

1 processes, a lot of that can be inferred from
2 the document.

3 Important again, I mentioned the ores and other
4 feed forms. After World War II, most of the
5 ore coming in I believe was foreign ore. Some
6 Canadian ore came in at ten percent uranium by
7 weight. I believe Belgian ore was still coming
8 in and it was extremely high in uranium. I
9 think it was some -- somewhere around 65
10 percent by weight uranium, I mean tremendous
11 process, interesting to speculate the
12 geochemistry of how something would -- would
13 form in the earth in that concentration in one
14 spot.

15 So this is all described in this section and
16 goes through the residues and the effluents.
17 There is a section there dealing with -- there
18 was a discussion at the Board meeting last time
19 about how NIOSH is handling the exposure to
20 non-uranium issues when you get into residues
21 and effluents, and I'll discuss that a little
22 later when we talk about internal dosimetry.
23 They do need to be treated differently. By and
24 large, the facility -- to our knowledge -- we
25 only have available information related to the

1 uranium monitoring in urine, so one needs to
2 make some inferences when we're talking about
3 these special exposures to residues and
4 effluents. I think you'll -- you'll hear some
5 comments later from folks at SC&A about sperry
6 cake.

7 Okay. This is -- this is really to my liking,
8 the meat of the profile, as a health physicist.
9 This deals -- 75 pages or so of the
10 radiological characteristics and conditions,
11 and most importantly, what type of data do we
12 have to be able to attempt to reconstruct some
13 of these doses.

14 Units, limits and recommendations, it's
15 interesting that after '49 you're still in the
16 70 dpm per cubic meter range for uranium as a
17 preferred level or a tolerance limit. In this
18 era, 300 milliroentgen per -- per month was
19 considered to be the limit, so 15 rem per year
20 was the exposure limit, and we have evidence
21 that workers were being exposed in those -- in
22 those -- at those levels.

23 The radioactivity content and handling of the
24 ore, uranium products and residues really just
25 goes over and has some detail about what --

1 what are the constituents of these different
2 materials, and what should one use as default
3 assumptions when doing dose reconstructions.
4 For example, there's a section now dealing with
5 ore that talks about a ratio of assuming 100 to
6 one radium to uranium when the ore is -- is --
7 if you're in a production facility that was
8 handling the ore. Fairly conservative upper
9 limit because I think that's the highest value
10 that was found in the tables.
11 Uranium products, of course we have available
12 monitoring data for uranium in urine. There
13 are also air dust samples that were taken about
14 the facility, and then the residues and wastes,
15 there are some tables in there for how to deal
16 with the fact that workers may have been
17 processing these thorium residues to be shipped
18 back to Mound, what type of equilibrium values
19 were used, that sort of thing.
20 Internal dosimetrically there are default
21 values included in here about particle size.
22 The profile right now assumes five micron
23 particle size as a default based on some data
24 that were taken by -- I think it was in the
25 Eisenbud era, I've forgotten, where they came

1 up with a mass median diameter of around two to
2 three, which roughly, for uranium density,
3 equates to around five microns.
4 Solubility, there's a table in there that talks
5 about what solubility form should be
6 considered. It is our intent, although I will
7 agree that it's not clear in the profile but
8 it's consistent with our other profiles, where
9 we don't know the solubility in the particular
10 operation we will assume the solubility class
11 from an inhalation perspective that delivers
12 the highest dose to the organ under
13 consideration. That's been part and parcel to
14 our program and we're going to continue to
15 pursue that practice in -- in this -- in these
16 dose reconstructions.
17 The compensation considerations I talked about,
18 how does one handle these non-uranium -- after
19 -- you know, after the uranium is extracted you
20 have the residues; how do you deal with the
21 composition of these materials based on the
22 isotopic ratios of the radioactive elements
23 that are remaining.
24 The airborne dust levels, there's -- there's a
25 fair amount of dust level data, thousands of

1 samples. I'll talk to that a little bit. In
2 the subsequent section there's a discussion of
3 how one deals with these dust samples. There
4 are enough dust data that have been collected
5 by year to assign values in various facilities
6 about the plant, and the profile -- I think
7 there is over 40-something tables in there that
8 list what dust levels to use by job category by
9 year for various plants and facilities.
10 We're still wrestling with the idea -- again,
11 this is to be used by the dose reconstructors
12 as a road map. One needs to be careful, and we
13 had a discussion this morning about what is
14 relevant, is it the geometric mean of the air
15 dust distribution in a facility or does one use
16 the 95th percentile. We maintain that if --
17 and we agree with SC&A. If you know nothing
18 else, if you don't know what facility the
19 person worked in and you have no other
20 evidence, then you should use the 95th
21 percentile of the air dust data distribution.
22 However, as you'll see later in the -- in the
23 years that we're talking about here, we have a
24 fair amount of uranium and urine monitoring
25 data that we can use to bracket these exposure

1 scenarios. And we need to take -- we will take
2 advantage of that when we're doing these
3 analyses, where appropriate.

4 Respirator use, just to mention briefly, we
5 take no credit in the profile for respirator
6 use, even though we know there were instances
7 where respiratory protection was worn. It's
8 just not possible for us to go back this far in
9 time and make any kind of reasonable estimates
10 as to what percentage of workers wore
11 respirators and who wore them, so you'll see
12 that. Now this makes it a little interesting -
13 - and I'll talk about later -- comparing the
14 urine data to the air sample data because, for
15 example, if you have urine data that is lower
16 than the air sample data, one doesn't know
17 whether that's because the urine data is not
18 appropriate or whether the person happened to
19 be wearing a respirator. There's a number of
20 reasons why those values might not be able to -
21 - to balance.

22 And there -- there are data in there, and this
23 is new, a fair amount of additional radon
24 monitoring data is in this profile, and there
25 are radon levels by plant. Admittedly, they

1 are quite variable. Radon is, as we heard this
2 morning, is very difficult to predict. Even if
3 you know the source term you need to know such
4 things as ventilation rate and process through
5 -- through put, that sort of thing. But we
6 believe we have sufficient radon data, as I'll
7 show you in a few seconds, to be able to
8 bracket at least the upper range of the
9 exposures for radon by certain buildings.

10 Okay, just to move through the radiological
11 characteristics, internal dose considerations,
12 there's -- there's a several-page discussion of
13 surface contamination. There are not a lot of
14 surface contamination values listed there. The
15 ones that do exist predictably show some fairly
16 high significant surface contamination levels.
17 There is evidence of some decontamination bound
18 to existing standards at the time that are
19 included in there. But we don't believe, at
20 least from an inhalation perspective, that
21 surface contamination from resuspension is
22 problematic for us because we believe that we
23 have air sample data that would include the
24 resuspension at that time.

25

1 So -- and this chapter also summarizes the
2 information and available data based on the
3 urinalysis data, the radon data -- breath
4 analyses I might want to mention just briefly.
5 Radon breath analysis has nothing to do with
6 measuring the radon concentrations or inferring
7 the radon concentrations or exposure to workers
8 in the air at the plant. Radon breath analysis
9 is an indirect technique to measure the radium
10 226 body burden of the worker. The idea is
11 that if you inhale radium 226 or incorporate it
12 into your skeleton, which is the ultimate
13 repository, you will eventually breathe out
14 radon gas at a certain rate. And knowing the
15 physiology of that and doing a few calculations
16 and calibrations, one can infer how much radium
17 one breathed in by the amount of radon one
18 breathes out. So these are important, but not
19 necessarily related at all to radon levels in
20 the plant. That's going to be important later
21 when I talk about some of the data gaps.
22 Almost -- I'm not aware of any whole body
23 counting data at Mallinckrodt, or lung counts,
24 so we have no ability to rely on those to help
25 bracket -- bracket the pictures. So we have

1 urinalysis data, a fair amount; we have radon
2 breath analyses and we have radon data, which
3 is not listed here but we certainly have a fair
4 number of those.

5 External dose considerations, one has the gamut
6 of exposures. You have beta exposures from the
7 uranium, from the protactinium 234-M/and*
8 daughters that grow in. You have gamma
9 exposures from the -- from the progeny in the
10 ore stream. When you have high radium 226
11 values, you also have high gamma exposures from
12 -- from the ore and the raffinate material, and
13 these non-specific beta-gammas are just
14 mixtures. So you've got a fairly complex
15 mixture.

16 In this profile, even though there are some
17 high energy photons involved here, it is
18 conservatively assumed that the exposures
19 occurred in the 30 to 250 keV range, which --
20 if one is familiar with our radiation
21 effectiveness factors -- would double the
22 radiation effec-- it would multiply the dose
23 times two, as far as equivalent risk from the
24 exposure.

25 Neutrons are not a major issue here. The only

1 instance where neutrons -- neutron -- there is
2 no monitoring data for neutrons, primarily
3 because it's just a low potential for exposure.
4 One can generate some neutrons based on the
5 alpha interac-- alpha end reaction with light Z
6 materials like fluorene, so for instance,
7 uranium tetrafluoride or thorium tetrafluoride,
8 which I believe was made at one point at
9 Mallinckrodt. One can do some calculations and
10 in fact there is an appendix -- a table at the
11 back that provides neutron dose rates from --
12 from the alpha end reaction for -- with -- with
13 thorium that can be used to reconstruct some
14 fairly small neutron doses. And there was a
15 radium -- a radium beryllium source, I believe,
16 used in a laboratory -- it was called a shotgun
17 laboratory -- to do some non-destructive
18 testing measurements, and that's discussed in
19 the profile.

20 Okay, moving along with external dose, film
21 badges were -- were used to measure the
22 external dose. We have a large number of those
23 measurements. It was a standard, two-element
24 film badge with a cadmium filter covering one
25 side and an open window on the other side. Not

1 a lot of information about procedures for
2 calibration, but we do have evidence that they
3 were radiated and calibrated with a radium
4 source, essentially a radium platinum-clad
5 needle. It was the same film badge used
6 throughout the processing of the plant, from --
7 we believe through the -- through the
8 production days, anyway, from '49 to '57, for
9 sure, the same dosimeter badge.

10 Not much in the way of external dosimetry was
11 provided. In the profile that essentially says
12 we have to evaluate that on a case-by-case
13 basis. That of course would only affect dose
14 reconstructions for the extremities where there
15 were large discrepancies in the fields that a
16 worker may be engaged with, such as working in
17 a glove-box or that sort of thing.

18 Occupational X-ray exams, like all profiles, is
19 discussed here. We are assuming an annual
20 chest X-ray, whether we have indication that
21 the worker was ex-- had an annual chest X-ray
22 or not, and we have no knowledge of the process
23 of the X-ray equipment during that era, but we
24 do have a generic Technical Information
25 Bulletin that talks about what the likely

1 exposures were to X-ray exams during certain
2 time periods in the past, and that's what's
3 used here.

4 Of interest here is that between 1942 and '44 I
5 think pelvic exams were required for people
6 working with fluorene compounds, hydrofluoric
7 acid, that sort of thing, and I wasn't familiar
8 with this but apparently fluorosis is an issue
9 where if you have high exposure to the fluorene
10 it tends to wreak havoc with your bones and
11 your connective tissue. And so pelvic exams
12 were used to look for the effects of fluorene
13 on the skeleton.

14 **DR. MELIUS:** Pelvic X-rays, I believe. Right?

15 **DR. NETON:** Did I say pelvic X-rays?

16 **DR. MELIUS:** No, you said --

17 **DR. NETON:** Oh, I'm sorry, pelvic X-rays, not
18 pelvic exams, sorry. Thank you, Dr. Melius. I
19 of course am not a physician, so -- yeah,
20 pelvic X-rays.

21 **DR. MELIUS:** It had some of us wondering here.

22 **DR. NETON:** Okay. Other data included in here
23 at the end of the radiological characteristics
24 are the number of workers by different --
25 different plants, number of hours worked, so

1 that one can have an idea -- if they're using
2 surrogate data -- of how many hours per year
3 one should use. In general, it's not --
4 although there's evidence that people worked
5 additional hours -- Saturdays and overtime,
6 that sort of thing -- somewhere in the area of
7 40 to 45, 46 hours a week is -- is generally
8 considered to be reasonable for these dose
9 reconstructions.

10 And there's tables in the back that have
11 delineated the job titles and the work areas of
12 workers based on data from a number of sources.
13 The bioassay records have job titles. The TLD
14 and film badge measurements have job titles, so
15 there's an effort in here to compile and list
16 all of these job titles and work areas for the
17 dose reconstructors.

18 Now to get to the meat of the issue related --
19 the monitoring -- related to the monitoring
20 data, I mentioned we -- there's a fair amount
21 of data and I'm only summarizing what's
22 available '49 to '57, although realistically
23 there's not much more than this because prior
24 to '49, as we all know, there weren't -- were
25 very few samples taken. So between '49 and '57

1 there's about 8,860 or so uranium air samples.
2 These are dust samples taken in the various
3 facilities at the plant. This is the basis of
4 these tables at the back that show what the
5 concentrations of uranium may have been in the
6 air, by facility by year.

7 I talked about breath radon earlier. There's
8 2,321 breath radon samples. Those would be
9 used, as I indicated, to infer radium body
10 burdens of workers, not radon air
11 concentrations. There's about 7,200 film badge
12 measurements, but I need to qualify that.
13 That's actually 7,200 person years of film
14 badge data. In other words, these are annual
15 roll-ups, so this is the annual film badge
16 roll-ups for the workers during this time
17 period. And if there were weekly or bi-weekly
18 measurements, then this represents roughly
19 somewhere -- could be 300,000 to 400,000
20 individual film badge measurements, a large,
21 large number of film badge measurements in this
22 era. And as you'll see later, most of the
23 workers were monitored with film badges at
24 Mallinckrodt in these years.

25 There's 4,700 radon air samples, approximately.

1 I've indicated that radon is difficult to
2 estimate because of parameters we talked about
3 earlier -- ventilation rates and emanation
4 rates and all those sort of things. But with
5 these -- this amount of data, 4,700 samples, we
6 believe that it's very possible to put upper
7 limits of exposures by certain facilities for
8 workers. And in fact, we've been using these
9 data in -- to reconstruct some doses for lung
10 cancers. The way our radon lung model works is
11 if you've got some hefty doses that we've seen
12 from some of these areas, it's sufficient in
13 and of itself for compensation in many cases,
14 and where we can we use that to our advantage
15 to do dose reconstruction.

16 There's a little over 13,000 urine samples that
17 have been taken between '49 and '57, so it's a
18 goodly number of samples. There was a routine
19 program in place during this time period. It
20 was not a routine program that was taken
21 monthly. I would say that the sampling
22 frequency was variable, but it is not unusual
23 to have someone sampled every three to six
24 months in that time frame.

