

1 **MR. HINNEFELD:** -- (unintelligible) be case-
2 specific.

3 **MR. GRIFFON:** But -- yeah, I suppose in this
4 kind of situation you're going to say well,
5 we're not sure that the surrogate's the right
6 way to go. If the model predicts the higher
7 value, then you go with the more claimant
8 favorable.

9 **MR. HINNEFELD:** Yeah, I think (unintelligible)
10 --

11 **MR. GRIFFON:** (Unintelligible) big a deal --

12 **MR. HINNEFELD:** -- (unintelligible) design --
13 yeah, it's not that big a deal, so why bother
14 to fight about it.

15 **MR. GRIFFON:** Right.

16 **MR. HINNEFELD:** So let me go back and -- well,
17 I'm not saying our evaluation's complete and I
18 don't necessarily make a policy statement
19 there, but I think there's some issues here
20 that certainly should be added to just
21 evaluating the MCNP.

22 **MR. HINNEFELD:** Number eight -- I hope that
23 this will go relatively quickly because I
24 believe this is a valid comment, and I don't
25 know what (unintelligible), but I don't know

1 how to resolve it yet. I think the resolution
2 -- I'm sorry, comment number eight relates to
3 how the external rate for residual
4 contamination was reconstructed, and it relies
5 on a survey that occurred a number of years
6 after termination of operation. It relied --
7 and then a distribution built around a sort of
8 improbable exposure scenario, like the highest
9 -- you know (unintelligible) got the highest
10 dose rate (unintelligible). That's improbable,
11 but you're starting from this late base survey,
12 and so we suspect something was --
13 (unintelligible) was the phosphate plant, that
14 there's a generally elevated exposure level
15 around the phosphate plant around the phosphate
16 operations (unintelligible) whatever happens
17 (unintelligible). So we just -- you know, we
18 kind of suspect that the elevated dose rates
19 found in 1978 had more to do with the radium in
20 the phosphate than they had to do with
21 separated uranium, because separated uranium
22 really doesn't do much in terms of dose rate.
23 So -- but we won't know until we really do an
24 evaluation of the survey itself, which I've not
25 managed to get my hands on yet. And even then

1 we might not be able to know. Even then we
2 might not know.

3 **UNIDENTIFIED:** The urinalysis would presumably
4 try to distinguish that --

5 **THE COURT REPORTER:** I'm sorry, who is this?

6 **MR. FITZGERALD:** Joe Fitzgerald -- try to
7 distinguish between the contribution from
8 separated uranium versus what might be the
9 overall (unintelligible) -- you know --

10 **MR. HINNEFELD:** The urinalysis?

11 **MR. FITZGERALD:** Right.

12 **MR. HINNEFELD:** Well, the urinalysis presumes
13 that all the uranium in the urine is
14 occupational exposures relat-- directly
15 related. We made no at-- we made no attempt to
16 ascribe some background uranium intake level.

17 **MR. FITZGERALD:** (Unintelligible) understand
18 that, where the phosphate contamination issue
19 comes into play, because you're not going to be
20 able to easily distinguish (unintelligible) --

21 **MR. HINNEFELD:** It depend-- it depends upon
22 where the sur-- what the survey describes and
23 where they found the elevated dose rates. If
24 they found the elevated dose rates in -- on the
25 side of building 55 that is adjacent to

1 (unintelligible), but you wouldn't have a clue
2 that they're measuring radium shine
3 (unintelligible) or if they measured it outside
4 the uranium processing building. If that's
5 where the elevated exposures were, it to me is
6 a little bit of a stretch to say that these
7 numbers are resulting from the uranium -- and
8 (unintelligible) --

9 **MR. FITZGERALD:** (Unintelligible)

10 **MR. HINNEFELD:** Well, if the survey is -- is
11 written well --

12 **MR. FITZGERALD:** Right.

13 **MR. HINNEFELD:** -- and depending on how it's
14 written, what they decided to write down and
15 what they didn't decide to write down
16 (unintelligible) so really we may or may not be
17 able -- we may or may not be able to. It may
18 not tell us anything. But we want to at least
19 start there in terms of (unintelligible).
20 That's a work in progress and it's probably
21 going to hinge on being able to distinguish --
22 and we -- and we may not learn anything from
23 that --

24 **MR. FITZGERALD:** Right.

25 **MR. HINNEFELD:** -- we'll -- I think there may

1 be -- need to be some -- some other way to
2 address this rather than base it on a 15-years-
3 later survey. I don't know that the numbers
4 will go up very much, because I don't know that
5 residual uranium contamination is going to
6 contribute much to your photon dose rate.

