here at
12 the second to the last location on this sheet.

13 And there's just not very much radon there.
14 Then the question became, well, okay NIOSH has
15 2.33 picocuries per liter. We're using it as
16 an upper bound. We have a measurement in 1983
17 in the facility that is at least a factor of
18 five, it's about a factor of five lower than
19 what we're ascribing. And then the question
20 came about, well, are there differences in
21 ventilation?

22 So then we went on this path of

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1 interviewing workers and such, and, lo and
2 behold, there were some differences in
3 ventilation or some upgrades in ventilation in
4 the 60s and 70s, that sort of thing. And then
5 the central question became, well, since radon
6 concentration is directly proportional to the
7 ventilation rate essentially, would there have
8 been a factor of five increase in ventilation
9 between 1953 and 1983 so that the values would
10 be lower than what were actually measured? We
11 see nothing, in my mind, to indicate that
12 that's the case.

13 So I still feel that our number of
14 2.33 picocuries per liter is bounding for
15 these exposures, given that just not much
16 radon occurs in these plants during these
17 processes. One thing I'll mention, as Bob
18 pointed out very clearly, that the digester
19 tank, the sulfuric acid digester process, is
20 probably, except for the ventilation, the most
21 critical value. How much of that radon gets
22 out of that tank?

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1 I would suggest that this is a hot
2 sulfuric acid tank that was not directly
3 vented to the facility itself. You could
4 choke the workers. You can't hot sulfuric
5 acid vent. So workers did indicate that, even
6 in the 1950s, there was ventilation over the
7 top of these tanks. There were improvements
8 later on but --

9 DR. ANIGSTEIN: Now, according to
10 one worker, again, there were three workers
11 interviewed, one would not even work in the
12 building, so you really go down to two. And
13 one of them said that there was a plastic cone
14 that he called like an inverted ice cream
15 cone that was installed over the digester tank
16 later in the 60s and 70s. And sulfuric acid
17 is not volatile. It has a very, very low
18 vapor, particularly if it's mixed with or
19 diluted with water. So you don't get fumes
20 from sulfuric acid.

21 MR. NETON: When it's heated?

22 DR. ANIGSTEIN: Pardon?

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1 MR. NETON: When it's heated? I
2 beg to differ.

3 DR. ANIGSTEIN: Well, I mean, okay,
4 it's very acrid, so a very small amount would
5 be. But I think, just based on my experience,
6 I was a chemist before I was a physicist --

7 MR. NETON: So was I, so let's
8 compare notes.

9 DR. ANIGSTEIN: -- and I don't
10 think 30 percent sulfuric acid would give out
11 much uranium. That's a purely, you know, it's
12 not a scientific opinion.

13 MR. NETON: Well, I would say that
14 they saw these cones over tanks, but, Tom, you
15 can help me out here, I believe that they
16 indicated that they were vented. The cones
17 actually just created a better capture, you
18 know, situation for the fumes.

19 MR. TOMES: They improved the
20 ventilation by those cones.

21 DR. ANIGSTEIN: There was no
22 forced, that in the 50s there was no forced

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1 ventilation. Another one said there was. One
2 said that it was upgraded, and another one
3 said it was installed later, that earlier
4 there was no forced ventilation. So, again,
5 it's a 50/50 proposition who you believe.

6 MR. NETON: And another thing, I've
7 been looking through this quite a bit, and
8 I've gone back to the Mallinckrodt scenario,
9 which was not a phosphate plant, but they
10 digested uranium ore, extracted the uranium,
11 slurried it, a very similar process, had it in
12 specific digester tanks, sulfuric acid
13 precipitation, that sort of thing, and ORAU,
14 in the 1980s, did an analysis of the workers
15 at Mallinckrodt specifically for radon
16 exposure. In between like 1946 and 1953,
17 which were the peak years when there was some
18 very high levels of uranium-bearing ore coming
19 through there, the highest worker, by far,
20 they calculated had an exposure that was no
21 greater than 15 times what we're assigning for
22 Blockson Chemical, even given that the radium

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1 source term was 3500, up to 3500 times
2 greater. And this was back in the early 40s
3 or late 40s - early 50s, when the ventilation
4 was not very good in that plant. So I have
5 trouble reconciling those two facts.

6 DR. ANIGSTEIN: Wasn't some of the
7 Mallinckrodt, I remember going over the
8 Mallinckrodt report, wasn't a lot of the
9 Mallinckrodt ore pre-processed to remove the
10 radium?

11 MR. NETON: The Belgian Congo ore
12 was not. It was 70 percent uranium by weight.
13 Some of this later stuff was, but Belgian
14 Congo ore, when it came through there, was
15 about 70 percent uranium by weight and,
16 presumably, that was an equilibrium with the
17 rating. That's where they got in trouble with
18 this. They had very high concentrations in
19 some of the storage areas. By and large, the
20 plant concentrations themselves were of a
21 value, on average, typical to what the 95th
22 percentile projection that Blockson come up

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1 with, which makes me somewhat suspicious. How
2 can you have uranium ore that's a thousand or
3 more times higher in radium and had levels
4 that are matching what the model predicts?

5 DR. ROESSLER: To me, the number
6 you came up with really depends on your
7 equation where you have the F in that. I'm
8 kind of remembering it now. We really don't
9 know what F is, but it goes between zero and
10 one. Now, and then when you say one, there's
11 where you really come up with that high value,
12 and, to me, that's really stretching it.
13 There must be a reasonable number that you can
14 model. It's not reasonable that it's zero.
15 It's not reasonable that it's one. You know
16 that. So I think that by putting that range
17 in there and then doing your Monte Carlo, it's
18 just stretched it way out of reason.

19 DR. ANIGSTEIN: Well, the problem
20 with that guidance which I got second hand
21 while I worked on a study for NRC where they
22 did, again, tiny radiation doses for purposes

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1 of clearance of materials from nuclear
2 facilities, and the rule was that if you don't
3 know, if lack of better information, if you
4 have a range and all you know is the range,
5 you have to give it uniform distribution from
6 the lowest to the highest round.

7 DR. ROESSLER: And was that with
8 regard to F?

9 DR. ANIGSTEIN: Pardon me?

10 DR. ROESSLER: That was with regard
11 to this --

12 DR. ANIGSTEIN: No, no, no. I'm
13 just saying --

14 DR. ROESSLER: Just in general?

15 DR. ANIGSTEIN: -- general
16 principle.

17 DR. ROESSLER: I think what I'm
18 saying is your range does not make any sense.

19 It's not reasonable at all. It's just far
20 out.

21 CHAIR MUNN: It's too great a
22 range.

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1 DR. ROESSLER: Well, I mean, to go
2 from zero to one is --

3 DR. ANIGSTEIN: I mean, basically,
4 it's a statement of our ignorance. We don't
5 know.

6 MR. NETON: Well, the other thing
7 that's driving this also is the fact that I
8 think the lower limit of the building
9 ventilation rate is 0.1 turnover.

10 DR. ANIGSTEIN: We have seen, there
11 is a --

12 MR. NETON: I think that's way, way
13 low. I mean --

14 DR. ANIGSTEIN: Again, I was
15 referring to a published study --

16 MR. NETON: I know you read
17 Battelle.

18 DR. ANIGSTEIN: Pardon?

19 MR. NETON: Yes, go ahead.

20 DR. ANIGSTEIN: Yes, by Battelle
21 where they had a warehouse which had no forced
22 ventilation. And during working hours they

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1 said they took two measurements, one in the
2 morning and one in the afternoon, and they
3 came up with 0.05 and 0.2. So they just took
4 the average of that, the mean --

5 MR. NETON: The warehouse --

6 DR. ANIGSTEIN: - the median, the
7 geometric mean and called it 0.1.

8 MR. NETON: Yes, I'm not sure how
9 representative that is. I mean, you've heard
10 John Mauro spoke to Mort Lippmann, an expert
11 in industrial hygiene ventilation issues,
12 stating that one would certainly be a lower
13 bound for building ventilation for a building
14 of that type.

15 DR. ANIGSTEIN: Well --

16 MR. NETON: And I have to point out
17 if you move this F value to a reasonable value
18 and building, the 0.1, which drives the high
19 value that's been modified a little bit, I
20 think you're going to end up with a value
21 that's similar to what we're proposing is
22 where I'm coming --

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1 DR. ROESSLER: Not just a
2 reasonable value but a reasonably high value.

3 MR. NETON: Yes, I think so.

4 DR. ROESSLER: Because one is not
5 reasonable.

6 MR. NETON: And I guess that's my
7 point. We can quibble on the parameters that
8 SC&A has selected. I don't quibble about the
9 model. I think the model is done properly.
10 But if you adjust the parameters, that's where
11 we're at. We're coming down to what are the
12 appropriate parameters and how does that
13 compare to the value that NIOSH has proposed?

14 And I would still assert that that is not an
15 SEC issue. That is a matter of where that
16 fixed value or that distribution of value
17 lies. I think we have plenty of data in a
18 number of different facilities to indicate
19 radon exposures are fairly low. How low they
20 are is in debate right now. If not, can we
21 put an upper limit on the radon level in a
22 facility to process or that have up to 0.02

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1 percent uranium by weight. I can't imagine we
2 can't bound it. I think we have.

3 DR. MELIUS: Can we go back to your
4 one-page handout? Are these reports on the O:
5 drive where we can see them?

6 DR. ROESSLER: I think they are.

7 DR. MELIUS: I think we've already
8 talked about the last report.

9 MR. NETON: I believe they are.
10 I'd have to go back and check. It's been such
11 a long time since we've talked about this, but
12 I believe all of these were used in our --
13 certainly, the FIPR report is on there, the
14 Blockson report is on there. The two NIOSH
15 reports I'm not certain.

16 DR. MELIUS: Because I recall at
17 one point either NIOSH or SC&A were looking
18 for additional reports from other -- those
19 are, I think, sort of a geographic question.
20 Could we get reports from northern --

21 MR. NETON: Right. And that's why
22 --

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1 DR. MELIUS: I guess I'm asking two
2 questions. One is what's here on the O:
3 drive. Secondly, is what's here the universe
4 of what was found when you went looking for
5 these reports? I recall someone saying there
6 was very few little data, so I'm not surprised
7 that this is it. I'm just --

8 MR. NETON: I believe this is the
9 universe of reported radon levels in phosphate
10 plants that we have.

11 DR. MELIUS: Okay.

12 MR. NETON: I cannot guarantee you
13 that all of these are on the O: drive. We can
14 check.

15 DR. MELIUS: And then the
16 Mallinckrodt data that you referenced, it's
17 been a long time since we looked at
18 Mallinckrodt.

19 MR. NETON: Well, these are all
20 right out of Mallinckrodt's profile, so
21 they're out there.

22 DR. MELIUS: Okay, okay. I haven't

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1 looked for --

2 MR. NETON: I just excerpted the
3 pages right out.

4 DR. MELIUS: Get it off my mind,
5 right?

6 MR. NETON: Yes, that ORAU study
7 they did in '85 as part of an epidemiologic
8 evaluation.

9 DR. MELIUS: Investigation.

10 MR. NETON: It's fairly interesting
11 to me. They did a time-weighted average using
12 all the radon value around the plant, and they
13 couldn't get above 1.5 working level months
14 per year in any of those workers. And then
15 there was a couple of job categories, and then
16 it dropped down precipitously from there. And
17 we are assigning 0.12 or something of that
18 nature working level months per year.

19 MR. PHILLIPS: This is Chick
20 Phillips. I think you were referring, I
21 looked into the study that's referred to here
22 as the Pocatello study, the EPA study, and

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1 tried to verify that those measurements,
2 particularly those in the grinding building
3 and the control room, were made in an enclosed
4 building, and I was never able to verify that.

5 DR. ROESSLER: Why would they make
6 them, other than they say the grinder
7 building. Maybe I misunderstand. Why would
8 they make them anywhere other than in the
9 building?