25 Okay, this is a breakdown of the individual

1 monitoring data, and we have a column here
2 labeled workers. I should qualify that. These
3 are workers as identified in the Mallinckrodt
4 epidemiologic study that was conducted. And
5 typically epidemiologic studies talk about
6 white male workers, you know, in a certain
7 facility. We believe that it's fairly
8 indicative of the work force. There weren't
9 many female workers allowed into the production
10 area in those eras, or working in the
11 production areas, so we believe this is a
12 fairly reasonable indicator of the work force.
13 And this is the Manhattan Engineering District
14 work force. I don't believe this represents
15 the entire Mallinckrodt facility or the
16 chemical activities, but these are the people
17 who were working in the -- in the Manhattan
18 Engineering District operations.
19 What you see here, though, is a very
20 interesting picture. I think the lowest
21 percent monitored, whether it's urine or film
22 badge, is around 50 percent between 1959 -- '49
23 and '57. So we have monitoring data on many of
24 the workers, if not almost all of the workers
25 in the later years. This gives us a fair

1 amount of comfort that we know what these
2 workers were exposed to with the individual
3 monitoring records, and in fact much of the
4 site profile -- the 250 pages of site profile
5 would not be relevant to many of these workers
6 if we indeed have their -- almost their entire
7 monitoring history. We're really just filling
8 in some gaps, and in some cases may be no gaps.
9 Now I mentioned the urine program was not a
10 weekly/monthly type thing. I think if you look
11 at this and add up the number of samples
12 compared to the number of workers, you end up
13 with maybe a couple of samples per year for a
14 worker or something to that effect. But
15 anyways, you have data. So if we have several
16 urine samples per year on a worker, that is
17 sufficient for us to bracket the worker's
18 exposure to uranium in the plant. It doesn't
19 matter to us -- at least the way we do this --
20 if there were incidents. The incidents are
21 covered in the urine monitoring program. They
22 would show up, and we can say that if the
23 person was excreting this amount of uranium in
24 their urine, then there is no way that an
25 incident could have moved them above that

1 level, given certain constraints. So we intend
2 to take advantage of that in this profile.
3 Okay, this gets into chapter -- section six
4 that talks about how you do these radioactive
5 intakes and dose, and this is really where --
6 how do you use these tables that are in the
7 back. You have these tables that delineate
8 dust concentrations by facility by year.
9 There's also tables that delineate intakes by
10 year for urine. If you -- if you look, you can
11 get -- based on the urine data that were
12 available, ORAU went back and modeled what the
13 intake per year would be in these facilities --
14 again, based on the urine samples that were
15 available. This gives one the ability to
16 compare intake per year based on urine, based
17 on air sample, to get a feel that they're both
18 in the same ball park. That will become
19 important as I finish up my presentation to
20 address this data integrity issue, I believe.
21 This area here, the estimated intake using
22 time-weighted daily average exposure, that is
23 what is used. The time-weighted daily
24 exposures, we know from the Bethlehem Steel
25 era, is really just what was a person exposed

1 to throughout the duration of the day, not the
2 peak concentration. And it's a way to get more
3 accurate depiction of what a worker's intake
4 was during the year -- or during the day.
5 This needs to be looked at. We -- we -- if we
6 only have these data here, without anything to
7 bracket it using the urine data, then we agree
8 with SC&A's assertion that the 95th percentile
9 is more appropriate. If one, however, has
10 urine data to help bracket the intakes, then
11 we're not certain that then one really needs to
12 go to the level of -- of using the 95th
13 percentile, although -- you know, when there is
14 a doubt, we will certainly err on the side of
15 the claimant and be favorable and increase the
16 dose.
17 And again, these are how to use these tables
18 where you have maybe spotty gaps in the data.
19 They're instructions about how one would fill
20 in those blanks.
21 Okay, external dose is a very similar thing,
22 although I will state that the external
23 dosimetry section right now has sort of some
24 bold letters on top that says right now do not
25 use a surrogate -- do not use the data that's

1 in these tables for -- for anything other than
2 limited dose reconstructions. And the reason
3 is that ORAU has not yet completed the
4 evaluation of the -- of the composite external
5 dosimetry data that are available. I mentioned
6 there were a large number of external dosimetry
7 results -- I've forgotten how many -- the
8 annual results by year, but the large number of
9 results have not been tabulated and put into
10 distributions usable by dose reconstructors.
11 There are some data in there that give you a
12 feel for what the doses may have been by
13 facility, but we believe -- to do a better job
14 -- those things need to be filled out in more
15 detail and that's currently ongoing.
16 I did mention, though, that this does not
17 preclude us from doing dose reconstructions for
18 workers who we happen to have complete
19 monitoring data for. Again, the only reason
20 one would use those surrogate tables is when
21 you have an unmonitored worker, and in most of
22 the time frames we have monitoring data for the
23 vast majority of the workers.
24 Okay. There are some indi-- there's some data
25 in there about what type of exposure geometries

1 to use by job category, whether it's locational
2 or anterior/posterior, isotropic, that sort of
3 thing. And photon energy ranges are defaulted,
4 as I mentioned, to three -- 30 -- 30 to 250
5 keV.

6 Other external exposures, there's not much in
7 here. I mentioned extremity dosimetry was not
8 very prevalent, almost no data in that area.
9 Submersion in a cloud we believe is only
10 relevant to reconstruction of surficial organs,
11 and that would be handled on a case-by-case
12 basis. And the shallow dose -- right now there
13 are beta dose windows that we believe are --
14 accurately depict the beta dose and we're
15 taking those at face value and assigning them
16 for shallow dose.

17 Okay. A little bit at the end of the
18 presentation about these data integrity issues
19 that have been raised, and this is going to be
20 discussed in more detail in Larry Elliott's
21 presentation tomorrow, but I thought I'd
22 briefly touch on it 'cause it certainly is
23 relevant to our ability to reconstruct these
24 doses.

25 It was raised by the Special Exposure Cohort

1 petitioners, there's a couple issues, I mention
2 two of them here. One was the practice of
3 recording zero exposures for workers when --
4 when they were monitored, and our
5 interpretation of that is they were not -- high
6 values were not made zero, but they were
7 recorded as zero if they were not monitored.
8 Internal Mallinckrodt regarding hiding worker
9 exposure results, there's the Mont Mason
10 information that talks about maybe not
11 reporting something to the workers because it
12 might upset them, or something to that effect.
13 These things, in and of themselves, are
14 disturbing. But we believe, given the amount
15 of data and the variety of data that we have
16 after 1948, that we have sufficient data to
17 evaluate the concern. And otherwise, to do a
18 validation almost of the datasets to make
19 ourselves feel comfortable that we're not
20 missing large chunks. Now I have a very brief
21 example here to show you -- I hope you can see
22 it.

23 This is a hypothetical example. I was hoping
24 to have a real world example based on
25 Mallinckrodt. I didn't have time to get it

1 together. But we have -- there's three types
2 of data, and I mentioned this at the last
3 meeting. You could have air monitoring data,
4 you can have urine monitoring data, and you
5 also have the source term data. What happened
6 at the plant, what type of mechanical equipment
7 was there to generate airborne, that stuff.
8 And one can -- can compare these three values
9 to see that one has a consistent picture. Now
10 I'm not suggesting that on a -- on a week-by-
11 week basis, or even a month-by-month basis, but
12 on an annual basis I think if we take the
13 aggregate data, one can make a comparison. And
14 again, I just made this up, so this is not a
15 real plant site example, but let's say for
16 instance that we had time-weighted air
17 concentration data that tended to look like
18 this, that started in '49 and trended down in
19 '56 and we would think great, you know,
20 engineering controls are being put in place.
21 Maybe things are going down and everything's
22 hunky-dory.
23 Now we'll go look at the urine data and we see
24 the urine data is indicating that the picocurie
25 per year intake based on the available data is

1 way up here. Well, that would certainly raise
2 a flag in my mind because it's almost
3 impossible for these data to be lower -- to be
4 -- this data to be lower than these data, for
5 many reasons, as I mentioned.

6 Now if we took a source term evaluation and
7 compared it -- for instance, what were they
8 doing -- there -- there are guidance documents
9 out there such as new Reg. 1400 that were
10 really there to say when do you need an air
11 monitoring program, but one can sort of
12 reverse-engineer the calculations and say what
13 would be my predicted range of concentrations -
14 - and I apologize, I don't have uncertainties
15 on here because this is a made-up example, but
16 we could certainly do that -- and compare these
17 two values, the source term, the urine and --
18 and the air data, and say do we have a problem.
19 And this, in my mind, would clearly indicate
20 that we have a huge issue. Something happened
21 here to artificially lower -- lower the air
22 sample data.

23 So we can go through, based on these picocurie
24 per year intake evaluations that have been done
25 for the various plants to see at least if

1 they're consistent in the right area. They're
2 not going to be perfect. I cannot guarantee
3 that there wasn't one sample that has been
4 discounted or something to that effect, but it
5 at least gives you a feel that there was not a
6 wholesale ignoring of important data or hiding
7 or reporting things as zero that were very
8 significant.

9 So that -- that's the intent of what I wanted
10 to talk about here. We have not done this yet.
11 We certainly intend to go back and do this and
12 demonstrate that we were comfortable with the
13 datasets that we do have.

14 Okay. With that, I think I've concluded my
15 presentation.

16 **DR. ZIEMER:** Thank you very much, Jim. I think
17 we'll open this for questions and then we'll
18 proceed.

19 Okay, Mark -- Mark Griffon.

20 **MR. GRIFFON:** I feel bad you didn't get any
21 questions.

22 **DR. NETON:** I was going to say, you weren't
23 going to let me get off that easy, Mark.

24 **MR. GRIFFON:** Everybody's getting a little
25 tired.

1 The film badge data, I'm curious if you have --
2 you said annual roll-up data. Do you have the
3 monthly data, also, or is it only the annual
4 roll-up data available?

5 **DR. NETON:** I think -- I don't think the
6 monthly data are coded. Tim, do you know any
7 more on the monthly data? I wish I knew. I
8 believe that the data exists somewhere, but we
9 have not -- they're not coded, they're not
10 available at this time, but I think -- I think
11 -- I need to check on this, but I'm pretty sure
12 we do.

13 **MR. GRIFFON:** And I guess another --

14 **DR. NETON:** I'm sorry, Dick -- Dick Toohey
15 seems to --

16 **DR. ZIEMER:** Dick Toohey is approaching the
17 mike, ORAU.

18 **DR. TOOHEY:** Let me preface this answer with a
19 well-known phrase, to the best of my knowledge
20 and belief, we have the monthly data and it is
21 being entered. And you know, it was in hard
22 copy form so it's being entered into the
23 spreadsheets, so it's not yet analyzed and able
24 to be used for dose reconstruction, but it is
25 on hand.

1 **DR. NETON:** Thanks.

2 **DR. ZIEMER:** Follow-up, Mark?

3 **MR. GRIFFON:** Yeah, not -- not so much -- kind
4 of a different topic. On the -- you mentioned
5 the urinalysis data. All -- all of that is
6 uranium -- total uranium data or gross alpha or
7 what -- what --

8 **DR. NETON:** Yeah, it's uranium data -- it's
9 fluorometric, so it's a mass measurement,
10 micrograms per liter, that sort of thing. It's
11 a standard fluorometric technique.

12 **MR. GRIFFON:** And they -- and they didn't do
13 any measurements for the other contaminants
14 that you mentioned other than the breath radon
15 for radium.

16 **DR. NETON:** That's correct, the breath radon
17 was measured for radium, so -- I think I know
18 where you're driving here is we don't -- we
19 don't have any bioassay data for the -- the
20 daughter products that would have been
21 concentrated in the waste streams, but we do
22 have air data that was measured for alpha dpm
23 per cubic meter, and the profile goes through
24 and guides the dose reconstructor as to what
25 ratios one should assume in those alpha dpm per

1 cubic meter measurements.

2 **MR. GRIFFON:** Based -- based on source --
3 source term percentages and -- yeah.

4 **DR. NETON:** Source term percentages, but
5 there's also the issue -- I know that the
6 sperry cake issue, which is the reprocessing of
7 some of the sperry cake to get the thorium 230
8 for Mound -- I believe that's what it was for.
9 Those ratios are somewhat different and we do
10 have available data, and I know that Mark has
11 some of those references, as to what the
12 isotopic compensation of the sperry cake were.

13 **MR. GRIFFON:** Yeah, I -- I actually just got
14 these references. Janet Westbrook did follow
15 up and -- from a -- I guess that was a
16 workgroup call, I'm not sure what -- anyway, I
17 had requested references on the concentrations
18 of these other contaminants in the sperry cake
19 and the airport cake, and I have them now. And
20 I do have a question on some of -- I -- I'm
21 wondering -- the sperry ca-- maybe you can
22 speak to the sperry cake and airport cake and
23 where that might have been an issue at the
24 plant. Was it only in one area of one
25 building, was it -- how -- how -- where and how

1 might it have --

2 **DR. NETON:** Yeah, I wish I could speak more
3 intelligently about that. It was an effluent
4 stream. I don't know that they had more than
5 one sperry cake filter area, that would be my
6 guess but I really don't know. Janet Westbrook
7 would probably know better. It did end up
8 going out to the St. Louis Airport site, but I
9 -- I can't tell you exactly how widespread it
10 was. I think it was relegated to one
11 particular plant, but I need to check the
12 profile and talk to Janet.

13 **DR. ZIEMER:** Jim, let me ask a question that
14 pertains to the Mallinckrodt monitoring data
15 but may also apply to other sites, as well.
16 Most of this time period, the late '40's, early
17 '50's, I think the regs still were addressing
18 perhaps weekly limits, something like that, as
19 opposed to annual limits. I don't even recall
20 when the switch-over occurred. But many sites,
21 once they established that they had met a
22 weekly limit, they felt they were pretty well
23 done. And I've seen sites where they really
24 didn't keep track of -- in fact, they would
25 assign a badge number of some -- to a different

1 person with the same badge number and so on.
2 Do you run across that in a site like this or
3 are you able to uniquely identify -- is there a
4 consistency where workers, for example, get the
5 same badge number each month or week --

6 **DR. NETON:** I don't know about the exact same
7 badge number, but we do have indications that
8 the workers were monitored -- in fact, there
9 are assertions in documents at Mallinckrodt
10 that anyone who entered the Manhattan
11 Engineering District area, the proc-- what we
12 would call the process area, was required to be
13 badged, visitors included. So all worker --

14 **DR. ZIEMER:** Did they maintain, for example,
15 annual totals on them, even though that wasn't
16 required, and...

17 **DR. NETON:** I can't answer that directly. I
18 know that we have the annual totals. I don't
19 think that they were added up from the
20 individual data because then we would have had
21 it computerized. So they were added up at one
22 point. Now I don't know whether that was done
23 retrospectively by Mallinckrodt or not. But
24 you're right, the exposure was 300 millirem per
25 -- per month --

1 **DR. ZIEMER:** Per month.

2 **DR. NETON:** -- in those time periods.

3 **DR. ZIEMER:** Mark?

4 **MR. GRIFFON:** Just a question, Jim, on the --
5 could you describe the -- I mean I don't know
6 if it was the same over the -- I guess the main
7 question is over the '49 to '55 or '57 time
8 period, the -- the bioassay program for the
9 uranium, what frequency of sampling -- I think
10 they did Monday morning -- could you just
11 expand on a little bit of (unintelligible).

12 **DR. NETON:** Yeah, I can only tell you that it
13 certainly wasn't like a monthly sampling
14 program. It was -- it was quarterly, at best,
15 to my knowledge, from what I've seen in the
16 reports.

17 **MR. GRIFFON:** Mostly annual, is that --

18 **DR. NETON:** Some annual, some quarterly, maybe
19 bi-annual, but it was considered a routine
20 program. Now just because it was annual
21 doesn't mean we can't do anything with it. In
22 fact, that actually drives up our -- our missed
23 dose estimates because you would then have to
24 assume that, you know, when -- what the chronic
25 exposure was that could result in an annual

1 exposure below that value. But yeah, I don't
2 think more than a couple times a year was
3 probably the average for workers, at most. It
4 wasn't -- it wasn't what you consider like a --
5 a contemporary program today where you'd have a
6 monthly urine sample that was taken after the
7 end of the -- the weekend, that sort of thing.

8 **MR. GRIFFON:** Did -- did you interview any
9 workers on -- on the bioassay practices, former
10 workers, claimants? I think it -- I -- I think
11 the TBD or the -- the site profile mentioned
12 Monday morning sampling before they went on
13 their shift, which -- which is understandable.

14 **DR. NETON:** Right. Right.

15 **MR. GRIFFON:** I'm just wondering if -- you
16 know, if they -- I've heard some stories, not
17 necessarily at Mallinckrodt but other plants
18 where they say they'd have a -- you know,
19 they'd be off on vacation for two, three weeks,
20 then they'd come back and that'd be the first
21 thing they'd do, so I just wonder if -- you
22 know.

23 **DR. NETON:** Yeah, I don't recall that ORAU or
24 NIOSH has interviewed the workers on the urine
25 program.

1 **DR. ZIEMER:** Yes, Dr. Melius.

2 **DR. MELIUS:** I've been puzzled by your last two
3 slides, which is this presentation of this sort
4 of hypothetical approach that you might use to
5 address some of the data integrity issues
6 raised by the petitioners, I believe --

7 **DR. NETON:** Uh-huh.

8 **DR. MELIUS:** -- if I understood that --

9 **DR. NETON:** Right.

10 **DR. MELIUS:** -- correctly. And if I understood
11 you also correctly, you've not really ever --
12 you haven't done this yet.

13 **DR. NETON:** That's correct.

14 **DR. MELIUS:** Yeah. And theoretically, if you
15 did do this, one could -- and found a
16 discrepancy of -- of the type you show in your
17 hypothetical slide there, hypothetical example,
18 one could make an adjustment, but one could
19 also end up with a situation where the
20 discrepancies were so great that one would --
21 that would in fact support the charge by the
22 petitioners and say that look, the data here is
23 so terrible or whatever that we can't pretend
24 to understand it. I mean I just don't quite
25 understand the point of presenting a

1 hypothetical example of what you haven't done
2 to supposedly explain the proc--

3 **DR. NETON:** I think this was -- this was
4 presented in the original SEC -- and we're
5 getting more into the SEC petition evaluation,
6 but in the original SEC petition, when we got
7 to the 1946 through '48 time frame -- '47, '48
8 time frame -- we had monitoring data, but we
9 didn't have a good handle -- there weren't
10 sufficient monitoring data to bounce one
11 against the other to validate that the data
12 seemed appropriate. So it's our contention
13 that in this time frame we do have sufficient
14 data to do that. You're right, we have not
15 done the analysis yet. I can say that we don't
16 expect this to be the case -- I don't want to
17 prejudge, but it appears from what we've seen
18 so far, there's not been a detailed statistical
19 analysis done, but from looking at the data,
20 they appear consistent in the profile such that
21 the intake per year based on urine data -- and
22 it's in the profile, you can look at it -- and
23 the intake per year based on the air monitoring
24 data appear to be very consistent. I didn't
25 want to show up here with a very incomplete

1 statistical analysis, so I -- I've just
2 presented what -- what we will do with the --
3 with the analysis.