7 **MR. FITZGERALD:** That's an interesting
8 precedent issue for --

9 **THE COURT REPORTER:** I'm sorry, who is this?

10 **MR. FITZGERALD:** I'm sorry, Joe Fitzgerald.
11 But it presents an interesting issue which will
12 have to be resolved in any case, I think, as
13 far as other type -- as far as (unintelligible)
14 --

15 **MR. HINNEFELD:** Well, certainly -- certainly
16 residual contamination is a -- is a -- will be
17 an issue at a great number of sites. It
18 certainly will.

19 **MR. GRIFFON:** And I agree with -- this is Mark
20 Griffon. I agree with Joe Fitzgerald that
21 (unintelligible) applicable. I mean you have
22 these --

23 **THE COURT REPORTER:** I can't hear you, Mark.
24 Can you speak into the mike?

25 **MR. GRIFFON:** This issue comes up in other site

1 profiles and they have these FUSRAP or
2 (unintelligible) surveys done years later --
3 15, 20 years later so -- so it's an important
4 precedent.

5 **MR. FITZGERALD:** Yeah, Joe Fitzgerald. Yeah,
6 the FUSRAP surveys that were done in the '70's
7 if not early '80's -- it was actually '60's,
8 '70's and early '80's -- are all going to give
9 you that -- that -- that benchmark screening
10 probably years after the actual operation and
11 one'll have to deal with that in different
12 varying time frames, but it'll be a useful
13 position to arrive at so that, you know,
14 those'll all be addressed uniformly, at least
15 from a policy standpoint.

16 **MR. GRIFFON:** Mark Griffon again, and this
17 one's complicated by the commercial versus AEC,
18 and other sites are complicated I think by
19 commercial, AEC and also DOD/AEC, yeah, so...

20 **MS. K. BEHLING:** There's one last issue, and
21 this should also go quick because it has to do
22 with -- we had asked NIOSH if they shouldn't
23 consider the photofluorography of the X-rays
24 because of the time frame that was in
25 operation. They had not been considered, but I

1 believe (unintelligible) correct me
2 (unintelligible) behalf, Stuart, that you are
3 going to consider that (unintelligible) to that
4 issue.

5 **MR. HINNEFELD:** What we're doing is essentially
6 expanding our research into X-ray technique
7 because the document that's referenced
8 (unintelligible), SC&A report references that
9 document (unintelligible) evidence for
10 photofluorotography*. The research for OTIB-6
11 really focused on DOE site (unintelligible).

12 **MS. K. BEHLING:** Okay.

13 **MR. HINNEFELD:** So while the research for the
14 general population may turn out the same
15 answer, we don't know yet. We haven't done
16 that, so that's what we're doing. So we are
17 pursuing that.

18 **MS. K. BEHLING:** Okay.

19 **DR. H. BEHLING:** Hans Behling again. I think
20 it would behoove us if we tried to go through
21 the next one before we break for lunch.

22 **MS. K. BEHLING:** So it should also go quickly
23 because -- I'll let -- I'll let Stuart explain
24 the situation, but I think it (unintelligible)
25 SC&A (unintelligible).

1 MR. HINNEFELD: Okay.

2 **MR. GRIFFON:** This is Mark Griffon, and I was
3 just going to say Ray, if you ever need a break
4 here, just let us know. Okay? 'Cause we can't
5 get your eye signals.

6 THE COURT REPORTER: Yeah, let me take a quick
7 moment here to say -- I am having trouble --
8 I'm really concerned about the clarity of the
9 transcript. Dr. Hinnefeld, if you could talk
10 more directly into the microphone and just a
11 little bit slower. I'm understanding a lot of
12 you, but it so scientific that some of it just
13 kind of bleeds together.

14 The best person in the room I'm hearing is Dr.
15 Hans Behling, so if everybody can like -- I
16 don't know, but if you'll give me just a second
17 here, I also need to do something to my
18 equipment.

19 DR. H. BEHLING: Yeah, I think --

20 MR. HINNEFELD: Okay, Ray, let -- let us know,
21 Ray, when you're ready.

22 THE COURT REPORTER: Okay. Thank you.

23 (Pause)

24 THE COURT REPORTER: Okay, I'm ready when y'all
25 are.

1 **MR. HINNEFELD:** You ready, Ray?

2 **THE COURT REPORTER:** Yes, thank you.

3 **MR. HINNEFELD:** Okay, we're ready. We're all
4 the way up to case #2.

5 **THE COURT REPORTER:** This is -- is this
6 Hinnefeld?