10 MR. NETON: Well, Chick just said
11 they might have been open buildings.

12 DR. ROESSLER: Open.

13 MR. CLAWSON: Well, you've also got
14 to understand what this report comes from,
15 too, and the reason that it's the EPA is
16 because we have to tear up 350 miles of road,
17 we have to tear out over 100 homes because
18 they had taken the rock because it was so
19 nicely refined and crushed they put it into
20 asphalt and put it out on the roads, which the
21 EPA basically came back in and that there was
22 endangerment to the lives of people and so

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1 forth, and we had to dig up all these roads
2 and homes.

3 DR. MELIUS: Fifty streetlights.

4 MR. CLAWSON: That's where a lot of
5 this came into, and they were trying to figure
6 out what they were actually waiting for. And
7 I could tell you the name but under privacy
8 and everything else like that. But we
9 remember this quite well because one of the
10 sites we had to tear down part of the
11 foundation because they had used rock from
12 Pocatello, and it was a very higher rate of
13 radon. That's what created the issue.

14 DR. ROESSLER: What impact does
15 that have on the numbers do you think?

16 MR. CLAWSON: Well, basically, I've
17 been hearing a lot higher numbers than that.
18 I was hearing numbers, especially in enclosed
19 buildings and so forth like that, of radon
20 levels; but I'd have to go back and look at
21 what we were doing. The reason that this just
22 sparks to me is because we had began to build

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1 a facility out there which used a contractor
2 from Pocatello that used their cement plant,
3 and we couldn't use some of our radiation, our
4 CAMs, or anything else like that because there
5 was too much radon. It was over over-REM-ing
6 us, and they had come to find out that's kind
7 of what started the background into it was
8 that they were using this material and it had,
9 was putting off radon and so forth. This was
10 part of that.

11 DR. ROESSLER: Well, I've never
12 been to Pocatello in the winter, but I had a
13 hard time picturing that they would be doing
14 grinding outdoors. What is --

15 MR. CLAWSON: They're open
16 buildings, meaning the buildings got sides,
17 the roof has come up, and they've got gaps up
18 to the top that basically run through there.
19 And they use the natural convection to be able
20 to clear out the facility. If you go out
21 Pocatello headed toward Boise, you'd see all
22 the facilities along there and what type of

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1 buildings that they are. They go in a random
2 start where the cars come in. Now it's a
3 slurry mix coming, and it starts at one end
4 and works all the way out to the other end.
5 They're not heated buildings. A lot of them
6 aren't heated and so forth like that, only the
7 objects that need to be kept freezed or
8 heated. They're just an open building.

9 CHAIR MUNN: They were doing
10 highway with phosphate rock?

11 MR. CLAWSON: Yes, after it had run
12 through the process.

13 DR. ANIGSTEIN: That's the major
14 use of phosphate rock that pass through the --

15 MR. NETON: They built a number of
16 school foundations out west out of that.

17 CHAIR MUNN: Yes, I remember that.
18 So we've heard a considerable amount of
19 discussion about the bounding value
20 determinations here. The question that the
21 Board asked us to identify is whether the
22 bounding value that was being used was the

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1 appropriate value. It appears that -- is
2 there any argument over the fact that it's
3 possible to bound this? There's no
4 disagreement --

5 MR. CLAWSON: I guess my thing is
6 is, sure, I can throw any number out there. I
7 can throw a number out there and say, sure,
8 this is going to bound it, but is it feasible
9 that that's right or not would be my question.

10 CHAIR MUNN: And that's the
11 question we're trying to determine here.
12 That's what I'm asking. We have the data
13 that's been set before us with respect to the
14 ore itself, what the product was, what the
15 possible exposure could have been. Is there
16 any valid reason to believe that the value
17 that's been chosen as the bounding value for
18 determination in the claimant cases is not an
19 appropriate value?

20 DR. MELIUS: What number are you
21 referring to? You're referring to a NIOSH
22 number?

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1 CHAIR MUNN: Yes, the number that's
2 being used to bound --

3 DR. MELIUS: Okay. Based on the --

4 CHAIR MUNN: -- for dose
5 reconstruction.

6 DR. MELIUS: Yes, I think there's
7 valid reasons. The valid reasons are
8 contained in this report, the SC&A report.

9 CHAIR MUNN: And they are? Let's
10 enumerate them for the record. Those reasons
11 are?

12 DR. ROESSLER: Are you looking at
13 Bob's report that came just a couple of days
14 ago? Is that what you're --

15 DR. MELIUS: I don't have a report
16 from Bob that came a couple of days ago.

17 DR. ROESSLER: I'm wondering what
18 report you're looking at. Can you --

19 DR. MELIUS: The SC&A report we got
20 in August, I believe.

21 DR. ANIGSTEIN: You didn't send
22 anything else.

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1 DR. ROESSLER: I'm looking for it.
2 I can't find it. Is it on the web site?

3 CHAIR MUNN: Evaluation of radon
4 levels in Building 40 at Blockson Chemical.

5 DR. MELIUS: Yes, so August --

6 CHAIR MUNN: Dated August 12th.

7 DR. MELIUS: -- 12th was the
8 Privacy Act cleared one.

9 MR. NETON: What Bob presented.

10 DR. MELIUS: Yes.

11 CHAIR MUNN: Okay. That's a
12 considerable text and explanation.

13 DR. ANIGSTEIN: The block diagram I
14 don't have but everything else was listed from
15 the report.

16 CHAIR MUNN: Including the Monte
17 Carlo analysis?

18 DR. ANIGSTEIN: Yes.

19 CHAIR MUNN: And the modeling of
20 the facility?

21 DR. MELIUS: Appendix B has the
22 Monte Carlo analysis.

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1 DR. ANIGSTEIN: Yes.

2 DR. MELIUS: That's what I asked
3 earlier.

4 DR. ANIGSTEIN: It had the details
5 all along the front part.

6 CHAIR MUNN: Have you found it,
7 Gen?

8 DR. ROESSLER: Yes.

9 CHAIR MUNN: Fairly comprehensive
10 report.

11 DR. ROESSLER: So what are your
12 recommendations, Jim, based on that report
13 then?

14 DR. MELIUS: What I'm trying to do
15 is learn what information is available. Jim
16 has presented some new information. We've
17 heard, at least from my first time, I have a
18 clear understanding of what SC&A is
19 approaching. There's a disagreement between
20 SC&A and NIOSH on the implications of SC&A's
21 modeling let's call it, and Jim has presented
22 saying, well, he would rather rely on

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1 available sampling data from various sites,
2 which is a legitimate argument. And he's
3 presented some without a lot of detail, but
4 there's not much time, and that's why I wanted
5 to look at the reports.

6 And I think you have raised some
7 issues about the SC&A model, as has Jim, as to
8 whether the parameters in there are
9 appropriate, at least the range of parameters.

10 That's fair to do and legitimate, and I think
11 we need to look over that. I'm not sure
12 changing the range of parameters changes the
13 basic distribution that much. It will change
14 the tails of it, the 95th percentile, but how
15 much of an impact it would have on what their
16 overall argument is I don't know. But I --

17 DR. ROESSLER: But you agree, I
18 would assume from saying that, that this can
19 be bounded?

20 DR. MELIUS: No. I mean, there are
21 ways of bounding it, are they appropriate ways
22 for this program?

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1 DR. ROESSLER: So how do we get to
2 that point?

3 DR. MELIUS: Well, I don't know if
4 we can.

5 DR. ROESSLER: What do you --

6 DR. MELIUS: Without data, how do
7 we get to that point?

8 DR. ROESSLER: Well, I've presented
9 a lot of data, some of which I think is not
10 appropriate. It certainly is way, way, I
11 don't think the word is even conservative.
12 But it certainly includes the extreme upper
13 bounds.

14 DR. MELIUS: Yes, but listen. I
15 think any place in this program we can come up
16 with extreme upper bounds for anything. So
17 the question is are those, you know,
18 justifiable upper bounds?

19 DR. ROESSLER: Exactly.

20 DR. MELIUS: I think that's what
21 we're struggling with in the absence of data,
22 primary data from the site.

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1 CHAIR MUNN: Would it be of any
2 value to us to take a short period of time to
3 review the material that we have in front of
4 us right here? Or are we asking the wrong
5 questions in order to try to find an answer to
6 is this an appropriate value? It's difficult
7 to know how to proceed in the face of
8 information that we have that we've had for
9 quite some time. We've attempted to come to
10 some conclusions with the data presented.
11 Given what we know about the low quantities of
12 exposure that are possible from this type of
13 ore and from this type of process, it's
14 difficult to see a path forward beyond what
15 we've done.

16 We have accumulated a significant
17 body of information and have very well-
18 qualified individuals providing that
19 information to us. So if nothing more can be
20 presented in the way of material, if we cannot
21 get other expressions of what an appropriate
22 value would be in limited exposure situations

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1 like this, proceeding is difficult. Is it the
2 feel of the folks who are here that, looking
3 at this material a little bit, will bring us
4 any additional clarification or any change in
5 position or not?

6 DR. MELIUS: Well, my understanding
7 was that Jim presented this table or
8 circulated this table last week as new
9 information or an expression of maybe old
10 information in this setting, which I think
11 that's legitimate and I'd like to take a look
12 at those reports. It's not something I was
13 aware of earlier, at least not all of them.
14 And I --

15 MR. CLAWSON: I believe somebody is
16 trying to talk.

17 CHAIR MUNN: No, I think they're
18 talking behind, I think they have not muted
19 their phone and their conversation is coming
20 through to us.

21 DR. MELIUS: And I think that
22 either Larry or Jim presented, which I didn't

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1 see from the last meeting but maybe I missed
2 it, I mean I missed the meeting, but I didn't
3 see in the transcripts. So I understand
4 NIOSH's position is that you're sticking with
5 your original radon report recommendation?

6 MR. ELLIOTT: We feel it's
7 sufficiently accurate.

8 DR. MELIUS: Okay. I missed that
9 last time. And last time, I was confused, I
10 think, about the SC&A report. It was arguing
11 with itself. I mean, I couldn't -- I mean,
12 it's sort of playing NIOSH and SC&A, and I
13 couldn't tell what the bottom line was.

14 MR. NETON: Yes, and I really
15 thought, as I said earlier, the SC&A report
16 was, I believe, initiated as a reasonableness
17 check on the number that we were using. And,
18 in fact, they've come out with a distribution
19 which includes our value. Admittedly, it's at
20 the 15th or 17th percentile their
21 distribution, but then we're left at the
22 situation now where we believe that model has

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1 some ultra-conservatism built into it that if
2 we adjusted the parameters to reflect reality
3 a little better, our number is right in there.

4 I think, to some extent, SC&A has provided
5 some validation to our model, if we can agree
6 to adjust the parameters to where we think
7 they are.

8 That's the best case. The worst
9 case is they've demonstrated that the bounding
10 values can be generated, given the knowledge
11 that we have of the site: the source term, the
12 release rates of radon, that sort of thing.
13 If there's anything that can be done with a
14 source term model, radon is probably the
15 poster child for that because of its noble gas
16 qualities.

17 CHAIR MUNN: Chick, are you still
18 on the line?

19 MR. PHILLIPS: I am.

20 CHAIR MUNN: Do you have any
21 comment or anything to add to this current
22 discussion?

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1 MR. PHILLIPS: I think what we have
2 done is to do exactly what I believe Jim said,
3 and that is that we have attempted to look at
4 the situation and, you know, do a scoping
5 analysis of what it potentially could have
6 been. And, of course, when you do that, if
7 you consider the full range of potential
8 values, in particular Bob earlier referred to
9 two of those values that have a great impact
10 on which we have no way of really evaluating,
11 and that is the release fraction from the ore
12 during the digesting process and then, in
13 fact, what the effective ventilation rate is
14 in the area of those digesters, not just the
15 building but those digesters. And that was
16 referred to earlier about the ventilation
17 specifically for those.