4 **DR. MELIUS:** With all due respect, I mean I
5 just -- I mean it's very sort of misleading and
6 confusing. I mean you either present the real
7 data and let us evaluate it or don't present
8 anything -- or leave it to the petition review
9 -- evaluation review tomorrow, but I just -- I
10 don't see what purpose this serves.

11 **DR. ZIEMER:** Okay, thank you. Other comments
12 or questions?

13 **PRESENTATION BY SC&A**

14 Thank you, Jim. Then we'll proceed with the
15 presentation by our contractor, SCA. Board
16 members should have actually received that
17 report -- well, you had the slides. The report
18 itself was distributed earlier, some -- many
19 that -- do we have the over-- the overheads?

20 **DR. WADE:** Yes, we have. They've been
21 distributed.

22 **DR. ZIEMER:** Okay. Dr. Makhijani is going to
23 make the presentation. Arjun, are you set to
24 go?

25 **DR. MAKHIJANI:** Mr. Chairman, members of the

1 Board, may I ask Dr. Neton a question --

2 **DR. ZIEMER:** Of course.

3 **DR. MAKHIJANI:** -- about one of the charts?

4 Dr. Neton, in the urinalysis -- in the chart
5 where you had number of workers and number of
6 urinalysis, were -- were those numbers of
7 urinalyses per year or -- I didn't --

8 **DR. NETON:** No, I believe they were individual
9 urinaly--

10 **DR. MAKHIJANI:** Oh, they were individuals who
11 were monitored, so we can --

12 **DR. NETON:** No, no, they were individual
13 samples, I believe.

14 **DR. MAKHIJANI:** They were the number of samples
15 and not the number of workers --

16 **DR. NETON:** Wait, wait, wait, wait --

17 **DR. MAKHIJANI:** -- who were monitored.

18 **DR. NETON:** -- I need to look at the slide
19 again.

20 **DR. MAKHIJANI:** Okay. It's -- it's --

21 **DR. NETON:** It's been a long day and I
22 apologize.

23 **DR. MAKHIJANI:** It's this one (indicating).

24 **DR. NETON:** No, this is the number monitored,
25 not the number of samples.

1 **DR. MAKHIJANI:** Okay. Thank you.

2 **DR. NETON:** That's correct, because there are
3 many more samples than that.

4 **DR. MAKHIJANI:** Okay. Thanks. I'm sorry, I
5 was just -- I needed that clarification.
6 We prepared this with my colleague, Tom Bell,
7 who's not here. The background to this is --
8 this is the supplemental review -- if I could
9 have the next slide -- of Revision 01. We gave
10 you the review of Revision -- of the basic
11 document, of Revision 0 in your St. Louis
12 meeting in February. You know about the
13 downtown site so I won't -- won't go over what
14 Dr. Neton went through already. Next slide,
15 please.

16 We -- the background to this review is we began
17 reviewing this shortly after the site profile
18 was published, according to the direction of
19 the Board. That was about in mid-March. We
20 were asked to provide an early draft so we
21 could get some feedback from the subcommittee
22 and from NIOSH, which we did on the 5th of
23 April.

24 We provided the version you have for the full
25 Board on April 18th. Since we were doing this

1 calculated the 95 percentile -- 95 percent
2 upper confidence limit for the average of what
3 the worker would experience.

4 Now normally that might not deviate a lot from
5 the actual straight -- straight average,
6 lognormal average. However, in this case,
7 because we have very few measurements -- as you
8 can see, for the mixing we have only three air
9 measurements -- you cannot actually develop a
10 very good statistical distribution so you have
11 to make allowance for the fact of the small
12 number of measurements, and because of the
13 small number of measurements, when you calcu--
14 and the higher spread in the air
15 concentrations, just the uncertainty for the
16 mixing operation leads to a total intake that
17 is two -- nearly two and a half times, two --
18 2.4 times the time-weighted average intake. So
19 you can see the uncertainty makes an enormous
20 amount of difference.

21 In some operations, like the lunch room or the
22 locker room and so on, the uncertainty doesn't
23 make a lot of difference 'cause the air
24 concentrations are quite low. But if you take
25 the uncertainty in the air concentrations when

1 the furnace is operating, that itself leads to
2 a total -- by -- alone, one uncertainty alone
3 leads to a total intake which is 3.4 times at
4 the 95 percentile upper confidence limit than
5 this great average. So it's very essential to
6 actually compute the 95 percentile -- 95
7 percent upper confidence limit in order to
8 resolve these uncertainties in a claimant-
9 favorable way. Unfortunately it turns out that
10 when you have a small number of measurements,
11 this is not an easy thing to do, so we didn't
12 try to -- you know, we didn't have the time
13 actually to develop a full methodology. And in
14 any case, this may be beyond our charge, but we
15 did try to do some illustrative calculations as
16 to why this is essential, and -- and we're glad
17 that NIOSH is -- is looking into it. Next
18 slide, please. Next slide.

19 I think I've gone over this one, so we can --
20 essentially the -- the -- it's very important
21 to -- can you go back? Maybe I didn't go over
22 it well enough. Thank you, Kathy.

23 So it -- the basic recommendation remains the
24 same from before, that it is very important to
25 develop these uncertainties. The one

1 difficulty that I'd like to point out in this
2 context is that there are some special
3 difficulties that arise in relation to survivor
4 claimants. As I mentioned in the context of
5 Iowa, as well, this is -- because when you need
6 the job descriptions, often the families may
7 not have the detailed job description and the
8 job histories so you -- coworker data and
9 interviews are absolutely essential, and -- and
10 as far as we understood from the task three
11 report, coworker interviews have rarely been
12 conducted. As of January I believe 12 in the
13 whole nuclear weapons complex from the
14 applications that have been evaluated. Next
15 slide, please.

16 We evaluated the proposed method for
17 calculating doses from blowouts. That is when
18 -- when this reduction takes place, because
19 it's an exothermic reaction, it liberates heat.
20 In going from uranium tetrafluoride to metal,
21 it happens very suddenly. It's already a very
22 high temperature. This kind of accident was
23 not only common at Mallinckrodt, it also
24 occurred at Fernald and it -- not only in the
25 beginning of the operation. This -- this was -

1 - this was a continuing difficulty.
2 NIOSH has proposed a method in that they've
3 said that they can -- they can go to the first
4 day after the urinalysis and assume that the
5 blowout happened then and produce a claimant-
6 favorable way of actually calculating that.
7 And of course if there were just one blowout
8 and no other exposures of any other solubility
9 type than the single solubility type of uranium
10 tetrafluoride, you could actually do the
11 calculation in this way, provided the
12 urinalyses were frequent enough. So there are
13 a lot of provisos in this. So theoretically
14 it's not an implausible approach, but can it be
15 applied to the situation of Mallinckrodt.
16 The blowouts were -- did happen fairly
17 frequently. I don't know what is the frequency
18 of the blowout but certainly in some periods
19 they would have happened more than once every
20 three or six months, which is the frequency of
21 urinalysis. So you have the question of what
22 happens if you have multiple blowouts.
23 Blowouts were not -- also were not the only
24 type of accident. You also had uranium fires
25 and that would generate some amount of type S

1 material, which is insoluble material, and so
2 you'd have inhalation of insoluble material
3 from incidents mixed up with type M material,
4 which is more soluble, and the urinalysis data
5 would be quite hard to interpret.

6 Another problem is that the main intake is
7 uranium tetrafluoride. Then you have most of
8 the material that has been excreted rather
9 rapidly in days and weeks, and what remains
10 over a long period of time is a small amount of
11 the uranium that would be deposited in the
12 bone. And then you have very slow excretion
13 from that that doesn't look that different from
14 type S material. So the interpretation of this
15 urine data in terms of actually relating it to
16 blowouts would seem to be extremely difficult,
17 even if you knew the dates of the blowouts and
18 the frequency of the blowouts. That would be
19 maybe possible to establish for employee
20 claimants if they remembered when the blowouts
21 would be. That's also a long time, but at
22 least more plausible. I think it would be very
23 questionable or very difficult, at least, in
24 the case of survivor claimants because I can't
25 imagine any way that the survivor claimants

1 would be able to provide data on what might
2 have happened in regard to incidents.
3 And so while the question -- the method
4 proposed is, on its face, theoretically
5 plausible, the number of difficulties for
6 actually applying this to a practical dose
7 reconstruction and -- and Dr. Neton pointed out
8 that the TBD has to be interpreted in the
9 context of actual dose reconstruction, but Dr.
10 Neton, correct me if I'm wrong, I don't believe
11 that an actual method has been developed for --
12 for a -- for this in terms of applying to any
13 dose reconstruction. Am I right about that?
14 **DR. NETON:** Not exactly.
15 **DR. MAKHIJANI:** Okay.
16 **DR. NETON:** This is a --
17 **DR. MAKHIJANI:** That's what I understood.
18 **DR. NETON:** This is a standard technique that
19 one uses to bracket the dose --
20 **DR. MAKHIJANI:** Okay.
21 **DR. NETON:** -- from an intake --
22 **DR. MAKHIJANI:** Well, yeah -- so --
23 **DR. NETON:** -- and I just do want to say that
24 it's irrelevant whether there are multiple
25 blowouts or not --

1 **DR. MAKHIJANI:** Okay.

2 **DR. NETON:** -- the -- if the urine sample
3 represents a time interval of the exposure to
4 the person --

5 **DR. MAKHIJANI:** Right.

6 **DR. NETON:** -- from the date of the incident or
7 any -- from the previous sample to the current.
8 So whether there's three or four or ten
9 blowouts in that time period does not really
10 come into play here. That's not correct, what
11 you stated.

12 **DR. MAKHIJANI:** Well, as I -- as I pointed out,
13 in order to separate the various classes of
14 material, if you're going to have a urinalysis
15 that's very infrequent, it's very difficult to
16 actually separate the intake from type M
17 material and type S material. And because
18 there's intakes of type S material, both from
19 incidents and -- and routine intakes, actually
20 coming up with a method for a claimant-
21 favorable calculation that could be done, would
22 in my -- in our opinion be -- be rather
23 difficult, and I think the applicability -- as
24 I've said, this method is theoretically
25 plausible. It's not an incorrect method. This

1 can be applied to generate numbers. Whether it
2 can be applied to generate numbers in the case
3 of -- of Mallinckrodt with the frequency of
4 data that exists and the variety of
5 solubilities that were taken in by workers is -
6 - is questionable at the present time, in our
7 view, and we would like to see the actual
8 application of this to the circumstance --
9 circumstances of Mallinckrodt, especially as --
10 if six-month samples or annual samples, three
11 months at best, is -- was the state of
12 bioassay, then it would be complex. Next
13 slide, please.

14 The external dose, the -- I gave an example of
15 a situation where there's a lack of adequate
16 shielding, and the question arises, as it did
17 in Iowa -- you know, where the pits are close
18 to the pelvic area and the badges were worn on
19 the collar or the pocket -- there's a question
20 of the organs that are being exposed. And
21 there's a fair -- very good discussion in the
22 TBD about installing shielding around digester
23 tanks during pitchblende processing, and the
24 question has arisen as to whether the film
25 badge data would adequately capture the

1 geometry of the exposure, and we do think that
2 NIOSH needs to characterize the geometry of the
3 exposure -- this would not apply to all
4 workers. They'd apply to the specific workers
5 who were involved in pitchblende processing and
6 in those particular digester tank areas. There
7 would be other areas where similar geometry
8 issues may arise and we have not had the chance
9 to do full evaluation.

10 In our review of Revision 0 we'd also raised
11 some questions in regard to the interpretation
12 of film badge data, the two-element film
13 badges. NIOSH has provided more information on
14 these film badges, but we just have not had the
15 time to actually finish our analysis as to what
16 we would recommend regarding the interpretation
17 of film badge data and what needs to be done to
18 properly interpret it. This would be something
19 that Dr. Behling would have attended to. And
20 as you know, it's just been a pretty crushing
21 amount of work to do and we didn't want to
22 prematurely say something and then not be on
23 the mark. So that's why that -- that -- that
24 piece of work is unfortunately not -- not yet
25 complete. Next slide, please.

1 Tom Bell and I did a brief review of the
2 documents. I made some notes on some of these
3 documents, and Tom did, too. I -- so I decided
4 to make a little bit of a slide. NIOSH has
5 said that much of the data is captured in the
6 existing TBD. Some of the data from 1953 to
7 '58 are not captured and are going to be put in
8 the revision of the site profile, so we did
9 this brief review.

10 I was able to confirm that some of the data I
11 looked at were in the TBD. Please bear in mind
12 it's very difficult to actually go through this
13 data, which is raw -- raw -- quite a bit of raw
14 data and relate it to what's in the TBD, which
15 are a lot of average data -- averages with
16 geometric standard deviations, intake
17 calculations and so forth, so it's not a
18 straightforward matter to actually make sure
19 that this -- these data are incorporated.

20 I looked at some of the external dose data --
21 now this would be useful only for surrogate
22 data. If you have of course external dose data
23 for a worker that are complete, then -- then
24 some of these issues don't -- don't enter. But
25 Table 33 on external dose does not have 1949 to

1 1952 data and including 1949 to 1952 data that
2 are in these boxes, and I've been able to
3 identify a couple of documents in this regard.
4 And NIOSH has noted that some of -- the '53 to
5 '57 documents are not yet incorporated. But
6 one of the things that struck me in this review
7 was that in the external dose data in this
8 period there were a number of documents that
9 actually only listed the job categories for the
10 high exposures, above 200 or 300 millirep for a
11 two-week period. So it's not clear how you can
12 actually use this to marry it with job category
13 data in order to come up with an actual profile
14 of a particular job category in relation to the
15 external doses. For some -- for some badge
16 periods there are no job category data because
17 all were below 300 milliroentgen in the badge
18 readings. The -- so the job categories are
19 there only for a small proportion of the data
20 in the documents that I reviewed and I did
21 review several of them. These documents are
22 typically like 80, 90, 100, 100-plus pages.
23 I reviewed a document in relation to radon.
24 The last but one bullet, I'm sorry, has a typo.
25 It says Table 26. It should say Table 25 of

1 the site profile, it's not Table 26. I
2 apologize for the error.
3 I tried to compare this document with Table 25
4 for this particular -- this document relates to
5 radon in the cloth storage room. I've given
6 you the document number. I found that the site
7 profile had actually averaged a number of
8 different places in this general area. The --
9 the average given in the site profile is seven
10 picocuries per liter, .07 time ten to the minus
11 ten. The average for a five-month period from
12 August 1st to December in this document was
13 given as 0.5 times ten to the minus ten, or
14 about seven times the average, but only for the
15 cloth storage room. And this raised a question
16 in my mind as to how the averaging of radon
17 data is being done and whether we know which
18 specific workers spent how much time in which
19 of these areas. Now this is just one line item
20 in the site profile that reads
21 Feinc/Filter/Cloth Storage Room in Niagara C-3*
22 and so on, and so it seems to be an aggregate
23 of datapoints into a single average with a very
24 large geometric standard deviation of 5.8. And
25 then I could not exactly match it up with this

1 -- it may be inclusive or not inclusive -- it
2 certainly raised a question in my mind as to
3 how these averages in the site profile are
4 being used and whether they are claimant-
5 favorable. We just did not have time to go
6 through the very large amount of air
7 concentration data to do an evaluation.
8 Let me sum up for you -- next slide, please.
9 The -- we've already dealt with the early dose
10 question, so I think we have some resolution
11 there. There have been many improvements and
12 much added data in Revision 01 of the site
13 profile. We still believe -- SC&A still
14 believes that there are a significant number of
15 issues of varying difficulty that remain to be
16 resolved before dose reconstruction other than
17 a minimum dose can be done for the 1949 to 1957
18 period in a reliable way. I'll just tick off
19 some of those points for you.
20 The question of the integrity of the data on
21 dose reconstruction does need to be resolved, a
22 hypothetical example notwithstanding. We raise
23 this question not in the context of the SEC and
24 any legal interpretation. I have come across
25 issues of fabricated data in the nuclear

1 weapons complex in other contexts, and
2 sometimes data that has no basis, numbers that
3 are made up, has a significant effect. And
4 sometimes when you evaluate them they don't
5 have a significant effect, but you -- on -- on
6 the total result, but you do have to make a
7 thorough technical evaluation of the issue with
8 the information at hand in order to be
9 confident that the numbers you're coming up for
10 exposures or releases, as the case may be, are
11 -- are reliable or bounding, depending on what
12 kind of calculation you're trying to do. So
13 that's -- that's a piece of work that really
14 remains to be done from the point of view of
15 dose reconstruction.