7 **PRESENTATION/DISCUSSION OF ISSUES FOR CASE #2**

8 **MS. K. BEHLING:** This is Kathy Behling, and
9 I'll just quickly give you a summary. This is
10 a -- case #2 is from the Huntington Pilot
11 Plant. The (unintelligible) was a
12 that was the claimant. He worked from
13 through throughout the facility, and
14 he had bladder cancer.

15 **MR. HINNEFELD:** Issue number one on the
16 Huntington Pilot Plant is the comment that the
17 uranium that contaminated the nickel -- the
18 Pilot Plant -- the Huntington Pilot Plant took
19 recycled nickel from the diffusion plant and
20 purified it, and it was contaminated with --
21 the -- the nickel was contaminated with the
22 uranium that had been fed through the cascades,
23 and they purified it and then sent it back to
24 the -- to the diffusion plants.
25 Comment number one or issue number one is --

1 makes -- comments on the fact that the uranium
2 fed to the cascades was not necessarily pure
3 uranium. It had non-uranium contaminants in it
4 because ura-- because DOE was recycling
5 uranium, and the ones typically of interest are
6 plutonium, neptunium and technetium. And that
7 is a -- that is a valuable reminder to -- to us
8 that when we embark on these models and these
9 dose reconstructions from that era to bear in
10 mind that a uranium plant may not have had
11 strictly uranium in its product.

12 Our own view, though, is that the Huntington
13 Pilot Plant site profile makes an assumption of
14 a 39 percent enriched uranium product as a --
15 you know, this stuff was contaminated -- 39
16 percent enriched uranium, and -- and our view
17 is that it would be much more logical to assume
18 an enrichment more on the order of four
19 percent, which was I believe even described as
20 the general average. I don't know if that's a
21 really mathematically-calculated average, but
22 the general average of the enrichment of the
23 uranium that was -- that was regenerated or
24 collected -- reclaimed at Huntington. And so
25 we feel like that four percent, that represents

1 about a tenfold change in specific activity,
2 and so we've overestimated the uranium intake
3 by a matter of tenfold just by making that
4 enrichment assumption. We feel like that
5 overwhelms the contribution from the non-
6 uranium contaminants in this case, since we
7 made that 39 percent adjustment. It doesn't
8 mean that we should not bear in mind the
9 comment about recycled uranium and non-uranium
10 components, just in general, and keep it in
11 mind in all the work we're doing.

12 **MS. K. BEHLING:** This is Kathy Behling of SC&A
13 and SC&A is -- does agree with that argument.
14 The only comment that John asked me to pass
15 along was if -- if we could expand on the TBD
16 sometimes and include these types of
17 explanations, it would -- it would eliminate
18 and avoid some of the questions that we have.
19 I think that might be a recurring theme
20 throughout the day.

21 **MR. GRIFFON:** This is Mark Griffon. I'm
22 reading the -- I hear that SC&A agrees, but I
23 see that RA says I strongly disagree, and I --
24 I'm sort of in RA's camp on this one. I don't
25 know about how strongly, but I think I -- I

1 have some reservations on this -- this one,
2 especially -- there's certain buzzwords that
3 always alarm me with this recycled uranium, and
4 the one that I've seen for years is trace,
5 trace amounts of technetium, neptunium and
6 plutonium. So I guess -- I guess -- you know,
7 I hear the argument and I agree that the 39
8 percent enriched is conservative over the four
9 percent enriched 'cause you're talking about
10 samples -- I guess you're talking about nickel
11 air samples. Right? The -- the -- originally
12 --

13 **MR. HINNEFELD:** Yeah, nickel air samples and a
14 500 part per million uranium specification in
15 the nickel.

16 **MR. GRIFFON:** Right. So I agree with that. On
17 -- on the other hand, I don't see anything
18 about estimates or any numbers on how much
19 technetium, neptunium, plutonium might have
20 been in there. And the other side of this also
21 is that since you are purifying the nickel,
22 you're obviously collecting the contaminants
23 somewhere, so your concentrations could even be
24 higher. You could have some -- some points in
25 the process. I'm not familiar with this

1 process, but some points where your trace
2 amounts become more important. So I guess -- I
3 guess I'm just concerned about disregarding
4 these transuranic exposures, assuming that a
5 factor of ten is going to sort of capture that.
6 If it could be validated, I -- I would
7 certainly, you know -- I don't see a problem
8 with it, but I guess -- I think -- I think
9 that's what I thought (unintelligible) position
10 was here.