18 So in the absence of that, just
19 putting in the full range of values, you see
20 the potential. That is, if you believe in the
21 model, and I think the model is good, you see
22 what the full range of values you can get and

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1 then you try to temper those against what the
2 measurements that were made, including one
3 that was made in that building itself. And so
4 then you have to make a decision as to which
5 one, you know, how reasonable are those full
6 range of values. You know, I haven't added
7 anything to the conversation, but I think
8 that's where we are.

9 CHAIR MUNN: Well, Chick, let me
10 ask you one more thing. It's our
11 understanding from everything that the workers
12 have told us that this building was a very low
13 habitation rate building. There were very few
14 workers in there at any given time and that
15 the workers who were there did not have an
16 assigned job that they stayed with all day
17 long, that they moved about from one to the
18 other job either during the day or during the
19 week or during their period of employment. So
20 it's not one of those cases where we can
21 identify a worker as having been in a specific
22 area of the building for the preponderance of

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1 the time worked. They instead had many areas
2 in the building that they routinely went
3 through.

4 Now, given that and what you have
5 just said with respect to the difference
6 between SC&A's approach to doing these
7 bounding calculations and the NIOSH approach
8 to the bounding calculations, I'd like to ask
9 one other thing. It's been stated here today
10 that there's a difference that is perceived as
11 significant between the SC&A's position with
12 regard to these bounding values and to the
13 NIOSH position regarding bounding values. Is
14 that perception accurate? And if so, can we
15 resolve that here today?

16 MR. PHILLIPS: I'm not sure exactly
17 what -- is the question is there a difference
18 between the proposed bounding value that NIOSH
19 has presented and the scoping analysis that
20 SC&A did? Is that the question?

21 CHAIR MUNN: Essentially, what is
22 the current position between SC&A and their

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1 bounding value calculations and NIOSH's
2 position with respect to bounding
3 calculations? Is there a significant
4 difference, and if there is can we resolve
5 that here today?

6 MR. PHILLIPS: I can't answer the
7 last part of whether that can be resolved
8 today, but I think my summary would be the
9 same as -- was it Jim giving the summary? I
10 can't tell from here.

11 CHAIR MUNN: Yes, it was.

12 MR. PHILLIPS: The value, the
13 bounding value proposed is included in our
14 scoping analysis. It's a question of, you
15 know, how you view the wide range of values
16 that you can generate when you include all the
17 possibilities. Again, I have to say that you
18 have to temper that against the measurements
19 that have been made, which they have
20 summarized, which NIOSH has summarized in the
21 table, and remember that at least one of those
22 values was made in the building in question.

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1 CHAIR MUNN: I guess perhaps I
2 should ask Jim the same question. Do you
3 perceive there to be a significant difference
4 between your view of how to proceed with
5 bounding values and SC&A? Because it's been
6 stated here that there's a difference, and if
7 there is a difference and that is creating
8 concern for Board members, then it behooves us
9 to try to resolve that difference. When
10 listening to you, what you are saying sounds
11 reasonable to me. When listening to SC&A, it
12 sounds reasonable to me and it sounds to me as
13 though there is really not that much
14 difference between the two positions. But as
15 long as there's a perception there's a
16 difference, we need to either clear up that
17 perception or try to resolve this one way or
18 the other.

19 MR. NETON: I hate to do this, but
20 I think I'm going to have to answer your
21 question with another question.

22 CHAIR MUNN: Okay.

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1 MR. NETON: And the question I have
2 is does SC&A believe that the model that they
3 developed represents a plausibly bounding
4 scenario for radon exposure at Blockson
5 Chemical? I think it says so in this document
6 somewhere.

7 CHAIR MUNN: Yes, it does.

8 MR. NETON: And if they agree to
9 that, then we both have bounding values. Ours
10 is lower than what they would bound, and I'm
11 not sure whether they're suggesting that the
12 95th percentile is plausibly bounding or
13 whether some triangular distribution with the
14 50th percentile and the 5th and 95th as the
15 end point. I'm not sure; but, nonetheless, if
16 they say that they can plausibly bound these
17 values, then we've got a starting point here.
18 We believe that our plausibly bounding value
19 is a little lower than what their central
20 estimate is.

21 So to that extent, we're not that
22 far off. We just have to figure out where

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1 that value lies within the universe of values
2 that SC&A has calculated. Nonetheless,
3 agreeing that their model contains a plausible
4 value somewhere in there that might need to be
5 refined given our uncomfort with some of the
6 parameter selections, the range of parameter
7 selection.

8 I don't know if that answers you or
9 not, but you see where I'm going with this. I
10 think that they believe that this is a
11 plausible value. I've heard Dr. Melius though
12 say he's not convinced that the SC&A model is
13 plausibly bounding, and I think Brad expressed
14 some discomfort with that. And so unless that
15 can be agreed to no matter what we argue here,
16 it's not going to go anywhere because then
17 we're just going to be refining a model that
18 no one has agreed to is useful for plausibly
19 bounding these things.

20 CHAIR MUNN: That's true. And what
21 I was hearing, I think, perhaps I misheard,
22 Dr. Melius and what Mr. Clawson were saying.

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1 But I thought I heard the concern is that
2 there is a difference between the positions of
3 NIOSH and SC&A with respect to whether the
4 bounding value is the appropriate value. Did
5 I mishear that? Is that the question? Or is
6 the issue that a bounding value is not going
7 to be accepted under any terms, given the
8 information we have now?

9 MR. CLAWSON: Let's turn this
10 question around, Wanda. What you're telling
11 me is that all the information that we have in
12 here is exact and correct and that we have all
13 the information to be able to do this process,
14 that we've got everything that we're going to
15 be able to do on this, bound everything?
16 There's still, in my eyes, there's still, and
17 this is my personal opinion and I'm not
18 speaking for Dr. Melius or anybody else, there
19 is enough -- this information, I guess I would
20 say, you know, we've got a lot of facts, we
21 have a few sample here, and we can arrange a
22 few numbers around and we can come to a

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1 bounding built on any site, any place, that is
2 is, within this law, is it feasible?

3 I still have, my personal opinion
4 is I still have a lot of mistrust from the
5 information. I think there's still, you know,
6 we've got NIOSH on one side and SC&A on the
7 other saying, well, you know, we're not quite
8 here. I put myself into the position of the
9 petitioner. These people really can't even
10 agree on a dose. I still have a hard time
11 with the issue. I still have a hard time with
12 the information that we've got. I think that
13 there's still a lot of voids in it. There's a
14 lot of dark area, and I'd just, I take myself
15 into account because I'm sitting there working
16 in a nuclear facility right now with state-of-
17 the-art equipment and everything else like
18 this, and they cannot even take and run our
19 radon. We have a radon in flux, if we lose
20 any kind of ventilation we have to evacuate
21 our building. And we have a hard time
22 monitoring this stuff, and I just, I really

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1 have an uncertainty for it. Maybe a lot of it
2 is just my personal thing there. It's still
3 got a lot of gaps.

4 CHAIR MUNN: We are never going to
5 have perfect information on any site we go to
6 ever. No one has ever anticipated that we
7 would have perfect information. We will
8 always have people who will feel that there
9 are gaps in information that is the best
10 information available anywhere in the world.
11 This isn't one of those places, and we have
12 never said that it was.

13 MR. CLAWSON: So aren't we supposed
14 to err on the side of the claimant?

15 CHAIR MUNN: What we're supposed to
16 do is do the best science possible and to make
17 sure that what we do is reasonable. That's
18 our responsibility here. And the argument
19 that there's a difference between what is
20 happening, what SC&A's position is and NIOSH's
21 position is a bit questionable because what
22 I'm hearing and what SC&A has said from the

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1 outset is we're good to go here. Their
2 expectations incorporate that they are larger
3 than, they expand further than, but they
4 incorporate the values that have been
5 determined by NIOSH.

6 Now, we're not going to have every
7 question that is raised answered. It's
8 impossible. But we do know a great deal about
9 radon, about how it behaves. We know a
10 considerable amount of information about this
11 ore. And even though we do not have absolute
12 numbers to say this is what happens everyday
13 in this plant, we never have that anywhere,
14 we, nevertheless, have valid information that
15 any reasonable person would accept as it
16 couldn't have been larger than that. Given
17 the circumstances that we know to be real, it
18 couldn't have been greater than that.

19 Let me read verbatim what the
20 evaluation of radon levels at Building 40 at
21 Blockson Chemical, which was provided by SC&A
22 following our first concerns that were raised

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1 in the working group about this. "The results
2 indicate that the default value of 2.33
3 picocuries per liter selected by NIOSH in
4 OTIB-0043 falls within the range of values
5 that may, in fact, be an appropriate value,
6 especially if only a small fraction of the
7 radon in the ore entered Building 40 escapes
8 from the ore during the grinding and digesting
9 process and enters the Building 40 atmosphere.

10 However, given the large uncertainties in
11 radon release fractions from the ore during
12 crushing and digesting and the uncertainty in
13 the air exchange rate for Building 40, a
14 higher default value may be needed. For
15 example, the result of this analysis indicates
16 that one can be 95 percent confident that the
17 average airborne radon concentration in
18 Building 40 during the qualified period was
19 less than 42 picocuries per liter."

20 That does not seem to be any great
21 disagreement with what NIOSH has proposed.
22 NIOSH is proposing a default value that is

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1 larger than this 95 percent confidence level.

2 MR. CLAWSON: I think you are
3 misinterpreting that.

4 CHAIR MUNN: We can be 95 percent
5 confident that the average airborne radon
6 concentration was less than 62 picocuries per
7 liter.

8 MR. CLAWSON: And then there's one
9 right here, concentrations in Building 40, for
10 instance. And, you know, something I really
11 love is the caveats that's in a lot of this
12 because I've just been listening, should not
13 have been, could may have been, you know, and
14 I guess that brings in a little bit, but I'll
15 just continue, "For instance, it's quite
16 unlikely that the average concentration would
17 have exceeded 62 picocuries, 95 percent value
18 of the probable analysis."

19 You know, you're right, Wanda,
20 we'll never have all the information. We're
21 trying to reconstruct everything from many,
22 many years ago. And as you well know and as I

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1 know, I want to make sure that this is as
2 claimant favorable as possible, especially
3 using, in my eyes, as little data as we do
4 have. Now, we can construct data and we can
5 try to put a bounding dose on it and so forth.

6 I just want to make sure that we do the best
7 job that we can for the claimants and that we
8 have done all that we can to, under the
9 information that we actually have, is valid
10 and correct. And I know that we're trying and
11 we've got some wonderful people working on
12 that, and I respect what Jim has said and I
13 respect what SC&A has done. And I just want
14 to make sure that when we vote on this that it
15 is the best that we have and that we have got
16 the information because we're trying to --
17 Larry can attest to this because I was at the
18 first meeting when they talked about how they
19 were going to do this. I have an individual
20 at work that I go into with a problem, and his
21 first question for me is how do you want the
22 outcome? And the reason for that is because

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1 he can make the numbers talk to whatever he
2 wants or what I want to get to the bottom
3 line. And I want to make sure in my mind that
4 we have got everything and that it is credible
5 and that it has covered it.

6 CHAIR MUNN: And, Brad, what do you
7 think the desired outcome is for the people
8 who are sitting around this table?

9 MR. CLAWSON: I don't know. I
10 guess that's what you'll have to look at
11 inside yourself. What I'm looking at is do we
12 feel comfortable with this? And granted I --

13 CHAIR MUNN: Is there a question in
14 your mind that the people sitting around this
15 table do not want the best, most accurate
16 information and calculation that we can get
17 for each one of these claimants?