16 We don't believe that the data for -- for
17 incident dose reconstruction is as yet adequate
18 in terms of the frequency of incidents and the
19 mixtures of the various types of incidents.

20 The question of the Mallinckrodt versus the AEC
21 data has been addressed for one datapoint only
22 but not in general.

23 There are a number of issues that I've alluded
24 to in regard to survivor claimants that are
25 really very important, given that this is a

1 site at which production work stopped in '57
2 and there are a number of employees who are --
3 who have passed away. So the question of
4 coworker information and job-specific
5 information and how all the surrogate data are
6 to be applied is extremely important. And
7 unless it is resolved, I don't see how those
8 dose reconstructions where surrogate data are
9 needed and job descriptions are not easily
10 available, not in the worker record, would --
11 would be available. Of course if they are
12 detailed in the worker record this would be --
13 this would be a different matter, but it's a
14 matter that needs to be explicitly addressed.
15 It's mentioned in passing in the report, but I
16 just wanted to call it to your attention that -
17 - that the site profile does contain some
18 discussion of -- of quality problems with
19 respect to the bioassay data, at least until
20 1951. I've cited the pages for you. It is
21 worthy of review, partly because we did not
22 find how -- how these quality data are resolved
23 in terms of actual dose reconstructions. And
24 as I said, we haven't had -- had the benefit of
25 actually reviewing dose reconstructions so I

1 don't know if they are addressed well or not.
2 There are still some specific issues, like
3 sperry cake, whose intake potential needs to be
4 addressed. We don't have the position that it
5 was a big or not a big dose. All -- but we do
6 believe that the intake potential from sperry
7 cakes, given the specific radionuclides
8 involved, does need to be addressed.
9 There needs to be a statistical approach to
10 cohort definition.
11 And a time-weighting method that is claimant-
12 favorable needs to be developed.
13 The report also contains some discussion of
14 large particle ingestion which needs to be
15 addressed. Thank you.

16 **DR. ZIEMER:** Thank you very much. We have a
17 little time for questions. Let me begin and
18 I'd like to ask maybe both Jim and Arjun to
19 help clarify for me this issue on the bioassay.
20 My understanding, if you had -- let's say you
21 had two bioassay samples, one three months ago,
22 and let's say there was nothing there. And now
23 we find something. And let's assume there were
24 several blowouts in the middle -- or in between
25 sometime -- it was my understanding that what

1 NIOSH would do would be to assume the --
2 probably the longest time interval that that
3 intake occurred, for example, the next day
4 after the clean bioassay, so that there was the
5 longest chance for the excretion to get you
6 down to where you find the sample, say three
7 months later, and that you would select the
8 worst solubility class that would deliver the
9 highest dose. Am I understanding that
10 correctly?

11 **DR. NETON:** That's correct, we would pick the
12 excretion curve that maximized the dose between
13 those two samples and over-arched any -- you
14 know, any --

15 **MR. GRIFFON:** I think --

16 **DR. NETON:** -- (unintelligible) the exposure.

17 **MR. GRIFFON:** I think you'd actually pick the -
18 - if I can clarify quick-- you'd pick the worst
19 solubility class --

20 **DR. NETON:** Yeah.

21 **MR. GRIFFON:** -- that would define the highest
22 intake, and then you might apply a different --

23 **DR. NETON:** Well, you've got to be careful --

24 **MR. GRIFFON:** -- solubility class to dose
25 estimates?

1 **DR. NETON:** Yeah, you've got to be careful.
2 You do a mixture of both. You find the highest
3 intake and then use the --

4 **MR. GRIFFON:** I don't want to confuse people
5 (unintelligible).

6 **DR. NETON:** You need to do it both ways, based
7 on solu-- the two different solubility classes
8 that may be relevant, because you may get a
9 higher intake for a radionuclide -- a
10 solubility class that gives you a lower dose
11 per unit intake, but the intake is much higher,
12 that's what you would assume. So we do this
13 both ways. We're very -- we do this routinely
14 as part of our program. This is not something
15 new that we're adding to the Mallinckrodt
16 evaluations.

17 **DR. ZIEMER:** I wanted to make sure I understood
18 that because I wasn't quite clear whether --
19 how important it was to know exactly when
20 blowouts occurred, if in fact you could bracket
21 with a maximizing kind of claimant-friendly
22 approach to --

23 **DR. NETON:** Right.

24 **DR. ZIEMER:** -- to gaining what would have to
25 be the maximum intake.

1 **DR. NETON:** Correct.

2 **DR. MAKHIJANI:** Well, Dr. Ziemer, if -- if you
3 were only talking about one type of intake and
4 one type of solubility, this would not be an
5 issue, as I indicated.

6 **DR. ZIEMER:** Well, in fact that's what I'm
7 trying to get some additional clarity on. Even
8 if there were multiple solubilities, would this
9 address that issue?

10 **DR. NETON:** Yes, it would. I mean you would --
11 you would overestimate the dose -- you know, it
12 doesn't matter if you over-- if you --
13 overestimating techniques, you're going to have
14 an overestimate of the dose. If you pick the
15 worst solubility class and estimate it, that's
16 -- you'll end up with the highest estimate of
17 the --

18 **DR. MAKHIJANI:** Am I to understand you're going
19 to apply a -- a class S or a class M, a type S
20 or a type M to the urinalysis interpretation
21 depending on how long an interval you have,
22 because --

23 **DR. NETON:** No.

24 **DR. MAKHIJANI:** -- some of it will depend on
25 that. When you have continuous -- when you

1 have continuous intakes, there is no ambiguity
2 that when you're going back from urinalysis to
3 say air concentrations and intake that you
4 would use generally type S 'cause you would get
5 -- you know, you would get the lowest excretion
6 rate and so on. When you have -- when you have
7 incident intakes it does matter when you do the
8 urinalysis relative to the intake and what the
9 solu-- what solubility assis-- assumption will
10 actually maximize your intake. The interval is
11 important in that case, so it's not actually a
12 straightforward matter to say that you're
13 simply going to assume it on the next day or
14 the frequency of blowouts doesn't matter,
15 because if you do the calculations, the -- for
16 incidents, the interval is important.
17 The second point is that blowouts don't -- are
18 not pure in terms of solubility because you do
19 have metal particles that would be blown out
20 and that would oxidize along with uranium
21 tetrafluoride. And then you have UO₂ in the
22 site, as well as uranium chip fires, so we
23 would -- we're not saying it's not possible to
24 do this. We're -- all we're saying is that the
25 data and methodological development as

1 presented in the supplement is plausible, but
2 not sufficient, in our view, to actually carry
3 out -- carry out a practical dose
4 reconstruction. We'd like to see that.

5 **DR. ZIEMER:** Yes, Dick Toohey.

6 **DR. TOOHEY:** Yes, I'd like to add some things
7 Dr. Neton said and hopefully clarify it,
8 although I'll probably muddy the waters a bit.
9 The procedure we're talking about in this is
10 assuming what the date of the intake could have
11 been, the day after the last clean sample, and
12 what the solubility class may have been, is
13 what we routinely do for internal dose
14 assessment for all cases where we are analyzing
15 positive bioassay data. And we use the IMBA
16 software to run a number of all plausible
17 scenarios regarding intake dates and solubility
18 classes, and we do not -- we are not interested
19 in necessarily maximizing the intake. What we
20 do do is find the intake pattern that fits the
21 observed data and maximizes the dose to the
22 organ for which we are calculating dose.
23 Because if that organ is a metabolic versus --
24 or lung, say, then obviously type S, which
25 stays in the lung, will be more claimant-

1 favorable. If it's a metabolic organ, then a
2 more soluble material is more favorable and the
3 exact -- we don't know a priori, unless there's
4 very good air monitoring data that we can pin
5 the date down to, when that intake occurred or
6 what the chemical form of the material was. So
7 we look at all plausible scenarios with IMBA to
8 calculate the most claimant-favorable dose.
9 So really the objections you are raising are --
10 are just not relevant. We handle every
11 internal dose assessment the same way.

12 **DR. ZIEMER:** Thank you.

13 **DR. MAKHIJANI:** I do -- we do have some
14 questions because if -- if you handle all
15 internal dose assessments in the same way, we
16 first of all said that in the specific case of
17 Mallinckrodt the use of type M solubility was
18 mentioned in Revision 0 and that this needed to
19 be changed. It wasn't changed and -- but
20 you've now agreed that this -- this -- this --
21 this is being done. It was not clear -- to us,
22 anyway -- that in going back from urinalysis to
23 intakes and to organs that the most favorable
24 solubility assumptions are actually being used.

25 **DR. NETON:** I think that was a

1 misinterpretation of Table 28 that lists type M
2 material as an example, because we believe as a
3 dose reconstructor that would be the most
4 commonly encountered form of uranium in certain
5 areas. But clearly in the earlier part of
6 section six it lists the default -- default
7 classes to be used for different solubilities --
8 -- you know, different work place exposure
9 conditions, and they're not all type M, so --
10 **DR. MAKHIJANI:** Yeah, and we -- this is -- this
11 is clearly a matter -- I mean maybe it is a
12 matter that we need to understand with further
13 discussion. My understanding of the listing of
14 the solubility tables, and I did look at those
15 in the site profile, was that those applied to
16 air intakes. And we do agree that when you're
17 considering the intakes that there are gui--
18 that there is guidance in the TBD for the dose
19 reconstructor to use the proper solu-- so I
20 don't have a question about that. We -- and we
21 did not raise a question about that earlier on
22 because I do think we understood you properly.
23 **DR. NETON:** Right.
24 **DR. MAKHIJANI:** We did -- we did raise a
25 question that in going back from urinalysis and

1 calculating an air concentration and air intake
2 that would be -- an intake by the inhalation
3 pathway, that -- that there did not seem to be
4 a specific guidance and methodology to assume a
5 more -- the most claimant-favorable solubility.

6 **DR. NETON:** Yeah, we'd be more than happy to
7 sit down with you -- SC&A and discuss this.

8 **DR. ZIEMER:** Yeah, I think this methodology had
9 been explained to the Board in the past, I --
10 at least that's the way I understood it. And
11 Mark, I think you've confirmed that that was
12 the case, yes. Richard?

13 **DR. TOOHEY:** I'd also like to add another
14 comment on the issue of burns, whether chemical
15 or thermal, in accidents and scenarios.
16 There's a vast amount of literature in
17 radiation accident management that shows that
18 even burned skin is still a pretty good barrier
19 against transdermal absorption. In terms of
20 imbedded shrapnel, metallic particles in a
21 blowout, for example, there's also now a lot of
22 data available on Gulf War veterans who have
23 imbedded DU shrapnel on what uptake may be and
24 resulting doses from that. And I'm part of an
25 NCRP committee, we're hopefully getting out a

1 final report for Council review on a
2 contaminated (unintelligible) model that can be
3 used, if necessary.

4 **DR. ZIEMER:** Thank you.

5 **DR. MAKHIJANI:** Our point in bringing up many
6 of these issues, just so it is clear as to why
7 they are there -- like the sperry cakes and
8 burns -- NIOSH, in many of its TBDs that we've
9 looked at, does raise issues where doses are
10 just a few millirem. In order to put it to
11 rest, if doses are a few millirem and if it's
12 not an issue and if there is a barrier or
13 sperry cakes are not an issue, these issues
14 have been raised by site experts. I believe
15 it's very important for the credibility of the
16 program that they not be dismissed without an
17 analysis being put --

18 **DR. ZIEMER:** Very good.

19 **DR. MAKHIJANI:** -- on the table.

20 **DR. ZIEMER:** You're quite right.

21 **DR. MAKHIJANI:** That's the point.

22 **DR. ZIEMER:** Yes, Dr. Melius.

23 **DR. MELIUS:** Yeah, in our last meeting there
24 was a -- some -- a long discussion and issues
25 raised about newly-discovered boxes of data,

1 and I noticed in your report, Arjun, that --
2 and it may be for NIOSH to answer this, but
3 under your review of the five to six boxes that
4 NIOSH has stated that '53 to '58 data are not
5 captured and will be put in the next revision
6 of the TBD. Given our experiences with
7 Mallinckrodt last time and Iowa, I'd like some
8 explanation of that. It may be
9 straightforward, but -- what do you mean by not
10 captured and then --

11 **DR. NETON:** That they have not been considered
12 in -- in the Revision 1 that has been issued.
13 They were not available at the time Revision 1
14 was done. I'd remind the Board, the history
15 behind this is that we were very close to
16 issuing Revision 1 when Mallin-- when -- when
17 the Revision 0 review came out and we committed
18 to getting Revision 1 out as soon as possible,
19 and that did not allow us sufficient time to
20 review all of those boxes and incorporate them,
21 although we're moving as quickly as we can to
22 incorporate those data and put out, you know,
23 the revision -- if necessary. It may end up
24 being that those data are not as useful as we
25 might think, I don't know. I have not looked

1 at the data myself.

2 **DR. MELIUS:** Thanks for the clarification.

3 **DR. ZIEMER:** Yes, Mark.

4 **MR. GRIFFON:** I got -- I have a -- a few
5 questions and -- and perhaps some -- maybe
6 ideas for reading for tonight for the Board,
7 certain areas of interest in the -- in the 250-
8 page TBD, can narrow it down a little maybe. I
9 -- Table 13, this might be a question more for
10 -- for Jim, is -- I think it's one of --

11 **DR. ZIEMER:** This is TBD Rev. 1 is --

12 **MR. GRIFFON:** Yes, page 195, if people have it
13 -- measured daily weighted average exposure
14 concentrations. Can you give me a sense -- it
15 may be in this -- this report, it probably is
16 somewhere, I mean it's a very volumous (sic)
17 report. Can you give me a sense of the
18 weighted average concentrations, what -- what
19 is the -- sort of the end in this equation?
20 How many samples were used to derive these
21 weighted averages? I'm sure it varies, but is
22 that in this report somewhere?

23 **DR. NETON:** I believe so, but I can't -- I
24 can't tell you that off the top of my head.
25 It's a pretty large report and --

1 **MR. GRIFFON:** Yeah, yeah.

2 **DR. NETON:** -- I was not the principal author,
3 but --

4 **MR. GRIFFON:** Okay, if you -- if you --

5 **DR. NETON:** -- I can certainly get that
6 information for you.

7 **MR. GRIFFON:** Right. That's fine.

8 **DR. MAKHIJANI:** I don't believe that -- Dr.
9 (sic) Griffon, I don't believe that the
10 detailed data are actually -- in terms of the
11 number of samples, are in the site profile.
12 They are in the underlying documents that are
13 available on the database, which is -- I
14 pointed you to the -- to the table in our
15 report on page 28, which is where that table is
16 drawn from and -- and as you can see, the
17 number of samples for each work -- work -- task
18 is generally quite limited. I've looked at
19 numbers of these, and they're typically two,
20 three, four samples, sometimes only one sample.
21 Of course when you have one sample, you can't
22 do anything with that statistically. And --
23 and that would -- I haven't looked at all the
24 data, of course, but that would be fairly
25 typical, and you can't actually join all these

1 datapoints into one distribution because --
2 because each task has its own characteristic
3 probability distribution for air concentrations
4 that has to be characterized. That's why
5 actually this is somewhat a complex task to --

6 **DR. NETON:** Right.

7 **MR. GRIFFON:** I guess --

8 **DR. MAKHIJANI:** -- come up with a --

9 **DR. NETON:** I'd remind the Board again that
10 this is part of the analysis. This profile
11 does not say use exclusively Table 13, plant
12 six as verbatim and insert six dpm per cubic
13 meter for 1956. It's part of the process of a
14 dose reconstructor putting together the mosaic
15 that is a dose reconstruction. If you have
16 some urine data, you have some plant air data,
17 you may look at other intervening years, but it
18 does not necessarily commit the person to using
19 these individual datapoints. Again, it's part
20 of the toolbox for doing a dose reconstruction,
21 and I still submit that the dose
22 reconstructions themselves would stand alone on
23 their own two feet, using this as their guide.

24 **MR. GRIFFON:** I -- I understand, Jim. I just --
25 -- I think it's important for us to consider the

1 -- the -- there's a -- there's a volume of data
2 here, nobody disputes that. I think we have to
3 consider the quality of the data --

4 **DR. NETON:** Sure.