11 **MS. K. BEHLING:** Yes, excuse me --

12 **MR. GRIFFON:** (Unintelligible) speak for us --

13 **MS. K. BEHLING:** No, this -- this is Kathy
14 Behling from SC&A, and the document that we're
15 all looking at was just submitted to the SC&A
16 office yesterday with -- and RA stands for
17 Robert (unintelligible), with his comments on
18 here, which I didn't see till just now because
19 I'm looking at this as you are and I apologize
20 for not relaying his comment on this issue.

21 **MR. HINNEFELD:** Well, we can -- we can do some
22 validation. I think there -- there's --
23 there's a fair amount of published information
24 about transuranics in the recycled uranium
25 stream. You know, it was determined after the

1 fact, you know, but it seems to be a pretty
2 good representation of the material. And I
3 think there certainly can be some validation of
4 it done, maybe trace quantities -- you know, we
5 -- I certainly will agree we ought to remove
6 the word "trace" from our -- from our response.
7 I think that there are a number of things that
8 may mitigate this. They -- you know, the
9 transuranics tend to stay in the cylinder, in
10 the feed, you know, at the (unintelligible)
11 sites, stay in the cylinder as opposed to
12 (unintelligible) stay behind. So I think that
13 -- I'm pretty confident we're going to be okay
14 on this one, but I understand your point. Just
15 saying that ten times as much uranium than they
16 really got covers it is not necessarily
17 (unintelligible).

18 **MR. FITZGERALD:** This is Joe Fitzgerald. DOE
19 really got into this issue related to the
20 Paducah question that arose a few years ago and
21 there was a (unintelligible) done of what
22 recycled material went where in the DOE system
23 and what were some of the significant -- I'm
24 trying to avoid using the word "trace", but
25 significant radionuclides that were in this

1 (unintelligible) and technetium was significant
2 in some cases. It varied from site to site,
3 depending on the type of process that was
4 involved in terms of what was concentrated and
5 where it was concentrated. In some cases the
6 trace materials were concentrated in certain
7 parts of the operation at that particular site.
8 So it's not so much a generic issue of saying
9 it's insignificant in some places because of
10 the chemistry involved. The nuclides were
11 significant in certain evolutions and for
12 certain worker groups. But I think that's a
13 question that probably needs to be addressed as
14 where would you in fact have these nuclides
15 become significant because of the nature of the
16 operation and what groups were most affected.
17 In this particular case I think the solution is
18 a valid one that -- that the enrichment issue
19 (unintelligible) the contribution, but that's
20 not going to be likely the case at other sites
21 (unintelligible) operations, so -- but it
22 certainly was something we need to keep in
23 mind, you know, throughout. It probably will
24 have to be treated site by site looking at the
25 operation, looking at -- in this case there's

1 the value of having had the analysis done by
2 DOE in some detail so there's actually a road
3 map as to what concentrations may have existed
4 where.

5 **MR. HINNEFELD:** Right. And then --

6 **THE COURT REPORTER:** Wait, I think I'm getting
7 confused. Was that statement just made by
8 Fitzgerald or Hinnefeld?

9 **MR. FITZGERALD:** Yes.

10 **MR. HINNEFELD:** It was made by Fitzgerald..

11 **THE COURT REPORTER:** Okay. The two of y'all
12 sound rather alike over the phone.

13 **MR. HINNEFELD:** I'm sure Joe's -- I'm sure
14 Joe's very dismayed by that.

15 (Pause)

16 Okay, issue number two on case #2 is about the
17 verified employment period and the potential
18 for exposure to residual contamination during
19 some period afterward. And I think this
20 probably needs to be re-evaluated for this
21 case. I don't know that it's going to matter a
22 whole lot, but in this case it probably should.
23 Huntington I think is perhaps the only place
24 where the Department of Labor has verified
25 employment at a specific facility -- specific

1 building at that plant. Huntington Plant
2 apparently is a larger plant. The nickel
3 recovery occurred in a building called the
4 Reduction Pilot Plant. The DOL verified --
5 gave us a verified employment period that ended
6 in something like that. So when you
7 look at their verification, the form they sent
8 us, they said well, the person continued to
9 work there till after Reduction Pilot
10 Plant had stopped its operation. So yeah,
11 there's -- unless we have evidence that they
12 boarded it up, locked it up and didn't let
13 anybody go in there, chances are there's a
14 residual radioactivity component here that we
15 did not address in this dose reconstruction. I
16 don't know that it's going to represent a whole
17 lot of exposure, but (unintelligible) and in
18 fact there was a couple of things. One thing
19 we didn't comment on here, SC&A did point out a
20 mistake in the internal dose assessment portion
21 of this case that was a mistake. It was just a
22 flat mistake that overestimated the internal
23 dose by 1,400 times, or something like that.