18 MR. CLAWSON: No, I never said
19 that. I'm just --

20 CHAIR MUNN: I just wanted to make
21 sure you didn't doubt it.

22 MR. CLAWSON: Well, and that's a

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1 good point. Well taken.

2 CHAIR MUNN: Because that's exactly
3 what these people are trying to do. If we
4 didn't care about this then, believe me, as
5 chair of this group, I would not have you back
6 here again for the about fifth time going over
7 these same issues. Every person here wants to
8 see that the best job that can possibly be
9 done is done for these claimants and that the
10 best science that we can get comes out of it
11 because it's really important not only to the
12 clients but to us and to the entire nation,
13 not to mention the nuclear technology as a
14 whole. What we do here matters, and it
15 matters greatly, not just for the claimants.
16 For us to do anything other than the best job
17 we can is shortchanging them, as well as us,
18 and no one here wants to do that. I don't see
19 a single face at this table who would be
20 willing to do that. That's not what we're
21 here to do.

22 So we have to be able to resolve

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1 issues that have minor differences in them
2 based on the much, much improved knowledge of
3 dose reconstruction and of dose measurement
4 and of potential exposure that we know now
5 that we did not know 50 years ago. We've
6 learned an enormous amount about this science
7 in the last 50 years, and we must apply the
8 knowledge that we have now to situations that
9 occurred 50 years ago. That's what we're
10 having to do with Blockson.

11 DR. ROESSLER: I'd like to address
12 Brad's presentation on how he feels this is so
13 uncertain, and I think if you go back, and Bob
14 did a very nice presentation with his
15 equation. And if you look at that equation
16 and understand what goes into it, some of the
17 terms are absolute numbers; there's no
18 question about it. The others that he put
19 into it I think he took the whole bound, the
20 absolute whole bound. There's no question
21 about what those numbers are. So he's gone
22 back and he has shown by going to the source

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1 term and putting in numbers that, you know,
2 are the upper bound that he comes up with
3 something like SC&A has agreed that's in the
4 range that NIOSH does. I think that when
5 you're saying these things are so uncertain
6 that's a real misrepresentation of what's been
7 done.

8 MR. CLAWSON: You see, that's part
9 of the reason why this Board has been locked
10 together the way it has and the different
11 aspects of it is so that we cover everything
12 we do. And I agree. I agree that they have
13 gone into a lot of in-depth study, and I still
14 have a hard time with it. Maybe we never will
15 come to a conclusion that will make me happy.
16 I don't know.

17 MS. PINCHETTI: This is Kathy
18 Pinchetti again, and I just wanted to note
19 that in the August SC&A report, even on the
20 first page where it starts going into the
21 review, it says, "Nevertheless, we found it
22 difficult to conclude that the radon

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1 measurements made in '83 can be considered
2 representative or bounding of the radon
3 concentrations present during the
4 qualification period." So throughout the
5 whole report, it kind of contradicts itself
6 back and forth. You know, it's kind of like
7 thinking out loud, like how is it that Florida
8 information or information, you know, from
9 '83, which was 30 years after the petition
10 date that we're looking at, is even
11 applicable. So I need to agree that there is
12 a lot of question and there's a lot of
13 unanswered things, so we can come up with any
14 sort of data and postulate, well, maybe this
15 and maybe that, but that doesn't make it so.

16 CHAIR MUNN: Well, we have to be
17 aware of the fact that the results that we
18 have here are not all postulated from the 1983
19 data. There's a considerable amount of other
20 information that went into that. It was a
21 single item that they were inferring, as Brad
22 has inferred, has uncertainty involved with

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1 it.

2 MS. PINCHETTI: It looks like the
3 focus is on Building 40, and there's no
4 bioassay information out of Building 40 at
5 all. I mean, we went from Building 55 to
6 Building 40. The only urine analyses were
7 from the guys in Building 55. There's nothing
8 from Building 40.

9 MR. NETON: This is an old
10 question. This is Jim Neton. The Building 55
11 is the covered facility at Blockson Chemical,
12 and there's a parenthetical that says "and
13 other associated activities," which we believe
14 to interpret to mean the addition of the
15 oxidizer in the process to enhance the uranium
16 recovery and a few other issues like that, a
17 few other pieces like that. But by and large,
18 Building 40 where, you know, that process was
19 there before, during, and after the AEC
20 commissioned Blockson to pull off uranium
21 product. Those are part and parcel to the
22 fact that they're there, whether or not the

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1 agency ever commissioned Blockson to make the
2 uranium or not.

3 It's the radon that we're worried
4 about because that was where the oxidizer was
5 added and a person could have been exposed to
6 radon. You raise a good point that right now
7 we are assigning concomitant exposure to
8 Building 55 to the person who was drumming the
9 uranium and all this radon on top of it. I
10 mean, that's somewhat claimant favorable from
11 that perspective because the radon value that
12 we're calculating are the maximum values that
13 would have occurred in Building 40. In fact,
14 Building 55 was removed from those prophecies
15 and there was no real radium source term in
16 Building 55. So, in fact, the levels that the
17 operators at Building 55 experienced would be
18 substantially lower than any value that we're
19 calculating here, in my opinion.

20 CHAIR MUNN: So we are at a point
21 where the bounding value that is expressed by
22 NIOSH is within the bounding value that the

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1 contractor agreed would, in fact, cover all
2 cases from the Blockson site. Is it the
3 appropriate value? That's the question we
4 started with. It's the question we still have
5 before us. It's the question that we have to
6 report back to the Board.

7 DR. MELIUS: Which is the
8 appropriate value? The NIOSH value or the --
9 I mean, one's a range and the other is a
10 value, I guess.

11 CHAIR MUNN: Yes. And the question
12 is are we using the range, or are we using the
13 defined value?

14 MR. ELLIOTT: We're using a defined
15 value, and I think that's what the Board is
16 charged with looking at. That's being
17 reviewed here --

18 CHAIR MUNN: That was my
19 interpretation --

20 MR. ELLIOTT: -- to have another
21 point of comparison in the modeling range
22 that's been provided. The question goes to is

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1 the NIOSH value an appropriate value?

2 MR. NETON: I'd certainly be
3 interested in hearing the opinion of the
4 working group as to whether or not they feel
5 that the SC&A value range is more appropriate
6 and why. I'd be interested in discussing
7 that.

8 DR. ROESSLER: Let me ask a
9 question. Let's assume that we said, okay,
10 the SC&A value is the appropriate value.
11 Let's say we agreed on that. If we did that,
12 would that then close the issue for some of
13 our workgroup members?

14 MR. ELLIOTT: What value? 62
15 picocuries or --

16 DR. ROESSLER: Well, let's just say
17 --

18 MR. ELLIOTT: Well, I think you
19 have to specify the value because it could be
20 our value.

21 DR. ROESSLER: Yes. Okay. Let me
22 just say if we said, and I don't agree with

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1 it, but let's just say that we picked 62.2 or
2 whatever the number is, would that then answer
3 the questions for our other workgroup members?

4 We still get back to the question of do you
5 think we can bound?

6 DR. MELIUS: Can we come up with a
7 plausible bound.

8 DR. ROESSLER: Yes, yes.

9 DR. MELIUS: Which is where I think
10 Larry is coming from; is that correct?

11 MR. ELLIOTT: Well, we feel --

12 DR. MELIUS: The plausible bound is
13 2.33.

14 MR. ELLIOTT: Yes, we feel that
15 that has been proven in the modeling effort
16 that SC&A has done. And if you would remove
17 those extreme points of range in the two
18 variables it's even going to tighten it down
19 toward where we're at. I mean, out of a
20 thousand runs in the Monte Carlo simulation
21 run, they had a high 100,000, they had run
22 high extreme value of 560 something --

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1 DR. ANIGSTEIN: Six hundred.

2 MR. ELLIOTT: Six hundred; I'm
3 sorry. And if you take that one out, it's
4 certainly going to draw it down.

5 CHAIR MUNN: Take the nothing out.

6 MR. ELLIOTT: Take the nothing out.

7 MR. NETON: I personally think if
8 you take 62 it gets into the realm of
9 implausibility as a fixed value, as a constant
10 for all workers. Although, I would suggest
11 that the Board, if the working group was
12 willing to entertain this distribution, I
13 mean, it's possible to entertain distribution
14 and look at the, you know, is their number,
15 seven picocuries per liter, the 50th
16 percentile? And the upper bound would be, you
17 know -- implausible, but if it's got some
18 credibility, the 62 could have been there at
19 some time, there's some credibility it could
20 have been as low as whatever the 5th
21 percentile was, so you end up with this
22 triangular distribution of values that

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1 essentially the SC&A model would predict. If
2 we were going to use any model at all, it
3 would not be a fixed upper 95th percentile
4 using the --

5 MR. ELLIOTT: Extreme range.

6 MR. NETON: -- extreme ranges
7 because then you end up way out of there. In
8 my mind, it becomes implausible when you
9 compare it to other facilities, like
10 Mallinckrodt and such.

11 DR. ROESSLER: And then we're not
12 consistent.

13 MR. NETON: Right. But if one
14 starts to talk about distributions and a
15 central value, which maybe, you know, it's
16 seven under the current constraints of their
17 model, that's a debatable issue. But the
18 Board, the working group has to come to grips,
19 I think, with is this approach even valid?
20 I'm hearing discomfort that that approach is
21 not even an a tenable upward bound for any of
22 this. And if that's true, then we may as well

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1 --

2 MR. ELLIOTT: You're at
3 loggerheads.

4 MR. NETON: There's nothing to do.
5 We're at a stalemate.

6 DR. ROESSLER: I think a couple of
7 the workgroup members are not accepting the
8 SC&A report. I don't think there's any
9 consistency in it really in their wording, and
10 I think that we need to hear from you do you
11 accept the report or not? Maybe that's where
12 we start our discussion.

13 DR. MELIUS: Accept the report for
14 what? As an upward bound, as a plausible
15 upward bound --

16 DR. ROESSLER: But do you accept
17 that much?

18 DR. MELIUS: -- or as a piece of
19 information? The answer is no as a plausible
20 upward bound. Do I accept it as a modeling
21 information that's useful in trying to
22 understand what exposures might have been at

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1 Blockson in that building? Yes. It's a
2 useful piece of information, just as the
3 information from Florida may be or from
4 Pocatello, wherever.

5 DR. ROESSLER: I'm not sure --

6 DR. MELIUS: Is it adequate to do
7 or sufficient for dose reconstruction
8 purposes? I'm not sure.

9 DR. ROESSLER: So we're at
10 loggerheads regardless. I think, you know, we
11 might as well get to the point. You haven't
12 given us anything to really focus on that we
13 can do because no matter what we do I think
14 you're still at loggerheads. Is that the
15 bottom line?

16 DR. MELIUS: It may be, but I think
17 Jim has given us some new information, Jim
18 Neton, today, which we'll look at, which I'll
19 look at, and we've heard more from SC&A. I
20 understand what they did better now, which I
21 couldn't understand from the transcripts.

22 CHAIR MUNN: So are we going to

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1 have an opportunity to -- if we take a longer
2 than one-hour lunch break, is that an adequate
3 amount of time for any additional absorption
4 of information here, or is it not? The real
5 question being can we resolve any of this
6 today on this specific issue? Can any one
7 begin to feel that if 2.33 is not the right
8 value is some 50 percent figure a right value?

9 Is there any possibility that today we can
10 address this question and come to any further
11 point of agreement than we have right now?

12 DR. MELIUS: The answer to that is
13 no on the bigger question. If others would
14 find it useful for NIOSH and SC&A to try to
15 agree on a more reasonable or what NIOSH would
16 feel would be more reasonable parameters for
17 the model and what the information from that
18 model would be useful in some way, I have no
19 objections to that.

20 CHAIR MUNN: What do you feel would
21 be more reasonable?

22 DR. MELIUS: Nothing. I don't have

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1 any feelings about reasonable.