5 **MR. GRIFFON:** -- and -- and the validity of the
6 data, so that -- that's all I'm after --

7 **DR. NETON:** Absolutely.

8 **MR. GRIFFON:** -- and I'm just using that one
9 table as an example. I just picked one out of
10 --

11 **DR. NETON:** Yeah.

12 **MR. GRIFFON:** -- out of the 35 or whatever.

13 The next question or -- and along those lines,
14 just on the Table 13, I guess sort of what
15 raised my attention to this was if -- if you
16 end up having to use this as part of your
17 reconstruction, if you don't have your end data
18 and you end up having to use this to estimate
19 intakes, you know, it -- it just -- what raised
20 my question about the number of samples was
21 there was a high degree of variability, at
22 least in some of these jobs, from sample to
23 sample, from -- from weighted average point to
24 weighted average point.

25 For instance, pilot plant technician, 1,940 in

1 '56 and then 9.2 in '54 makes me wonder if
2 that's, you know, production related or, you
3 know --

4 **DR. NETON:** Sure, and I think you'd find -- and
5 maybe this is one of these profiles that
6 certainly would benefit from a user's guide.
7 You know, we talked about user's guides in
8 these things to assemble these so that one can
9 understand a little better how they would be
10 applied in the field. But I think if you see
11 our past practice, more than likely --
12 depending on the type of cancer that was being
13 -- the organ that was being reconstructed --
14 one may go and find the highest dataset among
15 all of those and use that in the dose
16 reconstruction to demonstrate that the
17 probability of causation is less than 50
18 percent.

19 So again, they're not -- this is not
20 instructing one to use these individual
21 datapoints where the N equals three or five or
22 one or whatever. It's to give them a sense for
23 the relative magnitude and the distribution, as
24 you pointed out, and -- and use it in that
25 context. So I guess it's very difficult for me

1 to sit here and say, you know -- to answer your
2 question. This is --

3 **MR. GRIFFON:** Yeah -- no, no, I know --

4 **DR. NETON:** -- this is insufficient in and of
5 itself. It's a compilation of all the
6 available data at the site, but it -- it's part
7 of a -- the toolbox for dose reconstructing.

8 **MR. GRIFFON:** I guess my -- my next, and maybe
9 my last, I know it's getting late in the day
10 here, question -- the -- the urinalysis data
11 that you're using, is it CEDR database or -- or
12 a -- a non-Privacy Act --

13 **DR. NETON:** It's CER database --

14 **MR. GRIFFON:** CER database.

15 **DR. NETON:** -- Center for Epidemiological
16 Research, not CEDR, so it is identified --

17 **MR. GRIFFON:** CER database, right, it's --

18 **DR. NETON:** Yeah, this is not off the --

19 **MR. GRIFFON:** -- just has the names in it
20 instead of the de-identified version --

21 **DR. NETON:** Correct.

22 **MR. GRIFFON:** -- CEDR. Right?

23 **DR. NETON:** Right, I'm not sure that -- I'm not
24 -- this is -- may be on CEDR, as well, I don't
25 know, but --

1 **MR. GRIFFON:** It is, it is, yes.

2 **DR. NETON:** Okay, but this is the original
3 ORAU-obtained data for their epidemiological --

4 **MR. GRIFFON:** It may -- it might be slightly
5 different.

6 **DR. ZIEMER:** Richard, additional comment?

7 **DR. TOOHEY:** Yeah, just to comment on that.

8 Jim -- Jim's correct, it's the CER data, not
9 the de-identified -- the CEDR, which we found
10 of limited usefulness except for overall
11 (unintelligible) --

12 **MR. GRIFFON:** Because you need the names
13 (unintelligible) of course, yeah.

14 **DR. TOOHEY:** But what we have done is check the
15 names in the CER data from the old epi studies
16 against the claimant rosters. And when we get
17 bioassay data submitted from DOE or whoever --
18 what they claim filed, we compare the two --

19 **MR. GRIFFON:** Okay.

20 **DR. TOOHEY:** -- and see if they jive. If they
21 don't, then we start asking more questions and
22 --

23 **MR. GRIFFON:** So you do -- you do have --

24 **DR. TOOHEY:** -- pull the strings till we get
25 (unintelligible) --

1 **MR. GRIFFON:** -- some raw data that you're
2 using to validate the database data.

3 **DR. TOOHEY:** Yes.

4 **MR. GRIFFON:** Okay. And that -- that -- then
5 the last question, I guess -- and I -- I also
6 agree with this reference, page 77/78 make for
7 some interesting reading. The second paragraph
8 on page 78 says that because of the questions
9 regarding the validity of the samples, the
10 apparent variations in the sample analysis
11 methods, and even who was doing the analysis,
12 the Mallinckrodt urinalysis data should be used
13 with caution, at least when the data were taken
14 from Barnes prior to about 1951.

15 **DR. NETON:** Right, those data would be biased
16 high.

17 **MR. GRIFFON:** And -- and -- well, that's your
18 conclusion.

19 **DR. NETON:** Well --

20 **MR. GRIFFON:** And the previous page --

21 **DR. NETON:** -- what the records shows, but --

22 **MR. GRIFFON:** Okay.

23 **DR. NETON:** -- that was the problem with the
24 Barnes data is their calibration values were
25 low due to precipitation of the uranium out of

1 the standard solutions, so with a low
2 calibration value, the values were increased,
3 so I mean it's in the --

4 **MR. GRIFFON:** I saw some discussion of
5 contaminated blanks, but I -- I don't want to
6 get into the -- you know --

7 **DR. NETON:** Okay.

8 **MR. GRIFFON:** We can discuss that further I
9 guess tomorrow or whatever.

10 **DR. NETON:** Sure.

11 **MR. GRIFFON:** But it also sort of truncates it
12 at '51, but on the prior page, page 77, it also
13 says it is not clear who did the urinalyses
14 from '50 to '54. So I -- I guess -- you know,
15 some of -- some of these questions --

16 **DR. NETON:** Yeah.

17 **MR. GRIFFON:** It just raises the question of
18 are these -- are these data valid in the first
19 place. I mean there's -- there's a lot of it,
20 for sure. It does raise the question of
21 validity.

22 **DR. NETON:** Sure.

23 **MR. GRIFFON:** So...

24 **DR. ZIEMER:** Thank you. Jim Melius.

25 **DR. MELIUS:** Just one brief comment along those

1 lines. You can sit down, Jim. This is a
2 comment. We've been giving you a workout here
3 back and forth, but -- but it refers back to
4 actually a comment that Jim made earlier.
5 With the Iowa site profile and petition we were
6 trying to determine whether -- basically
7 whether the model was allowing the calculation
8 of -- or dose reconstruction with sufficient
9 accuracy -- put it simplistically. And in this
10 case with Mallinckrodt, we're weighing a site
11 profile that's a toolbox, as you describe it,
12 and as to whether that toolbox allows the
13 reconstruction of a dose with sufficient
14 accuracy, and that's a more difficult task and
15 -- 'cause the problem is you use different
16 tools on different individuals, and we don't
17 necessarily have a good sense -- and maybe you
18 don't, either -- of which tools are going to be
19 most commonly used, as well as -- so all we can
20 really do is sort of look at what is the
21 strength and weaknesses of the various tools in
22 there and figure out which are important tools
23 and -- and -- and then make some sort of
24 overall assessment. And so that's sort of the
25 probing that's going on. I don't think it's

1 necessarily helpful to that probing to say
2 well, this isn't going to be used all the time
3 or this is going to be used -- you know,
4 there's other tools, 'cause we've got to sort
5 of judge each tool and then come to some
6 conclusion as to how we deal with the -- the
7 SEC petition. So I think that's -- I think
8 what Mark was trying to get -- get at,
9 basically -- and I understand it's a long day
10 and it's sort of frustrating, but we sort of
11 have to go through this, I think.

12 **DR. ZIEMER:** Go ahead, Richard, and reply.

13 **DR. TOOHEY:** Okay, if I may make a comment
14 myself. Believe it or not, I agree with you.
15 We -- it's a toolbox, and which tool is
16 appropriate for a given claim is, to some
17 extent, up to the judgment and experience of
18 the dose reconstructor who is doing that dose
19 reconstruction. Presumably they've got
20 experience, they're familiar with bioassay data
21 analysis and all that and they will make the
22 best judgment.

23 I do want to mention, though, that the tools in
24 the site profile are tools intended for
25 individual dose reconstruction, which may be a

1 minimum estimate for a likely compensable, a
2 maximum estimate for a likely non-compensable
3 case, or a best estimate for a case in the
4 middle. Whereas sufficient accuracy, for
5 deciding an SEC petition, is limited to at
6 least putting an upper limit on the dose to
7 each of the 22 organs. And a tool that maybe
8 doesn't quite cut the mustard for a best
9 estimate in one case may be perfectly adequate
10 to put a maximizing limit on an organ dose.

11 **DR. MELIUS:** Yeah.

12 **DR. ZIEMER:** Thank you. Other comments? We
13 are going to resume our discussion on the
14 Mallinckrodt site and related matters tomorrow
15 morning. We also have a public comment period
16 this evening beginning at 7:15, so we will
17 return here at that time.

18 I want to ask if there are any housekeeping
19 issues we need to address -- thank you, Arjun -
20 - any housekeeping issues we need to address
21 before we dismiss?

22 Then we will recess until 7:15. Thank you very
23 much.

24 (Whereupon, a recess was taken from 5:10 p.m.
25 to 7:15 p.m.)

1 **PUBLIC COMMENT**

2 **DR. ZIEMER:** Good evening, everyone. We're
3 going to begin our evening public comment
4 session at this time. The logistics and events
5 of this day probably have impacted on the crowd
6 this evening -- the crowd, or lack of a crowd.
7 But in any event, we will proceed.

8 I'm Paul Ziemer, Chairman of the Advisory Board
9 on Radiation and Worker Health. Ordinarily I
10 spend a bit of time at the beginning of the
11 public comment session talking about the role
12 of the Advisory Board and exactly what we do
13 and that sort of thing. However, for this
14 particular group -- which I suspect tonight
15 largely focuses on St. Louis Mallinckrodt folks
16 and we've been to St. Louis a couple of times
17 and have had public testimony from folks from
18 the Mallinckrodt group. And of course most of
19 the Iowa folks were here earlier and have
20 probably left. But in any event, I think the
21 Mallinckrodt people, the St. Louis people, are
22 quite familiar with the role and operation of
23 this Board so I'm not going to take the time to
24 go through my normal presentation, although
25 there are copies of it for those who may want

1 it. And I think those will be back on the back
2 table, but in any event, we'll proceed just
3 without that this evening, if that's agreeable.
4 I am going to be looking for the sign-up sheet
5 of those who have signed up. I perused it a
6 moment ago. There were not too many names on
7 there, but I think if Tom Horgan is here -- and
8 there's Tom -- and Tom, in just a moment we'll
9 give you the mike and you'll have the
10 opportunity to speak to us, as well.
11 I should point out that if -- if you did wish
12 to speak and didn't have the opportunity to
13 sign the sheet, you'll still have an
14 opportunity, in any event, to address the group
15 if you so wish.
16 Actually the first one on this list here is Dan
17 McKeel. Is Dan here this evening? He was here
18 earlier. And I know that, Board members, Dan
19 has provided us with some material that was
20 passed out earlier, so if Dan isn't here this
21 evening you at least have the material that was
22 distributed by Dan -- and we'll give him
23 another opportunity in a minute.
24 The other thing before I call other speakers is
25 I would like to make sure that everyone here

1 attending is aware of what has transpired so
2 far since our meeting opened yesterday.
3 Earlier today the Advisory Board approved a
4 motion to recommend to the Secretary of Health
5 and Human Services that the Iowa petitioners be
6 designated as a class in the Special Exposure
7 Cohort, and that motion was approved and will
8 proceed on up to the Secretary of Health and
9 Human Services. So I don't know if there --
10 there were some Iowa folks that had signed up
11 to speak tonight, and it may be that they will
12 not feel the need to do so, but I think we do
13 have some Iowa names on the list, as well.
14 We will hear then from Denise Brock, from Tom
15 Horgan, from Dan McKeel -- all representing the
16 petitioners in -- from Mallinckrodt, and I'm
17 sort of looking over here to see who wants to
18 go first, and if -- Denise, if you're prepared
19 to go first --

20 **MS. BROCK:** (Off microphone) (Unintelligible)
21 ready in about 30 seconds.

22 **DR. ZIEMER:** Thirty seconds, okay.

23 **MS. BROCK:** (Off microphone) I'll just wait
24 (unintelligible).

25 **DR. ZIEMER:** Then -- yeah, Tom wants me to tell

1 a few funny stories in the meantime, but we
2 will just momentarily hear from Tom Horgan,
3 representing Senator Bond.

4 I do want to just double-check and see if any
5 of these Iowa folks are here. Jane Stonger?
6 Anita Loving? Jim Shelton? E.D. Webb? None
7 of those are here then this evening, and that's
8 understandable. They will have felt that their
9 -- their need was completed already.

10 Dan McKeel, I have already indicated to the
11 Board that we have a document that was made
12 available to us, and I understand that you also
13 will have some additional comments for us this
14 evening, so the Board does have your -- your
15 document, as well.

16 (Pause)

17 Tom Horgan, representing Senator Bond's office.
18 Thank you for being with us tonight.

19 **MR. HORGAN:** I'm going to put this up here
20 because I'm going to have to refer to some
21 notes. But first of all I -- I just want to
22 say that I -- I found the dialogue today
23 between the contractors and NIOSH very
24 stimulating and very informative. And you
25 know, I probably bet you don't get a lot of

1 comments like that at these meetings, but I
2 really did, and so...

3 At any rate, while I was listening to the
4 dialogue today between Mr. (sic) Neton's
5 presentation from OCAS and then followed by Dr.
6 -- let me make sure I get this right --
7 Makhijani's presentation, I noticed a couple of
8 things. And the first thing I wanted to
9 address had to do with Mr. (sic) Neton's
10 presentation.

11 I am a little bit disturbed about one thing in
12 his presentation, and that was the use of a
13 hypothetical model to demonstrate -- and I
14 don't know the specific context. I certainly
15 want Mr. (sic) Neton to come up and, you know,
16 if I misspoke, to -- misspeak, to -- to correct
17 it, but the use of a hypothetical model to
18 determine -- to determine -- and -- and -- I
19 guess I got the feeling to justify the ability
20 to do dose reconstruction.

21 Now a hypothetical model -- and I didn't do
22 well on my SATs, but I think I got this one
23 right, is something that really doesn't exist.
24 It's -- and it's a make-believe example. Now
25 I'm not a scientist, but I have a fairly decent

1 background in social scientific research, after
2 going to graduate school, and I am concerned
3 that Mr. (sic) Neton used a hypothetical model
4 to illustrate the fact that he could do dose
5 reconstruction on claimants who were involved
6 in real incidents and exposures and
7 circumstances.

8 That troubles me. But what troubles me even
9 more is a phrase that Mr. (sic) Neton said in
10 his presentation when he was developing his
11 hypothetical mod-- or explaining his
12 hypothetical model. I think it had to do with
13 numbers, and we could check the transcript.
14 But he said something along the lines, when he
15 was explaining it, that the numbers in the
16 hypomodical (sic) that these numbers he just
17 made up. He just made them up. How can you
18 use a hypothetical model and numbers you just
19 made up to do a dose reconstruction on people
20 with real exposures and real events?

21 Now I don't want to be cynical, but it leads me
22 to question -- as representative of Senator
23 Bond -- has Jim Neton and OCAS -- what else
24 have they just made up to justify dose
25 reconstruction? Is this the only thing? I'm

1 concerned about that and I want the Board to
2 know that concern.

3 Number two, in Arjun -- Arjun's presentation
4 there was a slide that says -- and I believe it
5 was slide 13, brief review of CD with documents
6 from five or six boxes, and it was the first
7 bullet. And specifically I'm referring to the
8 -- the boxes contain a large amount of data.
9 It will take significant effort to verify
10 whether data are adequately captured. NIOSH
11 has stated some 1953 to 1958 data are not
12 captured and will be put in the next revision
13 of the TBD.

14 Well, the next revision of the TBD? And I want
15 to make this clear, and if Mr. (sic) Neton is
16 here, I'd like to ask him. And when he came up
17 with his dialogue, I believe, with Arjun, he
18 said that -- something along the lines -- and I
19 don't -- we'd -- again, we'd have to check the
20 transcripts -- that this will be addressed in
21 our next revision to the site profile. And I
22 guess my question is -- to Jim and Larry at --
23 and the rest of the gang at OCAS, are you
24 planning to revise this TBD again after this
25 meeting in the future? If -- if anybody wants

1 to answer that, they can.