2 CHAIR MUNN: Rather than proceed
3 with this issue right now, I would suggest
4 that we take a ten-minute break and come back
5 for about 45 minutes after that before we go
6 to lunch and move on to the other items that
7 are on our list. If we can address any one of
8 those and at least remove those items from the
9 list, that would be helpful. For the moment,
10 we are setting aside focusing on the radon
11 issue. We will get back to it after lunch.
12 For the moment, let's take a comfort break and
13 be back in no more than 15 minutes, preferably
14 ten if we're all back.

15 (Whereupon, the foregoing matter
16 went off the record at 11:28 a.m.
17 and resumed at 11:42 a.m.)

18 MR. KATZ: We can go, and I don't
19 think I need to make any comments in advance.

20 CHAIR MUNN: No, I don't think so.

21 MR. KATZ: Restart.

22 CHAIR MUNN: We're back in session

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1 here, and we're going to move down our list of
2 issues that the full Board had asked us to
3 address, the next one being revisiting the
4 suitability of surrogate data use. There had
5 been some expressions of concern with regard
6 to the use of data from anywhere else. I'm
7 not sure who to ask to address that to begin
8 with. If there's some specificity to those
9 concerned, this might be a good time to hear
10 those. Jim, Brad, do either of you have
11 specifics relative to surrogate data use that
12 you wanted to reiterate for us to use as a
13 starting point for the discussion?

14 DR. MELIUS: I mean, I think we've
15 been, before we've been talking about using
16 surrogate data, using the Florida phosphate
17 data, and I think that's what we're talking
18 about, is that appropriate or not. And I
19 think we said earlier the justifications for
20 that are, one, the SC&A model, and number two
21 is the limited data from Blockson and then the
22 data from the other sites that Jim has talked

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1 about and presented in that table. I don't
2 think at this point there's anything further
3 that can be said about that.

4 CHAIR MUNN: Jim, do you have any -
5 -

6 MR. NETON: I was just prepared to
7 say a few comments about how this fares in
8 light of the IG-004, which is NIOSH's document
9 on the issue of surrogate data. I think the
10 approach that we've adopted fulfills the
11 guideline that they've been written in there,
12 which is that we need to know something about
13 the source term. We have a lot of information
14 about the source term that Bob has used in his
15 calculations. If we're going to have _____
16 facilities with similar processes, these are
17 all wet phosphate facilities, a couple from
18 the north, the south admittedly. So it's a
19 similar chemical process.

20 The only thing that right now is
21 clear cut in our mind but the temporal
22 considerations have to be considered, and we

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1 fully admit that there is a disconnect between
2 the earliest data in 1976 and the data that
3 we're trying to reconstruct in the 50s. But
4 we believe that the factor of five
5 conservatism built into that value more than
6 makes up for the differences in the
7 ventilation rate during that time period. So
8 at this point --

9 MR. ELLIOTT: It's not necessarily
10 a disconnect. We've just not shown a
11 connection to the '76 data and the 1950 era
12 circumstances.

13 MR. NETON: Well, the disconnect in
14 my mind is that we don't have measurements
15 other than at Blockson in 1950. I mean, it
16 would be nice if we had 1950 measurements at
17 all these other facilities, and we don't, you
18 know, with similar ventilation rates. But we
19 have a measurement in 1950 or in 1983 that we
20 can go back and use scale based on the
21 plausible ranges in ventilation rates. And
22 couple that with the fact that we believe the

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1 estimated model has clearly shown that our
2 value was in the realm of possibility. It's
3 not a 1 percentile or 0.1 percentile. It's in
4 the mix, especially if you re-analyze the
5 range of values that we use in that model. I
6 was prepared, so I threw it out there.

7 DR. MELIUS: I want to attack you
8 on the if we change the model, it will be
9 fine.

10 CHAIR MUNN: Jim, I wanted to ask
11 you --

12 DR. MELIUS: Who refined -- I'm
13 sorry. Go ahead.

14 CHAIR MUNN: No, I'm sorry. I
15 didn't mean to interrupt you.

16 DR. MELIUS: No, no, go ahead.

17 CHAIR MUNN: In view of the fact
18 that you and _____ have been putting together
19 some thoughts with respect to guidelines in
20 this regard, is what's transpiring here going
21 to fit reasonably with -- we know those
22 haven't gone before the Board yet. They're

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1 not approved, but you've been working on them
2 and we have material to deal with. Do you see
3 any major conflict in what you've been doing
4 with surrogate data issue and what we have
5 here at Blockson?

6 DR. MELIUS: I think the issues are
7 the same as what Jim brought up. I don't
8 think that the draft guidelines, I think it's
9 too early to say whether they support or don't
10 support this approach. I think it's an issue
11 of application.

12 CHAIR MUNN: But you don't see any
13 glaring difference between what's being
14 proposed and what we --

15 DR. MELIUS: I think that the, to
16 say this correctly, that the parameters Jim
17 talks about, temporal time period, nature of
18 the data, how robust the data is, I don't
19 think are different. What the conclusion
20 would be are how those are applied, I think.
21 We just don't know yet. I don't want to
22 speculate --

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1 CHAIR MUNN: No, understand.

2 DR. MELIUS: -- one way or the
3 other.

4 CHAIR MUNN: I wouldn't want you
5 to. I just wanted to make sure there was no,
6 in your mind, any obvious difference between
7 this approach, the items that have been under
8 consideration --

9 DR. MELIUS: I don't think there's
10 any other factor that's being considered.

11 CHAIR MUNN: That's really --

12 DR. MELIUS: Fair?

13 CHAIR MUNN: -- the real question.
14 Good. Glad to hear that. So far as we know
15 now, the surrogate data used suitability is
16 something we're going to revisit when we go
17 back and talk about the radon issue, right?

18 DR. MELIUS: Correct.

19 CHAIR MUNN: All right. Provide
20 specifics of the coworker model for uranium
21 exposure. That's a part of the information
22 that was just sent to us last week to take

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1 another look at. Jim?

2 MR. NETON: Actually, it was SC&A
3 that had been tasked with generating this
4 evaluation of our coworker model, and I
5 believe John Mauro sent an e-mail that
6 summarized that opinion on that model. I'm
7 sure if John were here he would be happy to
8 talk about it. But by and large, my take on
9 what he wrote was that we use the generated
10 95th percentile distribution of chronic
11 exposures for the monitor of workers at the
12 facility and we generate distribution of
13 chronic exposure models for all the workers
14 that were monitored, the 10 or 12, I forget.
15 Tom could probably fill this in better. And
16 we pick the 95th percentile of the
17 distribution of chronic exposure models,
18 which, in fact, is higher than the highest
19 exposed person by a smidge, not a lot, but
20 it's about 75.

21 DR. ANIGSTEIN: I think 82 versus
22 about 75.

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1 MR. NETON: Right, yes. So my
2 sense from John's e-mail, and maybe Bob could
3 comment, is that SC&A, at least to my
4 knowledge, has no real argument with the way
5 we reconstructed internal dosage at Blockson
6 Chemical.

7 DR. ANIGSTEIN: Yes.

8 CHAIR MUNN: You want to weigh in
9 on that, Bob?

10 DR. ANIGSTEIN: Yes, I want to
11 weigh in. No, we agree and also answer, Dr.
12 Melius asked the question about did we
13 inventory, I saw the e-mail, basically did we
14 independently try to verify the dosage based
15 on urinalysis, and we did it in a reverse
16 manner, and that is John Mauro took the 82
17 picocuries per day and says, well, _____ the
18 chronic long-term exposure of a worker that he
19 always had 82 picocuries per day, what would
20 his urine be? And assuming, here's the
21 caveat, assuming the type-M where we do have
22 some question about, but if, hypothetically,

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1 we were to agree with this type-M designation,
2 then it turns out that the urine of that 82
3 picocuries per day worker, if I remember
4 correctly, would be something like 0.008
5 picocuries per liter, which is higher than the
6 highest thousand that was actually measured.
7 So that was one thing.

8 So, yes, we believe that the
9 derived values are consistent with the
10 urinalysis provided. However, we leave in
11 abeyance the issue of whether it is all M or
12 whether some could be type-S. If some of it
13 is type-S, it would change the picture
14 significantly.

15 MR. NETON: But I think that if the
16 model values themselves, that's part of the
17 question, at least in my opinion Dr. Melius
18 trying to get at, this had more to do with if
19 you have sampling on the right worker. Is
20 there a population out there that were not
21 monitored that could have been higher than the
22 population that we've modeled? I think --

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1 DR. MELIUS: That's one question.

2 MR. NETON: That's one question.

3 And Tom Tomes has put together this little
4 table that we just passed around, which I
5 think is somewhat instructive. If you'll
6 notice, there are ten different sampling dates
7 on the top column here. Those are the dates
8 at which samples were collected on workers and
9 sent to the HASL Laboratory, now Environmental
10 Measurements Laboratory, for analysis, and you
11 see an interesting pattern here that there are
12 anywhere from ten or so workers that were
13 sampled during every one of these monitoring
14 periods. Now, why is that important? Well,
15 we've been told by workers that there were
16 about ten people working on the project, no
17 more than 20 but 10 or 12 workers that worked
18 in Building 55.

19 MR. TOMES: Well, different shifts.

20 Yes, total.

21 MR. NETON: A total of 10 or 12,
22 and so what you see here is a pattern of,

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1 well, as one worker dropped off and maybe went
2 somewhere else, they added some additional
3 workers. So there's a nice clear pattern
4 here, established pattern, of monitoring what
5 we believe to be the workers in Building 55.
6 If not all of them, certainly almost all of
7 them. There may have been some ancillary
8 maintenance staff and such that entered the
9 building that were not sampled here, but we
10 believe that these samples cover the people
11 who were involved in the drumming of the
12 uranium material itself. They were actually
13 involved in the physical process of working,
14 handling the materials.

15 So in our opinion, we've captured
16 the right population to model. And, in fact,
17 by taking, what Tom has done is developed a
18 chronic exposure model for each of the
19 workers. In other words, he has consistent
20 samples throughout a long period of time and
21 took each of those chronic exposures that he
22 developed and then picked the 95th percentile

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1 of all those chronic exposures on those
2 workers. So in my opinion and in OCAS'
3 opinion, this was the appropriate way to do
4 the analysis. I've had some discussions in
5 the past with John Mauro on this, and I think
6 he's in agreement that this is an appropriate
7 manner to handle these data.

8 CHAIR MUNN: Tom, do you have
9 anything to add?

10 MR. TOMES: That pretty much
11 describes what we did.

12 CHAIR MUNN: So the specifics of
13 the coworker model for uranium exposure are on
14 the table for discussion. Does anyone find
15 them inadequate, inaccurate? And where are we
16 with the type-M question?

17 MR. NETON: I can answer the type-M
18 question. That was decided to be a site
19 profile issue many, many, many months ago.

20 DR. MELIUS: I had another
21 question. There's one worker who had
22 consistently high values, and I was curious

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1 about if we knew anything about that person's
2 job assignment.

3 DR. ANIGSTEIN: We looked into that
4 interpretive and some of the other
5 information, and, no, there were only job
6 assignments for five of those 25 workers, and
7 none of those were at the high end.

8 MR. NETON: Well, I think we have
9 some claimant data that might supplement that;
10 I don't know.

11 DR. ANIGSTEIN: Okay.

12 MR. TOMES: I am not sure exactly
13 which worker that you're referring to that had
14 higher results, but we do have data on one
15 person who was not the highest person, but who
16 was near that at the upper end who actually
17 drummed material. The highest coworker, I do
18 not have any data on that.

19 MR. NETON: But that one is a
20 claimant, right, Tom? It's a case that we
21 have for reconstruction.

22 MR. TOMES: Well, one of them is,

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1 and then there's another one. One of those
2 persons is, yes. Then there was another one
3 who was identified in a worker meeting and
4 what his job is. He was also near the upper
5 end of that distribution, and both those
6 workers handled the ground material at some
7 point in time in Building 55 on a routine
8 basis.