2 **DR. ZIEMER:** Let me make a general comment and
3 then -- and Jim can certainly answer -- all of
4 the site profiles are subject to updating on a
5 regular basis, certainly as a starting point.
6 But Jim, you may wish to address that.

7 **DR. NETON:** Yes, Jim Neton. I think I'll
8 (whereupon, the speaker's microphone failed but
9 the response continued) address the first issue
10 that was raised (unintelligible) -- the first
11 issue (unintelligible).

12 (Pause)

13 (Whereupon, the microphone service was
14 restored.) My lucky day. I'd like to address
15 the first issue raised by Tom. The -- I think
16 the -- I'm not sure of the exact title of the
17 slide, but I thought it was hypothetical
18 example, not model. And I'm sorry for the
19 misunderstanding that I -- I must have given --
20 at least Mr. -- Tom that this was an example
21 that was used or a model that was going to be
22 used to actually make decisions on -- on the
23 data. What I really intended to convey was
24 that this was an example of the approach that
25 is going to be used to validate the individual

1 sets of monitoring data against each other so
2 that we could have some assurance that this
3 data integrity issue was -- was not a major
4 factor in our dose reconstruction. So I do
5 apologize for -- for giving that misinterpre--
6 misimpression, but it is not a model that's
7 going to be used for any dose reconstructions
8 at all. I just used it as an example to -- for
9 timeliness purposes. And I think Dr. Melius
10 already pointed that out after my presentation.
11 The second question related to the Revision 2
12 of the site profile. I indicated that we're
13 under very serious time constraints trying to
14 get Rev. 1 out. The dataset from '53 to '58 we
15 do intend to incorporate. It will be a very
16 short time period for that incorporation, we
17 just did not have time to get it in for this
18 deliberation.

19 I will point out, as Dr. Ziemer indicated, they
20 are -- profiles are meant to be living
21 documents. We use that term a lot but it is
22 very true. We will put in there what we know
23 to be fact as it's available. And more
24 importantly, as it becomes available we will
25 look at every single dose reconstruction that

1 may have been done under the previous version
2 to see what effect that additional data may
3 have on the outcome of the cases. No case is
4 closed under this system. Every time a profile
5 is revised, we go back and evaluate those.

6 **MR. HORGAN:** Well, in terms of the hypothetical
7 model, that's good to know, 'cause I hope we
8 would use real numbers.

9 The second issue -- in response to the second
10 issue, so we -- we -- we have the answer to
11 that question. There is going to be another
12 revision to the site profile.

13 And I've heard -- again, let me remind the
14 Board that we -- this site -- the original site
15 profile was given to us or released 18 months
16 ago. I believe it was October 28th, 2003 at
17 the Adams Mark in St. Louis. We've had Rev. --
18 Rev. 0, Rev. 1 -- I -- I really can't keep
19 track. My point is, though, and I think
20 Senator Bond touched about it on this speech.
21 Now we know they're planning to do another
22 revision of the site profile -- another one.
23 I've just got to ask a question with the intent
24 of the statute and the timeliness, and he said
25 it's going to be short, but how many times -- I

1 want to ask the Board -- does NIOSH need to
2 revise the site profile to get it right?
3 This very well may be a living document. I've
4 heard that a hundred times. While the document
5 is alive and well and maturing after 18 months,
6 there are plenty of Mallinckrodt workers who
7 are dying. And even though it will be a short
8 site profile that -- from what we're told,
9 again, I -- a lot of people don't have a lot of
10 time left. So again, it's a living document
11 after 18 months, but a lot of people are dying.
12 And a lot of people have died within that 18
13 months.
14 Finally -- and I guess if I could leave that,
15 in the earlier discussions today it all comes
16 back to an issue that was discussed in the Iowa
17 site profile, very (unintelligible), an issue
18 of credibility.
19 Finally, today I -- there were a couple of
20 things that were mentioned in the dialogue
21 today regarding the Iowa site profile. On the
22 Iowa site profile I thought I heard Mr. (sic)
23 Ziemer today say, when we were talking about
24 the discussion, that if we had ten years -- and
25 again, let's check the transcript, but if we

1 had ten years we could probably come up with a
2 dose reconstruction for the Iowa sites or
3 something along -- and it was something along
4 the line about smart people can come up with
5 solutions if they have enough time.

6 I don't disagree with that. I think while the
7 situations between Mallinckrodt and Iowa are
8 similar but not identical, I think that I may
9 be -- I can't say for sure, but I may be open
10 to an argument that if we did have ten years we
11 could -- on Mallinckrodt downtown we could
12 maybe come up with a dose reconstruction for
13 all the workers. I've got to remind the Board,
14 though, that we don't have ten years and it's
15 been five years since enactment, so we're
16 almost halfway there.

17 Finally, I also want to remind the Board of
18 something that I thought I heard Dr. Melius
19 touch on today, and I believe Dr. Ziemer said
20 something about it, as well. The Board needs
21 to address the information that they have at
22 hand right now. The cur-- that is the current
23 site profile or TBD, as you have it today, not
24 any new info or site profile that may occur or
25 may develop in the future. What you have

1 today. Just in the same way that I believe
2 this Board acted on the information they had
3 for the site profiles of Mallinckrodt and the -
4 - and the partial cohort from 1942
5 (unintelligible) at the February meeting, and
6 the information they had when they acted on the
7 Iowa site profile at the Mallin-- at the St.
8 Louis meeting at the Adams Mark. That's all I
9 wanted to say and I just wanted to make that
10 aware to you today. Thank you.

11 **DR. ZIEMER:** Thank you, Tom, for your pointed
12 remarks, and please pass on the regards of this
13 Board to Senator Bond, as well.

14 Now let's hear from -- I've got Dan McKeel
15 next, and Dan, if you will approach the mike.

16 **DR. MCKEEL:** Well, good evening to the Board.
17 As Dr. Ziemer said, I hope you all at least
18 have received my more extended comments that
19 really address both the Rev. 1 of the TBD and
20 also have some insights about the SEC petition
21 that you'll be voting on tomorrow, hopefully.
22 So tonight I wanted to go through some related
23 matters, but to make some emphasis points that
24 I think are -- are important. And I -- I am
25 going to try not to go over the same material

1 that's in those extended outlines, but I do
2 have to mention that here we have Rev. 1, a
3 greatly expanded and improved document, no
4 doubt, but still one of the deficiencies that I
5 pointed out in -- both in 2003 and 2005 in St.
6 Louis, is still not corrected. And that is
7 that the second paper that has to do -- peer-
8 reviewed paper that has to do with dust studies
9 at Mallinckrodt, this paper here in the Journal
10 of Epidemiology, 1995, is still not included in
11 the TBD Rev. 1. So it does seem to me that
12 there's some miscommunication between actually
13 the program office at NIOSH and their
14 contractor, and Ms. Westbrook, who's preparing
15 the site profile. So I certainly would hope
16 that that situation has improved.

17 One of the things I'd like to make as a
18 suggestion -- 'cause I think this will come up
19 for many site profiles, and that is that it is
20 impossible to decipher from the Rev. 1 of
21 either Iowa or Mallinckrodt -- to get a good
22 idea of the thoroughness of the search of the
23 available data on those sites. And I think
24 it'd be a great improvement if the Board could
25 at least suggest possibly to NIOSH that when

1 they prepare a site profile there ought to be a
2 explicit statement that says we consider the
3 following available sources. And for instance,
4 for Mallinckrodt there is no information
5 whether, for example, the EPA superfund records
6 center in Kansas City was searched. Was the
7 National Archives, the (unintelligible)
8 archives, were they searched thoroughly, et
9 cetera. And it seems to me that that's
10 extremely important. And as you know, the vote
11 on the SEC 00112-2 that has to do with the '49
12 to '57 Mallinckrodt cohort was delayed -- not
13 exclusively for that reason, but because we had
14 to look and decipher what was in six boxes of
15 new material. So you know, maybe if all that
16 data source work were done up front, then there
17 could be a more systematic review of that
18 material and we wouldn't be turning up with all
19 these documents late in the -- late in the
20 course of an SEC evaluation.

21 And that makes me turn to the analysis that's
22 in the -- of what's in those six boxes. One of
23 the things I was interested in the supplement,
24 in fact, quite fascinated by, was a notation
25 that -- there was one line item that said there

1 were urinary analysis records for -- for
2 plutonium. Now that line item was not dated
3 and it didn't say whether that was explicitly
4 for Mallinckrodt Destrehan Street or for Weldon
5 Spring. But I bring that up because plutonium
6 being present in -- at either of those sites
7 was really not mentioned in the -- certainly
8 not in the Mallinckrodt Rev. 1 TBD, and it
9 seems to me that that's important enough that
10 that should be at least addressed.
11 It implies that the DOE field office report
12 saying that there were some 74,000 metric tons
13 of recycled uranium sent to one of those two
14 sites, or to both, has some validity, even
15 though both sites apparently deny that they
16 received any appreciable recycled uranium. So
17 I would think that that ought to be gone into.
18 The other thing that I would comment about the
19 supplement by NIOSH that they wrote in the
20 review today by SC&A of what was in those boxes
21 on slide 13 was -- my -- my reading of the
22 analysis of what's in those two sets of
23 evaluation of the same boxes is -- is sort of
24 different, NIOSH saying that they -- there were
25 no real surprises that would affect anything,

1 that they had already captured 19 of the 22
2 documents. And I think the slide 13
3 information indicates that SC&A found a lot
4 more information that needs to be digested and
5 that they couldn't even make the evaluation
6 whether the information had been captured in
7 the TBD without further study. So there's sort
8 of a difference there.

9 Anyway, after the February meetings I was
10 interested enough in what was in those six
11 boxes that I enlisted the help of Ted Hisell*
12 and the Missouri Coalition for the Environment
13 Foundation, and we filed on March the 10th a
14 Freedom of Information request where we sought
15 to know what was in those boxes. We wanted a
16 detailed index, and in particular we wanted to
17 address another issue that seems to me to be of
18 widespread importance for many site profiles,
19 and that was -- we had heard that within those
20 six boxes were material that had to be
21 declassified. And so we now have unclassified
22 but formerly classified documents. And the
23 question was, how much more classified material
24 is there about the Mallinckrodt site and I was
25 also interested in the Weldon Spring site, of

1 course. And it seems to me that that's a very
2 important question, not only what was
3 declassified but what is still classified and
4 why it's classified.

5 And it would seem to me that, you know, there
6 could be some information that relates to
7 process and production of uranium that could --
8 the processes could still be classified, but it
9 didn't seem to me that the data that was in
10 those six boxes -- dust study records and film
11 badge readings and so forth -- didn't seem to
12 me that they ought to be classified 50 years
13 later, and that if they were classified, maybe
14 the reason they were classified was it was
15 inconvenient to release those data into the
16 public realm.

17 Anyway, that was on March the -- the 10th. I
18 believe the law provides 20 days for a
19 response, and it's now April the 26th and I
20 have not received any response to that request,
21 so I look forward to that in short order. And
22 you know, so Oak Ridge operations, ORAU at
23 NIOSH and the ORISE source vaults, I also wrote
24 to them.

25 Another comment I have about the technical

1 basis Rev. 1 is I understand that the SEC
2 petitions had to be separated for Mallinckrodt
3 and Weldon Spring. But it seems to me it would
4 have made sense had the MCW and the Weldon
5 Spring site profiles be constructed in parallel
6 and together and released at the same time. So
7 here we have a stagger of at least 18 months
8 where we've had Rev. 0 and Rev. 1 of
9 Mallinckrodt and we have no site profile yet on
10 Weldon Spring. And I know that's being worked
11 on and I even understand it may be released
12 soon, but it seems to me that that has really
13 created an inequity and a disparity that is
14 unfair for the Weldon Spring workers because we
15 heard in St. Louis voluminous testimony that
16 many workers worked for Mallinckrodt Destrehan
17 Street for many years and then they
18 matriculated out to Weldon Spring. And so if
19 their dose is being reconstructed, that may
20 well be that the part that's at Mallinckrodt is
21 now bolstered by this much-improved Rev. 1, but
22 the dose they received at Weldon Spring is not
23 covered at all by a site profile. So that
24 seems to be a -- a bad way that was handled.
25 My extended remarks -- and I won't go into them

1 at all, but it does highlight that I think that
2 despite the expanded volume of Rev. 1 of the
3 TBD there are still just enumerable statements
4 that have to do with data completeness, with
5 data ambiguities or uncertainties, data
6 omissions, and there are many, many qualitative
7 statements made like some or almost, things
8 that I can't understand as, you know, an
9 outsider how that could help a dose
10 reconstructor who's trying to make quantitative
11 estimates of a dose received, so I'd just
12 comment on that.

13 I guess one of the most important things that I
14 would like to address to the Board -- and this
15 goes to tomorrow's decision, hopefully -- and
16 that's got to do with the general situation of
17 data validity. And it seems to me that data
18 validity cuts across various levels of science,
19 and certainly in our longitudinal Alzheimer's
20 studies we have to justify to grant review
21 sections and study sections that our data is
22 valid and it's reliable. And how do we do
23 that? And it seems to me that in arriving at
24 that answer, what we can say is that this data
25 on Mallinckrodt has not been validated and it's

1 not proven to be reliable, and there's some
2 basic ways to do that.
3 One way to do that would be to have a gold
4 standard set of data, and that should be
5 available. The gold standard data could be
6 doses calculated -- not reconstructed, but just
7 calculated -- from a set of workers who had
8 complete data, so you could come up with a
9 dose. And then you could give their records --
10 say with some data purposely omitted in a
11 blinded fashion -- to your dose reconstructors
12 and get them to re-evaluate the dose and see if
13 they came up with a number that was close to
14 the gold standard. And by doing that in a
15 series of cases, you would come up with a
16 validity measure that yes, we can -- the same
17 dose reconstructor, for instance, could
18 reconstruct that dose, plus or minus ten
19 percent standard deviation, whereas another set
20 of dose reconstructors could do it at a
21 validity level of say 25 percent, whatever the
22 number is. But that sort of testing really is
23 -- is very necessary.
24 Another way to do it is to have the auditors,
25 SC&A, do the same thing and to have them

1 reconstruct the dose that the NIOSH
2 reconstructors have already done and compare
3 those data. And I understand that that has not
4 yet been done for a single Mallinckrodt worker.
5 So I would like to suggest that if the Board
6 believes that they have to act on what's in
7 hand right now, which I believe they should and
8 could, then they're going to have to act on
9 data that has not been validated. And so I --
10 I think that's one thing to consider.
11 As far as the SEC and the accuracy of the data,
12 another thing that they ought to repre-- ought
13 to ask is -- the data is certainly not
14 complete. It may be extensive. There may be a
15 lot of urine samples, lot of air samples, et
16 cetera, but the data is certainly not complete
17 for all workers. So then you have to ask well,
18 of the data that we have, how representative is
19 that data subset of the whole realm of data.
20 And I haven't seen any statements about that,
21 you know, and one way to do that -- and
22 certainly some on the panel are
23 epidemiologists, they should certainly be aware
24 of this -- is you take a population sample, you
25 take a random, unbiased sample of the total

1 universe of data and you -- and you use that
2 data to estimate data for the whole population.
3 If you don't have that, if you have a biased
4 sample or a random -- or -- or not a random
5 sample, or one that is really just -- this is
6 the data that's not missing, not specified,
7 then you really don't have representative data
8 and you certainly are on shakier ground
9 extrapolating that to a whole class of workers.
10 Final thing I have to say is it seems to me,
11 also, that there -- we are faced again with --
12 I understand the TBD is a living document, but
13 there's still parts of it that are just plain
14 incomplete. Section seven, for example,
15 dealing with external dose reconstruction, is
16 on hold. Why is it on hold? It's on hold
17 because ORAU hasn't entered some of that data
18 or calculated -- it wasn't clear to me exactly
19 why not. But section seven of this 18-month-
20 long living document is still not complete. So
21 I would ask the Board to please consider those
22 thoughts when you're making this very tough
23 decision. And -- and I do have to say that we
24 -- we're all engaged in applying scientific
25 principles, but we also have a mandate from --

1 you have a pres-- a mandate from the President
2 of the United States, and there is a strong
3 mandate also from Congress. And I think that
4 you have an obligation to live up to the intent
5 of Congress, and that intent goes to timeliness
6 and accuracy of doing dose reconstructions.
7 And I agree with Tom Horgan and Senator Bond.
8 I agree and support and applaud the sentiments
9 from Senators Harkin and Grassley that I
10 thought was eloquent in saying that the intent
11 of -- of Congress is not being fulfilled here.
12 And you -- you folks can address that. And I
13 hope and I pray that you will do that tomorrow
14 afternoon. Thank you very much.

15 **DR. ZIEMER:** Thank you, Dan, for your
16 insightful remarks. Yes, Jim Neton, please.

17 **DR. NETON:** I'm sorry, I'd just like to address
18 two of the statements made by Dr. McKeel, just
19 to correct maybe a misconception.

20 I think that the plutonium line that was in the
21 -- in the file -- it also caught our interest,
22 indicating there may have been plutonium at
23 Mallinckrodt. In fact, what that was -- at
24 least if it's the one that Dr. McKeel is
25 referring to -- was a reference to a paper on

1 how to do plutonium chemistry that was sent to
2 Mallinckrodt with the idea that it might be
3 adapted to do thorium analyses, because the
4 chemistry of plutonium and thorium are very
5 similar. And I believe that's the line item
6 that appears that Dr. McKeel was talking about.
7 The second issue is that the documents that
8 were released from the ORAU -- the vaults were
9 not necessarily -- they were not classified,
10 they were stored in classified space and needed
11 to be reviewed for classified content. It's my
12 knowledge -- my knowledge none of the documents
13 that were removed from the vault were
14 previously classified and then declassified.

15 **DR. ZIEMER:** Thank you for those
16 clarifications. Denise Brock. And Denise,
17 you're up next, too, if you want to --

18 **MS. BROCK:** I really wasn't going to say
19 anything, but I just wanted to address the two
20 things that Dr. Neton had stated. Number one,
21 as far as the plutonium, I believe that was
22 from Mont Mason, if I'm correct -- I could be
23 wrong -- to a Dr. Sheppard*, and could have
24 been to address the thorium, but it could have
25 been plutonium. I have workers on videotape

1 that I've offered to NIOSH and for the Board to
2 see in reference to numerous things. One of
3 those things was the possibility that plutonium
4 was in fact at the Destrehan Street site. I
5 have workers that are willing to testify to
6 that, but the workers that I have that are
7 living are very ill. We do have some things I
8 believe that are possibly on tape.

9 And the second thing that I was going to
10 address -- I just forgot, what was the other
11 thing that Dr. Neton had mention -- oh, the
12 boxes. I don't know -- were those on CD from
13 quite some time ago? I mean I thought you just
14 got those boxes, but could they have been on
15 CD? I -- because I -- and I also think, in
16 reference to the -- that 1975 Mont Mason memo,
17 I was with the understanding from the February
18 meeting that you all had just obtained that,
19 and then I found out that you had it since May
20 of 2003.

21 **DR. ZIEMER:** I don't know the answer to that,
22 and Mark, do you have a comment or --

23 **MR. GRIFFON:** I was going to ask -- I was going
24 to ask for clarification on the first point.

25 Jim, I agree with the statement you made with

1 the reference you're talking about, but I'm
2 wondering if that's the same one that Dr.
3 McKeel's talking about 'cause I see on page 3
4 of his letter there's this handwritten note
5 that suggests that there was a shipment from
6 Savannah River. This seems to be a different
7 reference, so I just wanted clarification on
8 where this came from --

9 **DR. MCKEEL:** Yes, that note from Savannah River
10 happened to be in paper -- that's a completely
11 different affair. That -- that's -- that's
12 explained in my records. It was on the back of
13 a meeting minutes. I have no idea who wrote
14 that. It just was in -- interesting that it
15 was there. But the reference I'm talking about
16 is in the supplement, just in the list of what
17 was in the boxes. And the reference refers to
18 plutonium urine analyses, and it doesn't refer
19 to a paper, although that may just be a
20 shorthand for a reference to a paper. So --

21 **MR. GRIFFON:** But I -- yeah.

22 **DR. MCKEEL:** -- so they're two completely
23 different things, but -- but they're two little
24 teeny bits of information talking about
25 plutonium at Mallinckrodt.

1 **MR. GRIFFON:** Okay, this --

2 **DR. MCKEEL:** That's -- that --

3 **MR. GRIFFON:** -- this was new to me, so I --
4 but I -- I --

5 **DR. MCKEEL:** It was new to me, too, and I just
6 thought it might be of interest, whatev--
7 whatever it means.

8 **DR. ZIEMER:** Thank you. Denise, did you have
9 any additional comments for the assembly? Did
10 --

11 **MS. BROCK:** (Off microphone) No, I just was
12 going to (unintelligible) --

13 **DR. ZIEMER:** Thank you.

14 **MS. BROCK:** -- (unintelligible).

15 **DR. ZIEMER:** Thank you. Are there any other
16 Mallinckrodt folks who did not have the
17 opportunity to sign up but do wish to address
18 the assembly this evening -- or St. Louis
19 folks? Okay, I -- I do have two others who
20 have signed up -- Tom, did you have an
21 additional comment?

22 **MR. HORGAN:** (Off microphone) (Unintelligible)
23 answer to the second question. Denise, you
24 know -- I didn't phrase it right, you know.
25 (On microphone) Come up here and let me know,

1 but it was my understanding, as well, the so-
2 called Mont Mason rebuttal memo that we got at
3 the 11th and a half hour at the St. Louis
4 meeting, which couldn't be made available and
5 wasn't even brought to the meeting, it's my
6 understanding they just got ahold of that
7 document, NIOSH, and that it was literally hot
8 off the presses.

9 Now Denise mentioned something that you found
10 out that they've had it since May?

11 **MS. BROCK:** (Off microphone) (Unintelligible)

12 **MR. HORGAN:** May what? Could you come up and
13 clarify that, 'cause if that's the case we'd
14 like to get some -- an answer to that question.

15 **DR. ZIEMER:** This Board got the Mont Mason memo
16 on -- at our meeting there. You were there.
17 Is there some additional information on that,
18 or Dick Toohey, can you address it?

19 **DR. TOOHEY:** Go ahead.

20 **MS. BROCK:** No, I -- I -- with the
21 understanding that you all got it the same time
22 I did. I'm just curious -- maybe I -- maybe I
23 misunderstood. When did -- when did NIOSH or
24 ORAU come into possession of that memo? Was
25 that -- because at the February meeting it was

1 my understanding you'd just gotten it.

2 **DR. ZIEMER:** I don't know the answer to that.
3 Is there -- Jim Neton, do you know anything
4 about the sort of background on that memo?

5 **DR. NETON:** I really think that we would need
6 to go back and look at the transcripts because
7 that was discussed in some detail at the
8 meeting, and I really don't want to use my
9 memory to recall, you know, what happened at
10 that meeting. But I don't -- I don't recall
11 and I need to look at the transcript to see
12 when we got the Mont Mason memo, 'cause it was
13 discussed.

14 **MS. BROCK:** Sorry, you just may as well stay up
15 here. About the boxes, have the -- has that
16 all been on CD all this time?

17 **DR. TOOHEY:** That's all -- well...

18 **DR. ZIEMER:** Richard Toohey, can you address
19 that?

20 **DR. TOOHEY:** Yeah. Yeah, that's the question I
21 came up to answer about the memo. Okay, the --
22 I don't remember the date, but it was the
23 second to last Board meeting when we had just
24 captured these six boxes, which actually got
25 consolidated into five 'cause two of them were

1 both Weldon Springs and half-full.

2 Okay. We -- in capturing those, we physically
3 got those boxes, and now I don't know whether
4 we made copies on the site or if we brought the
5 boxes and copied, but -- but in any case, as we
6 copied these things, we scan them and then the
7 documents, you know, get broken apart and put
8 on a CD. So right now, to the best of my
9 knowledge and belief, all those documents are
10 on CD/ROM and have been put in our site
11 research database.

12 **DR. ZIEMER:** Okay. Thank you. Dick Toohey,
13 you had signed up to address the assembly, so
14 you're at the mike, please.

15 **DR. TOOHEY:** Yeah, as long as I'm here,
16 actually I signed up to answer a couple of the
17 questions Mr. Horgan raised this morning in
18 Senator Bond's remarks. One was the -- I don't
19 remember the exact number, but it was the 140
20 or so Weldon Springs claims that had been
21 denied -- 148, thank you -- and what was the
22 basis for that denial. The basis was the ORAU
23 Team Technical Information Bulletin Number 2,
24 maximum dose reconstruction for Department of
25 Energy sites, which gives a maximum plausible

1 dose to a case. And if the probability of
2 compensation (sic) is still well below 50
3 percent, under the efficiency process allowed
4 by 42 CFR 82 -- I think paragraph (10)(k)(3) --
5 we can stop at that point because it is very
6 unlikely that any additional research would in
7 fact find this case to be compensable. NIOSH
8 refers to this as one of the efficiency
9 processes for completing dose reconstruction.
10 And since we do not, as you know, yet have a
11 completed site profile for Weldon Spring, that
12 is actually probably the only way we could
13 complete a Weldon Spring case at this point.
14 Speaking of Weldon Spring does come to the
15 point -- it's a partial reason -- the other
16 question was why have only a quarter of the
17 Mallinckrodt claims been done, and Weldon
18 Springs is part of that, because a number of
19 those workers, as we know, went on to work at
20 Weldon Spring. And without having the site
21 profile and the exposure models complete for
22 Weldon Spring, if a worker did not get enough
23 dose from the exposure at Destrehan to become
24 compensable, we cannot complete the dose
25 reconstruction till we've included these other

1 sources.

2 Hindsight's always 20/20. Maybe it would have
3 been better off to do Mallinckrodt and Weldon
4 Spring together. But our overall decision-
5 making process on the order in which we pursued
6 the site profiles was roughly in the order of
7 the number of claims from the site.

8 **DR. ZIEMER:** Okay. Tom, do you have --

9 **MR. HORGAN:** Now I've got to get a
10 clarification.

11 **DR. ZIEMER:** -- additional question or comment?

12 **MR. HORGAN:** So are you saying that the 23
13 percent rate of dose reconstruction at the
14 downtown site, which we're dealing with that
15 separate petition right now, is based -- is --
16 is that way because you're depending on
17 material from Weldon Spring?

18 **DR. TOOHEY:** What I am saying is that many
19 workers at Destrehan also worked at Weldon
20 Spring. If the dose they received at Destrehan
21 Street is not sufficient to get them over the
22 50 percent probability of causation, we cannot
23 complete their dose reconstruction until we
24 include their additional exposure at Weldon
25 Spring.

1 **MR. HORGAN:** I -- I -- I'm -- I'm at a loss
2 here because I thought we were dealing with two
3 separate sites, and that -- well, wait, wait,
4 wait, I mean we sub-- she submitted a site
5 profile (sic) that had the two sites together.
6 We were told by NIOSH that you had to split
7 them up. She did. Now I -- I'm a little
8 confused because if -- if this is the case, you
9 know, that we have -- because some of these
10 workers worked at Weldon Spring -- maybe I'm
11 missing something, but none of these -- it
12 seems to me a lot of these people aren't going
13 to get compensated for quite a while because
14 we're going to have to wait till the Weldon
15 Spring site profile's done and all that's done,
16 and I -- I don't know, maybe -- maybe it's
17 above my pay grade, but I -- I don't -- I don't
18 understand.

19 **DR. TOOHEY:** Well, no, you are -- you are quite
20 correct in that point. I would also point out,
21 though, that we have provided NIOSH with 9,300
22 draft dose reconstruction reports and
23 approximately 1,500 revised DR reports, and
24 have provided DR reports for more than half of
25 the cases that have been referred by DOL for

1 dose reconstruction from the 200 sites across
2 the country. Actually there's 300 sites that
3 are covered, but claims have only been received
4 from about 200 sites. And I realize that sites
5 which are not completed yet are unfair and we
6 had to start somewhere, and where we started
7 was with the sites that had the most number of
8 claims. So Savannah River, Y-12 and so on got
9 most of the attention up front.

10 Also, we were able to develop exposure models
11 for some sites where there was practically no
12 data available from the site itself, such as
13 Bethlehem Steel. And we have completed I think
14 over 600 claims from Bethlehem Steel.

15 One of the problems with Mallinckrodt was it's
16 a very complicated site. You had uranium in
17 many different forms in processing, recycled
18 uranium and all that. And in terms of creating
19 the site profile, we did Rev. 0. It did not
20 cover all the claims. The ones that could be
21 done with the data we had available, and
22 generally those would be claims that could be
23 compensated on the basis of that data, we were
24 able to complete. The ones that come to mind
25 would be lung cancer cases, just what we found

1 in Rev. 0 for radon levels at the site, there's
2 enough of a dose, just that, to make lung
3 cancers compensable, but no other types of
4 cancer.

5 Rev. 1 includes more data, so we can do more of
6 the Mallinckrodt cases. We may not be able to
7 do all of them. There may be -- some may need
8 to await Rev. 2, and some of them may even need
9 to await completion of Weldon Springs.

10 Denise, I remember you told me once that it's
11 about half the people who were at Destrehan
12 went on to work at Weldon Springs, or something
13 like that.

14 **MS. BROCK:** There's a large volume of people
15 that -- that had actually -- and I think Dr.
16 McKeel had addressed that, too, that had went
17 from Destrehan and a lot of them had moved over
18 to Weldon. My father wasn't one of those
19 workers, but a lot of them did.

20 But I -- I just had a question, and I
21 understand what you mean about if you don't
22 want to give somebody a denial letter if they
23 have possible exposure at another facility, so
24 you want to see if they're compensable, and I -
25 - I greatly appreciate how -- how you -- you

1 get the cases that you know you can compensate,
2 but it just hurts my feelings so bad or upsets
3 me when people that -- it's almost like the
4 cases are being prejudged with Weldon Spring,
5 and it would -- to me, it would be costly -- I
6 could be wrong, but if you had maybe a
7 pancreatic cancer, a non-metabolic cancer that
8 is one of the 22 SEC cancers and they, for
9 whatever reason, were an overestimate from
10 Weldon Spring and that case was denied, are you
11 not -- who contacts those people? I mean I
12 have a list of probably almost every claimant,
13 but that seems to me to be prejudging these
14 when in fact there could be an SEC and we're
15 just not sure of -- of the data. That's why I
16 filed a -- a petition on their behalf, as well,
17 so -- I mean I -- I'm going to be the first
18 person to tell you, I love when you compensate
19 these people. But to not compensate them
20 without giving them the benefit of the doubt of
21 a possibility of a cohort, it just doesn't seem
22 fair.

23 **DR. TOOHEY:** Well, again, I think the answer to
24 your question there is that the stat-- not the
25 statute but the rule and the implementation

1 guides say that if we can give a maximum dose
2 to a case, regardless of the site they worked,
3 as long as that -- we have something to base
4 that dose on -- we can't just pull an arbitrary
5 100 rem out of the air -- and in fact the model
6 we use is based on the highest intakes ever
7 observed across the complex, and our model
8 assumes that this one individual gets these
9 highest intakes from 18 different
10 radionuclides, most of which were not even
11 present at Weldon Springs, and if they're still
12 not compensable, they will never be compensable
13 under dose reconstruction.

14 **MS. BROCK:** And I almost hate to get in these
15 discussions because I'm not a scientist or a
16 health physicist, but just for an example, had
17 an -- my father worked, I think everybody knows
18 that, and I also had several uncles that worked
19 there. I had one uncle in particular -- and
20 this was at the Destrehan Street site, but he
21 worked there -- my aunt is 81. My uncle worked
22 there -- missed the 250-day mark, but during
23 that time frame. He was involved in an
24 accident. Well, she doesn't remember what kind
25 of accident, only that he was hospitalized.

1 And of course, you know, the
2 collation/killation* therapy, nobody even knows
3 what that is, and so if you're saying that
4 you're taking the maximum dose, I don't really
5 understand maximum dose, maximum plausible
6 dose. And what if he was involved in something
7 so horrific -- because he wasn't able to go
8 back to work, they wouldn't allow him after
9 that -- so how do you know it wasn't an
10 episodic event that caused something that would
11 have caused that type of cancer?

12 **DR. TOOHEY:** I would just say that the
13 technical basis for our maximum model would
14 cover that. It is so high that it would cover
15 any conceivable sort of intake.
16 Let me -- I've actually thought of a few other
17 remarks I would like to make, at the risk of
18 being perceived as proud and arrogant, but I
19 would want the Board to remember -- because
20 I've seen some indications today that there
21 seems to be a feeling about that if we do not
22 have very complete and reliable individual
23 monitoring data, we cannot do a dose
24 reconstruction, and that is simply not correct.
25 The rules permit us to do dose reconstruction

1 based on other data. Granted, individual
2 monitoring data has top priority. If we don't
3 have that, we can use coworker data. Failing
4 that, we can use area monitoring data. Even
5 without that, we can use process knowledge.
6 And in terms of doing health physics and
7 estimating doses, that's what we do all the
8 time.