9 DR. MELIUS: I don't want to ask
10 too many more questions because of privacy --
11 oh, you're in the room?

12 CHAIR MUNN: Well, yes. I just
13 wanted to make sure that your question was
14 specifically addressed because you had asked
15 about the highest one.

16 DR. MELIUS: I believe he did.

17 CHAIR MUNN: You think he did that?
18 Okay, okay. I didn't want to --

19 DR. MELIUS: And I'd seen the
20 calculation that was referred to in the last
21 meeting, and I understand that. And I
22 actually think this is a very helpful way of

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1 portraying it. I think it's useful, so thank
2 you.

3 CHAIR MUNN: Do we feel that
4 there's anything other, any other topic that
5 needs to be covered with respect to the
6 specifics of the coworker model for the
7 uranium? Everyone is accepting what we have
8 here as being adequate and appropriate.

9 Next issue was a concern that we've
10 also heard expressed in many sites with
11 respect to what assumptions are used for
12 maintenance workers.

13 MR. NETON: Tom, I think --

14 MR. TOMES: I believe I can answer
15 that. Our site profile, given the intake that
16 we've assigned -- and also the doses are
17 similar, we assumed that they were exposed at
18 that high level.

19 CHAIR MUNN: Acceptable response?

20 MR. CLAWSON: You've got the --
21 what's the high level?

22 MR. TOMES: The intake rate is two

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1 picocuries per day.

2 MR. NETON: We make no
3 differentiation between a maintenance worker
4 and a -- we don't know most of the time where
5 these workers were or even if you have
6 identified a person who claims they were a
7 maintenance worker at a certain point may have
8 been a chemical operator another period of
9 time, but we don't know. So all workers that
10 could have worked in the plant are given the
11 same exposure, one size fits all.

12 CHAIR MUNN: We've had many
13 expressions from the workers about the
14 flexibility of their job descriptions and how
15 they changed from one to the other over short
16 periods of time and over long periods of time.

17 MR. NETON: This is not
18 inconsistent with what we've done at other
19 sites where we would select the 95th
20 percentile of the unmonitored worker who could
21 have been working in the plant. We received a
22 95th percentile for coworker modeling. It's

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1 very similar to what we've done elsewhere.

2 CHAIR MUNN: Any problem with that
3 response? Acceptable? The final item on the
4 list was concern with respect to data quality.

5 I'm not sure exactly what can be said about
6 that or what reassurance people can be given,
7 but since it was presented as a showstopper at
8 the Board meeting it would behoove us to try
9 to address it here in such a way that we can
10 reassure the Board that it has been adequately
11 covered and that we've given new consideration
12 to their concern. Does anyone want to speak
13 with respect to data quality and what the
14 concern of the Board was?

15 DR. MELIUS: I don't recall that.

16 MR. NETON: I don't recall what the
17 issue was, to be honest with you.

18 DR. MELIUS: I mean, I raised the
19 issue about the uranium sampling earlier that
20 John Mauro may have misunderstood, so SC&A did
21 a report on sort of laboratory quality issues
22 and so forth, which really wasn't -- the issue

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1 I was raising was more about this job title,
2 who was, you know, monitoring sample kind of
3 thing. So I don't think there was ever a
4 question about that. I'm just trying to
5 remember back to the Board meeting and what we
6 said.

7 MR. NETON: Yes. I think Dr.
8 Melius is right. The data analysis was done
9 by the Health and Safety Laboratory, which
10 we've accepted as sort of a de facto quality
11 laboratory for other sites. So I don't think
12 there's any question related to -- unless this
13 refers to the radon data, which we have almost
14 none, so I guess that's --

15 DR. MELIUS: Yes. I mean, I think
16 there was an issue about the radon, the
17 methodology and so forth for the radon data
18 collected at Blockson.

19 MR. NETON: Yes.

20 DR. MELIUS: And I don't remember
21 how that was addressed. I remember it being
22 raised.

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1 MR. PHILLIPS: This is Chick
2 Phillips. You did address that in your
3 earlier report, the draft report, white paper,
4 on the radon measurements at Blockson.

5 DR. MELIUS: Okay.

6 MR. PHILLIPS: How it got
7 incorporated in this last one I'm trying to
8 remember.

9 MR. NETON: I think it is in there,
10 Chick.

11 MR. PHILLIPS: Okay.

12 CHAIR MUNN: Do we need to
13 resurrect that white paper, or are we content
14 with where we are relative to data quality?

15 MR. NETON: You know, I thought
16 that, I agree with Dr. Melius. I thought it
17 was more related to the quality of the
18 samplings of the distribution of employees or
19 something to that effect. That was my --

20 DR. MELIUS: That was the issue
21 that I had raised earlier. And as I said,
22 John misunderstood me and sort of went back to

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1 sort of laboratory quality issues. There was
2 one report on that. But then the only other
3 issue I remember coming up about, sort of,
4 data quality was more sort of methodology and
5 so forth with those radon samples. That may
6 have just been when they were first presented
7 no one knew where -- I don't recall.

8 DR. MELIUS: I think it was.

9 CHAIR MUNN: If that's the case,
10 then we're still talking radon, and we'll just
11 address that when we get back from lunch.

12 DR. MELIUS: There's a June 5th
13 draft report from Chick Phillips. I have
14 additional information on radon exposures at
15 Blockson, radon measurement in Building 40,
16 and it's 1983, which summarizes, I guess, data
17 Chick took from the Olin report or --

18 MR. NETON: Correct, yes. That has
19 been incorporated into the current August
20 report on pages 9, 10, and 11.

21 CHAIR MUNN: Good.

22 MR. NETON: It's essentially the

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1 analysis of the one sample that Chick went
2 back and re-resurrected what that really meant
3 in terms of working levels, and there's a nice
4 table in there. I think that's in there.

5 CHAIR MUNN: So can we truthfully
6 say that the workgroup has looked at that
7 particular bullet and do not find it to be a
8 cause for concern?

9 MR. CLAWSON: I'm just trying to go
10 back in my short memory. Do we know who did
11 the bioassays?

12 MR. NETON: The Health and Safety
13 Laboratory.

14 MR. CLAWSON: Health and Safety.

15 CHAIR MUNN: And I think that may
16 have been one of the things that was troubling
17 someone.

18 MR. CLAWSON: Well, if you
19 remember, it's right after some information
20 came out about one of the people that had done
21 a lot of the bioassay programs had a problem.

22 CHAIR MUNN: Apparently not. That

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1 is the last of the issues that I have. It
2 appears that the only outstanding thing that
3 we have, correct me if I'm wrong, our issue
4 with respect to radon distribution is our big
5 outstanding concern here, the one we're going
6 to take a little extra time over our lunch
7 hour to think about. We'll come back here.
8 It's now, by my watch, 10 minutes after 12.
9 We will come back here at 1:30 and we will
10 address this one more time and see if we can
11 come to a conclusion on what any path forward
12 might be, if there is, in fact, a path
13 forward. So we are adjourned until 1:30
14 Eastern time. We'll be back online then.

15 MR. KATZ: Thank you, everybody on
16 the phone.

17 (Whereupon, the above-
18 entitled matter went
19 off the record at 12:08
20 p.m. and resumed at 1:30
21 p.m.)

22 CHAIR MUNN: Thank you all. We've

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1 taken a longer than usual lunch with,
2 hopefully, an opportunity to think a little
3 bit about one outstanding issue that we have
4 left. Of those that were pointed out to us by
5 the Board that they wanted us to continue some
6 concerns with, the only one still outstanding
7 is the initial focus on the radon issue and
8 whether or not the bounding value can be
9 determined to the agreement of all the major
10 parties involved. We have some additional
11 information and have had a considerable amount
12 of discussion here about it and seem to be at
13 a junction where we either have to take some
14 other path than what we've taken or we have to
15 throw up our hands, and I'm not quite willing
16 to throw up our hands yet.

17 We have agreed that the
18 distribution that has been presented by the
19 contractor is a reasonable statistical
20 distribution, and now the primary concern that
21 we have is how to narrow that to an
22 appropriate value that can be accepted as

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1 being reasonable. If anyone has any
2 suggestion with respect to how to proceed, I
3 would like to see one more effort for SC&A and
4 NIOSH technical folks to sit down and see if
5 the range of distribution that has been
6 suggested can be discussed and can be agreed
7 to be narrowed to the point where we can bring
8 a new suggestion back to the Board and to our
9 other working group members.

10 Does anyone have any suggestion
11 with how to proceed with that possibility?

12 MR. KATZ: Before we go on, just
13 let me, as a matter of record, I should have
14 noted that Dr. Melius is not attending at this
15 point.

16 CHAIR MUNN: That's correct. Dr.
17 Melius has left us over the lunch hour. We're
18 sorry about that, but we'll continue on.

19 MR. PHILLIPS: Wanda, this is
20 Chick.

21 CHAIR MUNN: Yes, Chick?

22 MR. PHILLIPS: I was going to throw

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1 something out before I got sent off on the
2 telephone. I don't know if this will help
3 direct the issue or confuse it even more, but
4 let me take a shot at it. We did have, as I
5 said before and as is pointed out in the table
6 that NIOSH provided, actually three
7 managements that have reasonable belief that
8 those were made in Building 40, the building
9 in question.

10 MR. KATZ: Chick, are you speaking
11 through the speaker phone, because actually,
12 your voice is not very clear at all?

13 MR. PHILLIPS: Okay, let me try
14 something real quick. Is that much better?

15 (Chorus of much better)

16 Okay. We did have a management,
17 actually three managements, one that gave us a
18 positive value in Building 40. I'm going to
19 be referring here to the August SC&A report,
20 if everybody has that before them, the August
21 12th --

22 CHAIR MUNN: Yes, we do.

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1 MR. PHILLIPS: -- Blockson analysis
2 revised draft.

3 CHAIR MUNN: That's what we've been
4 working from.

5 MR. PHILLIPS: Okay, all right.
6 And we went through the steps to determine the
7 working level value and radon value for that,
8 which appears to be made in the 40 filtration
9 area, which is close to the digester area.
10 And that comes out to be a little less than,
11 and let's just say it's one picocurie per
12 liter. The question is -- this measurement
13 was made in 1983. What conditions changed in
14 Building 40 or potentially changed in Building
15 40 between the covered period in the 60s and
16 the measurement that was made in 1983?

17 CHAIR MUNN: You may recall we
18 pursued that at some length.

19 MR. PHILLIPS: We did. And, in
20 fact, we went back and did some additional,
21 we, with NIOSH, went back and did some
22 additional worker interviews to try to

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1 determine what changes could have been made,
2 particularly in the ventilation rate. Because
3 if you look at table four in the report that I
4 referred to and you look at the values that
5 affect the radon concentration in the
6 building, to the best of our knowledge the
7 process did not change between the two periods
8 that we're talking about, between the 60s and
9 `83.

10 CHAIR MUNN: We were repeatedly
11 assured by the workers that the process did
12 not change.

13 MR. PHILLIPS: That's correct. The
14 one thing that could have changed and, in
15 fact, one of the workers that we interviewed
16 indicated that he thought ventilation had been
17 added above the digester tanks. And the one
18 value in here, then, that could have changed,
19 if you look at all of it, assuming that the
20 process itself did not change significantly,
21 that could have affected the value is really
22 the ventilation rate.

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1 So going back and looking at that,
2 if, indeed, the value was one picocurie per
3 liter at the time the measurement was made, it
4 could be ventilation rate had changed by a
5 factor of two to reach the bounding value as
6 originally proposed by NIOSH, the 2.33. And
7 one would say, yes, that that's certainly a
8 possibility.

9 Moving down to table five, which is
10 the percentile table coming from our Monte
11 Carlo analysis, look at the 50 percent value,
12 the ventilation rate would have had to change
13 by a factor of seven to reach it. Is that
14 reasonable? Possibly. To reach the 95
15 percentile value, it would have had to have
16 changed by a factor of 60. Is that
17 reasonable?

18 So I don't know if this narrows the
19 scope. Again, we have no reason to discount
20 those values that were measured in 1983.

21 CHAIR MUNN: Some thought that that
22 narrowed the scope. We have one member of our

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1 working group who's not with us today who was
2 very concerned over the ventilation issue and
3 expressed great concern over what the size of
4 the fan or fans might have been, what its
5 rotational speed was, et cetera. And, of
6 course, we don't have access to any of that
7 information at all. We only know that a fan
8 was installed but that it did not noticeably
9 affect the amount of particulate and other
10 residue that was in the building where the
11 people were working. They indicated, if I
12 remember correctly, that there was some
13 improvement. They noticed an improvement, but
14 it wasn't an enormous improvement.

15 So I appreciate your suggestion. I
16 think it can certainly be taken into
17 consideration and mentioned again when we
18 present this to the Board and would be perhaps
19 helpful if I had some, just thoughts and notes
20 on what you just recorded, for our transcript
21 here, for my own purposes. I'd like to be
22 able to incorporate those same kinds of

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1 thoughts in any presentation that I make to
2 the Board next time.

3 But in the meantime, we're faced
4 with this very real question regarding the
5 radon concentration and that, of course, being
6 a factor that will obviously become a part of
7 what we'll be doing here. Perhaps we can get
8 some thoughts from our NIOSH colleagues. Jim?

9 MR. NETON: Yes, Wanda, this is
10 Jim. I think we're more than willing to sit
11 down, if it's the working group's desire, with
12 SC&A to discuss on a detailed technical level
13 the parameters associated with the model they
14 developed and have a free exchange of our
15 ideas as to what we believe to be bounding and
16 not bounding and that sort of thing. And we'd
17 be more than happy to sit down and do that and
18 possibly bring in some of the discussion
19 points that Chick just raised. You know, I'm
20 a firm believer in looking at the real data
21 that we have and see that that sort of rang
22 true, and we have not had that opportunity

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1 yet. We've had an exchange here at the
2 working group level, but maybe that a more in-
3 the-weeds, technical discussion might be in
4 order for us to sort of iron out our
5 differences.

6 CHAIR MUNN: Bob, are you and Chick
7 going to be able to commit to doing that to
8 some degree in the immediate future? Will you
9 be able to work with your NIOSH counterparts
10 to review this again?

11 DR. ANIGSTEIN: Sure.

12 CHAIR MUNN: Chick?

13 MR. PHILLIPS: Sure. I think
14 that's a good suggestion.

15 MR. CLAWSON: I would kind of like
16 to, you know, I guess a lot of, maybe, my
17 concerns may be addressed. I'd like to be
18 able to have the ability to be able to listen
19 to that because maybe that will give me the
20 satisfaction that I need or whatever like that
21 because, you know, airflow, to me, that's how
22 we control it at where I work. That's how we

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1 control it is airflow. So it is an issue, and
2 I'd just like to be a part of it.

3 MR. NETON: I think the way these
4 technical calls usually work is that we post
5 the time that's available for SC&A and NIOSH
6 to convene, but we also would invite any
7 working group member to participate more than
8 likely be a phone teleconference, to listen in
9 and participate.

10 DR. ROESSLER: So we actually can
11 participate and not just listen in?

12 MR. NETON: Yes, yes. I think the
13 main idea, though, is it would be SC&A and
14 NIOSH getting down into some real detailed
15 technical discussions, but if the working
16 group had any issues to bring to the table
17 they could certainly participate. And then
18 typically what happens is there wouldn't be a
19 transcription of that discussion made, but
20 there would be a detailed minutes of that
21 discussion and any outcomes that resulted from
22 that meeting.

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1 DR. ROESSLER: I think what you're
2 proposing is you look at the model, which I
3 think of as the equation that Bob presented
4 this morning, you look at certain things of
5 which there's been maybe not the kind of data
6 that we need to satisfy people who question
7 it. So one of them would be the, let me look
8 at this, the exchange rate of air, and the
9 other one I would recommend really looking at
10 and I believe there must be something on it is
11 that release fraction. There has to be better
12 information than zero to one.

13 MR. NETON: There's not a lot out
14 there, but I'm a firm believer, again, in
15 taking the data that we have for contemporary
16 monitoring and seeing, sort of, a sanity check
17 on the release fraction. I know Bob doesn't
18 necessarily buy that.

19 DR. ANIGSTEIN: It would take, I
20 mean, I'm referring to what Gen said, this is,
21 again, an idea off the top of my head. This
22 would be a very dandy experiment for some --

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1 DR. ROESSLER: That's what I'm
2 thinking.

3 DR. ANIGSTEIN: -- in the
4 laboratory. Throw in some powdered --

5 DR. ROESSLER: Or two academics.

6 DR. ANIGSTEIN: To throw in some
7 powdered phosphate. It doesn't have to be the
8 size of that, you know, just a small --

9 DR. ROESSLER: Maybe somebody has
10 done it already.

11 DR. ANIGSTEIN: I can't imagine
12 why. I just can't imagine why anyone would.

13 MR. NETON: Well, there are some
14 similar experiments that were done. I mean, I
15 did manage to find a couple of similar
16 experiments about release like this. It
17 wasn't exactly sulfuric acid, though. But we
18 can dig in a little bit more. I mean, I have
19 not spent a tremendous amount of time
20 critically evaluating this model. I think if
21 we spent a little more time and maybe
22 consulted a few experts that I have in mind

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1 that I have not spoken with yet to get some
2 other opinions and then convene with SC&A and
3 throw all those ideas on the table and, you
4 know, let it take us where it takes us. I
5 mean, it may be at the end of the day that
6 there is more uncertainty than we've
7 acknowledged, and then it needs to move a
8 little bit. But I think I'd rather have a
9 technical discussion before we make that
10 decision.

11 DR. ANIGSTEIN: Yes. I mean,
12 again, if there was, I would say, for
13 instance, the Florida State, William Burnett's
14 group, that something, they had done it in
15 water, so it shouldn't be that hard for them
16 to do it -- but they do it equilibrium. They
17 said they were going to give it six weeks, so
18 we know with equilibrium it's going to come
19 out. The question is, this is not a question
20 of the equilibrium, something that chemists
21 can, you know, know how to do. Kinetics is
22 something much harder.

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1 CHAIR MUNN: An entirely different
2 thing.

3 DR. ANIGSTEIN: Yes.

4 CHAIR MUNN: Can we then agree that
5 NIOSH and SC&A will set up --

6 MR. KATZ: Well, I just wanted to
7 clarify just a question for Brad. I just
8 wanted to understand, I mean, Brad, are you
9 saying that, given that they go through this
10 work with you on the phone, does this have the
11 potential to resolve --

12 MR. CLAWSON: Yes, it does.
13 There's just a lot of questions.

14 MR. KATZ: Okay. Just to be clear.

15 MR. CLAWSON: Maybe I'm looking too
16 simplistic or whatever like that, but there's
17 a lot of things that don't come out in this
18 paper that may address what I've been
19 concerned, so forth like that. That's why
20 it's beneficial for me to be able to listen to
21 these because maybe some of the unanswered
22 questions I have, questions have been

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1 addressed already.

2 CHAIR MUNN: I found it enormously
3 valuable in the past, even not --

4 MR. CLAWSON: So have I. I --

5 CHAIR MUNN: -- not being involved
6 at all, just listening. It's been very
7 helpful to hear the technical discussions that
8 go on leading up to the presentation that we
9 worked with. So --

10 MR. ELLIOTT: I applaud your
11 dedication and your interest, Brad, and your
12 open-mindedness to enter into this kind of a
13 technical give and take, and I'd hope that
14 from that, you know, we're going to talk about
15 what we think is plausible in that regard on
16 the ranges that we talked about earlier here,
17 and maybe that will help either give you a
18 sense of comfort or bring more questions to
19 light that we need to answer. So I do
20 appreciate your interest to be involved --

21 MR. CLAWSON: And I hope that I
22 never offend anybody by questioning, and I

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1 guess a lot of times there are a lot of, I
2 mean this is way over my head. It's out
3 there. These guys are in the scientific end,
4 and I'm down in the trenches where it's going
5 on, and I hope I never have offended anybody
6 by that. But I've always gone from the
7 standpoint of I've got to get a grasp on it,
8 and maybe that's a personal flaw or whatever
9 else like that, but I want to be able to make
10 sure that when I put my name on something I
11 really feel good about it and so forth. And
12 when these papers come to us, there's a lot of
13 questions in here, the airflow and so forth,
14 and I would appreciate to be a part of just
15 listening a little more.

16 MR. RINGER: I have a question.

17 CHAIR MUNN: Yes?

18 MR. RINGER: Yes, my name is Harold
19 Ringer again calling from Joliet, Illinois.

20 CHAIR MUNN: Yes?

21 MR. RINGER: Do you know what date
22 was the -- are you sure about this date when

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1 all this material was delivered in March of
2 1951? Do you have any confirmation on that?

3 CHAIR MUNN: We are sure of the
4 dates that our concerns cover. We are sure,
5 we're working only with the material contract
6 that was negotiated between this employer and
7 what the predecessor of the Department of
8 Energy, that is to say the AEC during that
9 period of time, and during that period of time
10 is the only period in which we have any
11 concern for Blockson Chemical.

12 MR. RINGER: I mean, do you have
13 any written documentation on that or no?

14 CHAIR MUNN: We do have
15 documentation with respect to the period
16 that's covered, yes.

17 MR. RINGER: Okay. But I mean as
18 far as the delivery of the material?

19 CHAIR MUNN: As far as the delivery
20 of the material?

21 MR. RINGER: Right.

22 MR. TOMES: This is Tom Tomes from

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1 NIOSH. We're a little confused, I believe, on
2 what you mean by the delivery of the material.

3 But what we have documentation on is some
4 government documents to sign a contract with
5 Blockson to extract uranium from phosphate
6 rock that was already being processed at the
7 facility. Blockson was already processing
8 this phosphate rock through Building 40, which
9 we've been discussing, and the contract with
10 the government was initiated initially in 1951
11 and was subject to divert some of that product
12 to Building 55 and extract the uranium from
13 it. So there was not a unique date associated
14 with delivery of product to Blockson before
15 this work.

16 MR. RINGER: Okay. Now, as far as
17 the ventilation at Building 55, would you say
18 there was like a piece of plastic on top of
19 the roof or what?

20 CHAIR MUNN: No.

21 MR. NETON: It was actually
22 Building 40 is the building that we were

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1 talking about, and I think the piece of
2 plastic you heard us talk about was plastic
3 cones that were put over the top of the
4 digester tanks in the 1960s or possibly 70s.

5 MR. RINGER: Okay.

6 MR. NETON: And that was to help
7 capture the exhaust or not exhaust but the
8 emissions from the tank.

9 CHAIR MUNN: And this was a period
10 of time well after the close of the period
11 that we are concerned with here.

12 MR. RINGER: Okay. Now, is there
13 going to be another future meeting with you
14 people or what?

15 CHAIR MUNN: I beg your pardon?

16 MR. RINGER: Is there going to be
17 another meeting come up or not?

18 CHAIR MUNN: There will be one more
19 meeting of this workgroup. We will not be
20 able to define when that will be until we have
21 the results of the technical discussion that
22 will go on between our contractor and NIOSH

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1 between now and that time.

2 MR. RINGER: Okay.

3 CHAIR MUNN: I'm currently hoping
4 that this meeting will occur no later than
5 shortly before the Board's full meeting in
6 December.