9 I would dare say Drs. Roessler and Ziemer
10 remember when they took the certification exam
11 from the American Board of Health Physics they
12 were asked to calculate doses to a worker from
13 a given exposure scenario, given so much
14 cobalt-60 solution running through a pipe.
15 It's what we do all the time. So I simply do
16 not agree, as a professional health physicist
17 with 30 years of experience in dosimetry and
18 100 publications in the open literature, with
19 the statement that we have to have individual
20 monitoring data that is complete and verified
21 and valid and covers every possibility to do a
22 dose reconstruction that is adequate to make an
23 unambiguous and a correct compensation
24 decision.

25 I would also mention that the Cohen &

1 Associates review of the first 20 dose
2 reconstructions selected at random did in fact,
3 to my knowledge, find that -- even though there
4 were some, you know, trips and slips there in
5 some of the dose details -- every dose
6 reconstruction, they agreed, we came up on the
7 right side of compensability. And I see that
8 as the bottom line of this entire project.
9 Thank you.

10 **DR. ZIEMER:** Thank you, Richard, for those
11 remarks.
12 Tom?

13 **MR. HORGAN:** I just want to say a couple
14 things. Have you ever inf-- and -- and this
15 very well -- you may be right, this may be very
16 beneficial, but have you ever for-- has NIOSH
17 ever informed Mallinckrodt downtown claimants
18 who are waiting that their dose reconstruction
19 may be indicative (sic) on information coming
20 from Weldon Spring, the -- (off microphone) if
21 you know what I mean.

22 **DR. TOOHEY:** I think I know what you mean, and
23 the answer to that question is the claim that
24 is filed with Department of Labor identifies
25 the site at which the Energy employee worked.

1 **MR. HORGAN:** Okay, so yes or no?

2 **DR. TOOHEY:** So -- well, the employees know
3 where they worked and if we haven't published -
4 -

5 **DR. ZIEMER:** I think Tom is asking is the
6 employee made --

7 **DR. TOOHEY:** Aware of --

8 **DR. ZIEMER:** -- aware of the fact that --

9 **DR. TOOHEY:** -- where we are --

10 **DR. ZIEMER:** -- there's additional information
11 to be determined before their dose
12 reconstruction is completed, something along
13 that line.

14 **MR. HORGAN:** Yeah, basically what --

15 **DR. TOOHEY:** Okay.

16 **MR. HORGAN:** -- I'm trying to say -- what I'm
17 trying to say is the man -- the person who
18 worked at downtown and also worked at Weldon
19 Spring files a claim at downtown. He's waiting
20 for his dose reconstruction for the downtown
21 site. Is he aware -- or he or she aware that -
22 - that the processing of that dose
23 reconstruction may dep-- may depend on
24 information coming from the Weldon Spring site?

25 **DR. ZIEMER:** Yes, Larry Elliott has --

1 **MR. ELLIOTT:** Let me answer this, if I may, Mr.
2 Horgan. When a claimant files a claim with the
3 Department of Labor, they are asked to list all
4 sites that are under the covered facilities
5 list where they worked. That is a critical
6 component of the eligibility of their claim
7 that DOL must verify, because DOL recognizes,
8 as we do, that multiple site experiences can
9 lead to a compensable claim. And we don't want
10 to miss any dose from another site, and so I
11 just -- I hope that answers your question. So
12 unless there's a claimant that decides that
13 they don't want to list a site, we work hard,
14 DOL works hard to make sure that claimants
15 understand that they have to include all sites.
16 It's to their interests.

17 **MR. HORGAN:** (Off microphone) (Unintelligible)

18 **MR. ELLIOTT:** Yes, I'm sure that the Department
19 of Labor, in their forms -- they work closely --
20 -- the claims examiners work --

21 **MR. HORGAN:** (Off microphone) (Unintelligible)

22 **MR. ELLIOTT:** You can verify it, but I'm pretty
23 confident in my answer to you, sir, that --
24 that Department of Labor wants to make sure
25 that the claimants understand to add any -- any

1 experience from any multiple-site exposures
2 that they might have.

3 **MR. HORGAN:** (Off microphone) (Unintelligible)

4 **MR. ELLIOTT:** I am very certain of that, sir.

5 **DR. ZIEMER:** Thank you very much. I have
6 Richard Miller next on the list.

7 **MR. MILLER:** Good evening. I -- Richard Miller
8 with GAP. I couldn't help today during the
9 question and answer session but notice a
10 discussion about contaminated blanks. And I
11 went back to my room and got on my laptop and
12 found Rev. 1 and looked up the section of the
13 pages that discussed the contaminated blank
14 situation, and -- and it look-- and it's not
15 entirely clear how long a time period there
16 were contaminated blanks, one; were there
17 correction factors imposed which would have
18 affected the dose results because it would be
19 subtracted, it wouldn't be added, it would be
20 in a non-conservative direction; and to what
21 degree does this affect the credibility of the
22 data that's the issue here. Can someone
23 address the contaminated blank problem and how
24 many years this went on or -- or months or was
25 this just one incident, and has anybody dug in

1 and even verified that question? Is that
2 something --

3 **DR. ZIEMER:** Jim Neton --

4 **MR. MILLER:** -- we can address?

5 **DR. ZIEMER:** -- may be able to shed some light
6 on this.

7 **DR. NETON:** I'm not prepared to answer that
8 question this evening, but we certainly can
9 look into it and provide an answer.

10 **MR. MILLER:** Could I -- I don't want to trouble
11 you, Jim, 'cause I know there's many hours a
12 day that you work, but if this Board's going to
13 have to ask and answer questions on the special
14 cohort, and this is now on the table about --
15 about the -- you know, this question about --
16 people are asking how much can we rely on the
17 data here, and this seems to be an interesting
18 data reliability issue that if we could get
19 answered and understand the degree and extent
20 and scope of it and what years it covers and
21 how many samples might be affected so that when
22 we saw the large volume -- I don't want to be
23 in the business of necessarily confusing
24 quantity and quality.

25 The second thing I just wanted to flag for you

1 all -- it -- it struck me -- it was -- it came
2 out in the memo that was sprung on the Board
3 and -- and the petitioners at the last meeting
4 in St. Louis was this 33-page memo which --
5 which -- which some -- some purport -- on the
6 record, at least -- that was written by Mont
7 Mason, and I think others will address its --
8 its pedigree. I think there's some questions
9 about the pedigree of that memo, and I think
10 careful reading would indicate there's some
11 pedigree issues. But one of the interesting
12 things that was revealed to me, and someone who
13 has spent some time studying Mallinckrodt and
14 kind of digging through the records for the
15 last couple of years, was we kept coming across
16 documents which talked about the I-factor. And
17 I don't know if it jumped out at you, but it
18 jumped out at me because the I-factor was a --
19 was a factor invented by Mallinckrodt which
20 Mont Mason mentioned in passing in one of his
21 letters, and what the I-factor turns out to be
22 and what -- for the -- was -- was the -- was
23 the mysterious employee threshold that
24 heretofore did not want to be disclosed
25 publicly for fear that this could either not

1 only cause workers concern, but could cause
2 them to -- and doubt the credibility of
3 management, but could raise liability concerns.
4 And the I-factor was that they -- at -- if you
5 reached 90 percent of this factor, they will
6 remove you from your job.

7 Now what was the threshold level for the
8 removal of someone from their job? It was 600
9 rem to the lung. Now at that time the standard
10 was 15 rem to the lung. I think -- it came out
11 of the studies that were done at Rochester, but
12 the AEC used that as their guide. And so it
13 was really stunning to see that you had a 40-
14 fold increase over the recommended level from
15 the AEC being used as the basis for removing
16 people -- 90 percent of that figure for being
17 removed from their job. Which -- which left in
18 my mind, at least -- or planted this seed --
19 which was, you know, if I had that problem on
20 my hands, I'd have a liability concern, too.
21 What's amazing is how long it took for that
22 actually to find its way in the public domain.
23 I don't know whether this was obvious to the
24 rest of the world, but to me it's pretty
25 stunning and close to barbaric that you would -

1 - you would accept 540 rem before you decided
2 to remove somebody from their job at this
3 particular facility. And I -- and I -- and I
4 think it's -- and it's -- it's an important
5 equity issue.

6 The third issue I just wanted to question had
7 to do with -- with the raffinate -- raffinates
8 which we've talked about so many times, and I
9 noticed in the supplement to the SEC that --
10 that -- that this was addressed at least in
11 terms of concentrations -- or fractions,
12 really, of thorium or fractions of actinium or
13 protactinium and so forth. What I'm trying to
14 figure out is where exactly in the process do
15 people assume, one, that this material would
16 concentrate and the concentration -- I don't
17 mean the concentration levels in the air, but
18 the concentration in the production process.
19 Because as you go through a distillation,
20 whether it's ether extraction or -- I guess
21 they had various acid extraction processes as
22 they went through their uranium refining
23 process. Just the question I had was how do
24 you know what the concentrations are that are
25 being concentrated in the process, because

1 that's going to speak volumes to what your
2 potential uptakes are going to be.
3 Now when I -- I heard the discussion today
4 about the sperry cake, and I think that's a
5 significant issue, you know, in terms of --
6 that Dr. Makhijani raised, but when we looked
7 at the production process when all of these
8 cakes were produced, or filter press material
9 were produced, it was produced by taking lime
10 and mixing it with acid. Right? It was
11 neutralization process that went under in order
12 to get kind of this -- this -- this -- I don't
13 know what you want to call it, paste and or --
14 or -- or -- or extract. And it seems to me --
15 there's a lot of questions about is this stuff
16 only in dust form, was it available in a
17 aerosol form if you heat things up and they're
18 warm and then you make -- mix an acid in a base
19 of great difference, you know, you get a
20 reaction, you get a vapor -- you get vapor form
21 -- has this been accounted for?
22 Now ordinarily I would say who would worry
23 about -- it's only ur -- if it was only
24 uranium. But when you're talking about the
25 isotopes of interest here of some radiologic

1 significance, it would be interesting to me
2 because when reading the site profile I saw
3 still, even in Rev. 1, very little discussion
4 in detail about the processes by which this
5 went on. There was one discussion about a
6 cloth belt where the material was -- was -- was
7 pressed and -- and it would be scraped off and
8 then it would be put into drums. But there's a
9 -- this is a wet, sloppy process. I mean I --
10 I worked -- I used to be a mechanic and I
11 remember what industrial processes were like,
12 and filter presses -- you go even into a sewage
13 treatment plant today -- are not neat, pristine
14 processes. It's not -- and it's -- leaving
15 aside whatever aesthetics may be associated
16 with it. And so to the extent that one has a
17 wet, sloppy process by which you're making cake
18 and you're pressing out the liquids and you're
19 separating the solids, I've seen very little
20 discussion about the character and I've seen
21 nothing with respect to worker interviews,
22 which would illuminate this if there's no paper
23 trail to support this.
24 So I would just welcome further in-- sort of a
25 further exploration of this because it's been

1 on the table for about a year, and I still
2 don't have a very good answer. Maybe it's
3 'cause the records aren't there to support it,
4 and maybe the worker interviews are or aren't
5 there to support it, I don't know, you know,
6 Denise, whether you will know, but it seems to
7 me we need to know a lot more about the
8 raffinate part of this process. It seems to me
9 there's a lot of ambiguities, leaving aside the
10 fact that there was an effort made to come up
11 with fractions of activity level.
12 I just want to comment on the CD issue, just
13 briefly. It's my understanding that the
14 records that are being discussed that were on
15 CD were the six -- five or six boxes of data.
16 They were scanned and put on a CD. It would be
17 great if Dr. McKeel, assuming there's no
18 Privacy Act information, could get it. One of
19 the problems we see to be having -- I remember
20 working on the Freedom of Information Act
21 request trying to get the original memo out of
22 Merril -- on Merrill Eisenbud, and we spent two
23 years and didn't get it and fortunately NIOSH
24 produced it for us. We learned that the V2161
25 shelf record information which was recently

1 transmitted in the package and we saw the
2 inventory from the Federal Records Center, that
3 request has been hanging out there for several
4 years. And one of the disadvantages I think
5 that those of us on the outside of government
6 have is we -- we file FOIA requests in good
7 faith and we sort of hope someone's digging and
8 get them, and then it's a little hard for us to
9 play a role in the process when this stuff's
10 already been captured in the system and we
11 can't even get it. So I just thought I would
12 pass that along because I do think if ORAU is
13 sitting on this information, it'll be very
14 helpful -- and some of this stuff was collected
15 by ORAU -- it'll be very, very helpful if there
16 were some mechanism that if you file a FOIA
17 request to the Department of Energy, it -- it
18 somehow funnels into the system, gets to you
19 all, you go into your O drive or whatever it's
20 called and it gets back out to the public
21 because we're at -- we're -- there's a lack of
22 symmetry in access to information here.

23 **UNIDENTIFIED:** (Off microphone) (Inaudible)

24 **MR. MILLER:** It's true, huh? Okay. The last
25 -- the last I guess issue going back to the

1 liability concerns was the discussion about
2 should -- because AEC was doing a separate
3 monitoring program from the Mallinckrodt and
4 that -- and -- and then -- sort of the argument
5 that was made about why one can separate the
6 pre-'48 time period from the post-'48 period,
7 one of the arguments that was made was well,
8 look, AEC's in the game. And I guess one of
9 the things that I would really like to know is,
10 you know, is there a real sense of validation
11 that AEC will always be consistently more valid
12 than the Mallinckrodt records. There was one
13 discussion of this in the Sanford Cohen report
14 where they evaluated one MCW versus one AEC
15 record. But it seems to me we would want to
16 know whether -- one question is would you
17 always go with the higher of the two in the
18 interest of conservatism? If there's a reason
19 not to do so, why not? But -- but this --
20 given that we've seen some of the same samples
21 that were supposedly side-by-side come out much
22 higher on one side, much lower on the other,
23 what I question is how broadly can we even
24 embrace the concept that the AEC data is going
25 to be sort of the gold standard that we can

1 subscribe to, that we can have great confidence
2 in. MCW may -- may have done a lot of
3 sampling, there may be a lot of records, but --
4 but -- but you know, it's sort of we've got a
5 verification.

6 Because we have this lack of parity in outcome
7 of results with what we thought were similarly-
8 situated monitoring circumstances, can we
9 actually subscribe to that cutoff date? Can we
10 actually say we now have valid data going
11 forward, post-'48, because we can rely on the
12 fact that AEC data is therefore necessarily
13 valid and MC-- and -- and we'll always be
14 validating Mallinckrodt. And I don't know if
15 there's been an analysis done by -- by anybody
16 to try to prove what I think is more of a
17 hypothesis than necessarily a conclusion, but -
18 - but that's -- those are my thoughts. Thank
19 you.

20 **DR. ZIEMER:** Thank you, Richard. Dick Toohey
21 may have a comment on yours.

22 **DR. TOOHEY:** Just one. I was looking in my
23 notes on -- on the numbers. We have 315 claims
24 from Destrehan Street and 200 from Weldon
25 Springs. I don't know the exact number, but I

1 believe that actually represents 400 or
2 possibly fewer individuals, you know, because
3 numbers of workers claim both Destrehan Street
4 and Weldon Springs. And while I was looking
5 for that, I ran across our site profile
6 schedule, which says the Weldon Spring site
7 profile was due to NIOSH for initial review
8 this week. So it won't be too much longer to
9 wait on that, hopefully.

10 **DR. ZIEMER:** Okay. Thank you. Let me ask if
11 there are any other individuals in the assembly
12 that wish to address us tonight?

13 (No responses)

14 If not, that completes our public comment
15 period. We do thank you all for coming and for
16 either sharing or being a part of this meeting.
17 I would remind you that the Board will resume
18 its deliberations tomorrow morning. The actual
19 discussions will begin shortly after 8:00
20 o'clock -- 8:15, according to my schedule. So
21 we look forward to seeing many of you at that
22 time. Thank you very much and goodnight,
23 everyone.

24 (Whereupon, at 8:30 p.m. the meeting adjourned
25 to Wednesday, April 27, 2005 at 8:00 a.m.)

C E R T I F I C A T E O F C O U R T R E P O R T E R**STATE OF GEORGIA****COUNTY OF FULTON**

I, Steven Ray Green, Certified Merit Court Reporter, do hereby certify that I reported the above and foregoing on the day of April 26, 2005; and it is a true and accurate transcript of the testimony captioned herein.

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

WITNESS my hand and official seal this the 26th day of May, 2005.

STEVEN RAY GREEN, CCR

CERTIFIED MERIT COURT REPORTER**CERTIFICATE NUMBER: A-2102**