7 MR. RINGER: Okay, very good.
8 Thank you.

9 CHAIR MUNN: But there's no way,
10 that depends entirely upon the schedule of the
11 principals involved. We can't second guess
12 that right now.

13 MR. RINGER: Okay. Thank you very
14 much.

15 CHAIR MUNN: You bet.

16 MR. JERRY RINGER: Excuse me.
17 Could I have a possible question answered
18 here?

19 MR. KATZ: I'm sorry. Who is this
20 speaking now?

21 MR. JERRY RINGER: My name is Jerry
22 Ringer. I'm calling from Phoenix, Arizona.

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1 MR. KATZ: Yes. And you are
2 related to the petitioner?

3 MR. JERRY RINGER: Yes, I am.

4 MR. KATZ: Okay. Thank you.

5 MR. JERRY RINGER: You're welcome.

6 My question is the property that Blockson
7 Chemical Company is on right now, is this
8 property, right now is this occupied or being
9 used at any time now?

10 CHAIR MUNN: I certainly can't
11 speak to that. It has no bearing on our
12 activities, so I can't speak to it. Tom, do
13 you know?

14 MR. TOMES: I know it's fenced off,
15 and I can't say definitively. The plant has
16 been closed for, I think in 1991, somewhere in
17 that. Don't quote me on that, but it closed
18 sometime in the 90s.

19 MR. JERRY RINGER: Right. But I
20 guess what I was referring to is that since
21 all this, the chemicals and everything that
22 was going into the ground and the water issue

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1 out there, I guess I had this question of if
2 this property is not being used there must be
3 a reason for that.

4 CHAIR MUNN: No. The reason for it
5 could range from anything from financial
6 catastrophe to the fact that some owner died
7 and decided to close it down. But Bob
8 Anigstein is trying to tell us something.

9 DR. ANIGSTEIN: Two things. One is
10 based on the latest photographs from Google
11 Earth a good portion of the building have been
12 demolished, others are standing. And a good
13 reason why the plant would not be operating is
14 that it made phosphate, high sodium phosphate
15 which went into Tide detergent. Now, as of
16 some decades ago, all detergents no longer use
17 phosphates because of the environmental
18 problem, so that would have certainly put them
19 out of business.

20 MR. JERRY RINGER: Right. So it
21 was actually the manufacturing of whatever
22 chemicals was there is may be the reason why

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1 this property is empty at this time, if it is?

2 CHAIR MUNN: The original purpose
3 of the plant had nothing to do with what we
4 are concerned with here, and their business
5 prior to that time and after that time is --

6 MR. JERRY RINGER: No, I'm not
7 saying that. What I'm concerned with is that
8 with the contamination of uranium and other
9 chemicals that were used at Blockson Chemical
10 Company at that time, has there been any
11 regard to, you know, if that chemical or
12 whatever else is still in that ground?

13 CHAIR MUNN: We can't address that
14 for you. The only thing I could tell you is
15 that the quantity of uranium that was handled
16 there was extremely small indeed and would be
17 very surprised if it ever constituted any
18 hazard for either the workers or individuals
19 offsite.

20 DR. ANIGSTEIN: Yes, there was a
21 FUSRAP survey done back in somewhere around
22 1990, and they did clear the site. Whatever

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1 they found was cleared. I forget whether
2 clean up or whether it was -- but, I mean, the
3 site was declared clean of --

4 MR. JERRY RINGER: Okay. So it
5 actually had to be cleared, it actually had to
6 be cleaned and cleared?

7 CHAIR MUNN: It has been.

8 DR. ANIGSTEIN: It was clear.
9 Whether there was any cleaning involved, I'm
10 not sure.

11 CHAIR MUNN: We don't know.

12 DR. ANIGSTEIN: They may have
13 simply found it to be acceptable.

14 MR. NETON: We need to be careful.
15 I think the FUSRAP people were only looking
16 for evidence of contamination relative to the
17 DOE, AEC activity.

18 DR. ANIGSTEIN: Right.

19 MR. NETON: The fact that there may
20 be commercial residue of radioactivity there
21 from processing phosphate ore was not under
22 FUSRAP's purview.

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1 DR. ANIGSTEIN: Okay.

2 MR. NETON: So there may still be
3 contamination there related to, radioactive
4 contamination due to commercial activities at
5 the site that are unrelated to the AEC
6 activity. Now, our site profile does cover
7 some residual radioactivity through 1996,
8 indicating that at least part of the exposure
9 to the workers after the AEC period is covered
10 because of the AEC activities for 1996. They
11 must have, in 1996, cleared the site for other
12 activity or maybe that's when the buildings
13 were torn down. I'm not sure.

14 CHAIR MUNN: And if you're
15 interested in that, you can find that document
16 on the web site --

17 MR. JERRY RINGER: Okay.

18 CHAIR MUNN: -- for this
19 organization.

20 MR. JERRY RINGER: Okay.

21 CHAIR MUNN: All right?

22 MR. JERRY RINGER: My concern was,

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1 I guess my concern was if there was radiation
2 or -- my phone may die here and I may have to
3 call back. But my concern was if there's
4 still radiation from Blockson Chemical Company
5 in that soil after this many years, my concern
6 would be the amount of it that was there in
7 the 50s and those years that we're interested
8 in.

9 CHAIR MUNN: I understand.

10 MR. JERRY RINGER: I mean, if
11 there's still that type of something in the
12 soil or in the ground or possibly getting into
13 the water, underwater streams or whatever
14 that's in there, and it's still there. I
15 mean, if it's still there after this many
16 years, it had to be fairly potent I would
17 think in the early 50s.

18 CHAIR MUNN: Well, we can't address
19 that for you, but it's not necessarily true.
20 You know, all of your soil is radioactive
21 wherever you live. It's just a matter of
22 degree.

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1 MR. JERRY RINGER: I understand,
2 but I would think that more --

3 CHAIR MUNN: We just simply can't
4 address it for you because we don't have data,
5 and it's outside our purview. But thank you
6 for your interest.

7 Now, we're back to the issue of
8 whether it's possible for us to even begin to
9 establish times for you folks to get together,
10 or are you going to have to do that offline?

11 MR. NETON: I would like to talk
12 about our schedules a little bit. Nothing is
13 certainly going to happen until sometime in
14 November. Early to mid November is about as
15 early as I can envision getting together.

16 CHAIR MUNN: I wouldn't anticipate
17 anything earlier than that either. I would
18 hope we'd have an opportunity to do something
19 well in advance of the Savannah meeting since
20 it's -- I'm sorry. I'm determined to put that
21 next meeting in Savannah. It is going to be
22 in Augusta. Everyone please disregard my

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1 preference for Savannah. If we can have that
2 call in perhaps at that time, after we've had
3 that call, and --

4 MR. JERRY RINGER: I'm sorry. I
5 don't mean to interrupt. My phone died, so I
6 switched to another phone here. So I'm not
7 sure what was said after that, but that was my
8 main, I guess one of my main questions.

9 MR. KATZ: Thank you, Jerry.

10 CHAIR MUNN: If we can use as our
11 goal, that December Board meeting, for us to
12 have some additional information, something
13 new to bring to the table, it would be most
14 appreciated.

15 DR. ANIGSTEIN: And where is the
16 Board meeting?

17 MR. NETON: Augusta.

18 CHAIR MUNN: Augusta, Georgia.

19 MR. KATZ: So now that we've
20 established that, Wanda, I think you'll be
21 pressed to get a workgroup meeting in before
22 the Board meeting in Augusta, but maybe you

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1 can have a phone call meeting, but you're
2 running up against --

3 CHAIR MUNN: I know I am. I know I
4 am.

5 MR. KATZ: -- a difficult --

6 CHAIR MUNN: And I learned
7 yesterday that Mark was not going to have a
8 subcommittee meeting on the morning of
9 Tuesday.

10 MR. KATZ: Correct.

11 CHAIR MUNN: So there's always a
12 possibility that we might be able to do that.

13 Any workgroup meeting that we had would, by
14 necessity, be very brief, and that may be the
15 only possible time. We may utilize that time
16 if it comes down to that. But in any case,
17 we'll certainly have to have some
18 recommendations to take to the Board, more
19 information.

20 MR. ELLIOTT: That presumes Mark is
21 not going to have a subcommittee meeting
22 Tuesday morning, but it presumes the Board

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1 meeting won't start Tuesday morning and it
2 very well could.

3 CHAIR MUNN: Yes.

4 MR. KATZ: We have a pretty heavy
5 agenda, I think.

6 CHAIR MUNN: We may not be able to
7 do it, but we'll do the best we can when we
8 find out what your schedule is going to be.
9 Then we'll try to work from there.

10 MR. CLAWSON: Also, too, Wanda, you
11 know, we have said the data and this OTIB is a
12 new one out that has not been reviewed. If
13 any way possible, if they could, and I believe
14 Dr. Melius is over that one, isn't he? The
15 surrogate data?

16 CHAIR MUNN: That's what I was
17 talking to him about this morning when he
18 pointed out they're not to that point yet, but
19 he has sent the material out. Everyone has
20 it.

21 MR. NETON: I know for a fact Dr.
22 Melius is attempting to schedule a meeting of

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1 the surrogate data workgroup before the next
2 Board meeting sometime in November or early
3 December.

4 MR. CLAWSON: I know what we talked
5 about it at the last Board meeting and so
6 forth like that, and there was a mis-
7 communication there and now it's out.

8 MR. NETON: And also I think, it's
9 my understanding that SC&A has been tasked
10 with reviewing that document at the last Board
11 meeting.

12 MR. CLAWSON: That was my
13 understanding, too.

14 MR. ELLIOTT: IG-004? This is
15 Implementation Guide 004, which addresses how
16 we go about using surrogate data.

17 CHAIR MUNN: Yes, it's been
18 announced. All right. I will rely upon NIOSH
19 to get back to me with your schedule for the
20 technical conference call.

21 MR. NETON: Bob, do you want me to
22 work through you, or should I contact John to

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1 schedule this? How do you want us --

2 DR. ANIGSTEIN: Well, it doesn't
3 matter, but, I mean, I will, you know, John
4 needs to be in the loop, so probably both of
5 us. He's going to want to be on the call.

6 MR. NETON: Okay. I'll just make
7 sure you --

8 DR. ANIGSTEIN: Yes.

9 CHAIR MUNN: I'm fairly sure John
10 will be back by early next week.

11 MR. NETON: Just one more question.

12 Is it my correct understanding that we have
13 no further issues related to uranium and the
14 uranium bioassay and dose reconstruction of
15 that source term?

16 CHAIR MUNN: If I heard correctly,
17 I asked that question at the end of each one
18 of the items that we addressed here today, and
19 I got no indication from anyone that there
20 were unresolved issues with any other item
21 other than this one.

22 MR. KATZ: We actually had an

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1 affirmative statement that this was decided
2 and resolved.

3 MR. ELLIOTT: You asked
4 specifically do you accept the NIOSH
5 explanation?

6 CHAIR MUNN: Yes.

7 MR. ELLIOTT: On that one, as well
8 as the maintenance worker assumptions?

9 CHAIR MUNN: Yes.

10 MR. KATZ: As well as the data
11 quality concern.

12 CHAIR MUNN: Correct.

13 MR. ELLIOTT: As well as data
14 quality.

15 CHAIR MUNN: Yes, I asked that for
16 each of them, so this is our only outstanding
17 issue in terms of agreement from the present
18 Board members. That being the case, I will
19 rely on you gentlemen to notify us of when
20 that call is going to take place, and we'll
21 try to plan accordingly. Does anyone else
22 have any issues that they wish to address

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1 before we adjourn? If not, we will adjourn
2 this meeting, and I will see you somewhere in
3 Georgia.

4 (Whereupon, the foregoing matter
5 was concluded at 2:05 p.m.)
6
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8
9
10
11
12

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