24 **MS. K. BEHLING:** (Unintelligible)

25 **MR. HINNEFELD:** A lot. I knew it was a lot.

1 So it has been significant-- I mean the outcome
2 of this case is not in doubt. I mean it's not
3 going to change. This came out less than 50
4 percent POC with that 14,000-fold overestimate
5 of the internal dose, so this is not going to
6 change. But that is -- that is a worthwhile
7 thing for the consideration of these claims,
8 that in fact for Huntington we might need to
9 check our verification of employment dates to
10 make sure that this issue doesn't pop up
11 elsewhere.

12 Another comment that SC&A made that we don't
13 respond to because we're still -- we're
14 investigating it, as well -- is the use of the
15 air -- the nickel airborne measurements that
16 were utilized to build the models spanned a
17 long period of time. Some were collected early
18 on, some were collected more recently. And the
19 comment was the more recent samples probably
20 under-represent the actual nickel airborne
21 levels back in the time of this operation
22 because plants got cleaner as time went on.
23 And that -- we're trying to pursue that and
24 figure out what we can do about that. It is
25 important to -- I think -- if we only use the

1 samples that are referred to as historical
2 samples -- in the TBD there's a table of nickel
3 samples. If we only use the samples that are
4 called historical samples, meaning the earliest
5 ones, the geometric mean goes up by -- what,
6 about a factor of four?

7 **UNIDENTIFIED:** Say four or five.

8 **MR. HINNEFELD:** Yeah. And I think the ac-- the
9 geometric standard deviation actually gets a
10 little smaller. Is that right?

11 **UNIDENTIFIED:** That's correct.

12 **MR. HINNEFELD:** Okay. So there would be some
13 change in the intake rate again. So for this
14 case, since there's a 14,000-fold overestimate,
15 it's not going to change the outcome, but it's
16 something for -- to consider for Huntington in
17 general is that -- that comment that we
18 shouldn't use recent air samples to describe
19 work early on. And an additional complication
20 is we do have -- one of those historical
21 numbers is -- says Reduction Pilot Plant.

22 (Unintelligible) say number for the Reduction
23 Pilot Plant, and that's lower -- that value was
24 lower than the value (unintelligible) TBD, so I
25 don't know where that's coming out at, but it's

1 -- it's -- I can understand the comment and I
2 don't dispute the -- the logic of the comment.

3 **MR. TOMES:** This is Tom Tomes (unintelligible)

4 --

5 **THE COURT REPORTER:** I'm sorry, I can't hear
6 that.

7 **MR. TOMES:** This is Tom Tomes. I just want to
8 add one thing to that. Looking at data and the
9 very highest results of the dataset there was
10 actually some data (unintelligible) --

11 **THE COURT REPORTER:** Okay, I'm not
12 understanding you.

13 **MS. MUNN:** And I couldn't understand that,
14 either, Joe.

15 **MR. TOMES:** The very highest result for the
16 dataset for the nickel concentration that was
17 used was actually a result of (unintelligible)
18 grouped collectively together called the
19 refinery which included the data that was done
20 prior to AEC operations which for
21 (unintelligible) which had been torn out of the
22 plant, so there's (unintelligible) some
23 questions of which data is really most
24 appropriate to use.

25 **DR. H. BEHLING:** Okay, I think that concludes

1 case #2 then. I think probably everybody's in
2 need of a short break here. We're going to
3 break for lunch and also give everybody a
4 chance to go wash up or whatever. And
5 hopefully we'll be back here in -- I'll say a
6 half-hour. We'll keep the phone lines open,
7 but we'll resume in about a half-hour, if
8 that's okay with everybody. Wanda, is that all
9 right?

10 **MS. MUNN:** I can handle that. That's fine.

11 **THE COURT REPORTER:** Dr. Behling --

12 **DR. H. BEHLING:** Yes.

13 **THE COURT REPORTER:** -- this is Ray. Are you
14 saying I should just leave the phone exactly as
15 it is right now?

16 **DR. H. BEHLING:** Yeah, I think the -- I would -
17 - (unintelligible) this morning's fiasco --

18 **THE COURT REPORTER:** I agree.

19 **DR. H. BEHLING:** -- the line open and we'll
20 just keep our language clean here.

21 **MS. MUNN:** Hard for me to do, but I'll try.

22 **DR. H. BEHLING:** Okay.

23 **THE COURT REPORTER:** Thank you.

24 (Whereupon, a lunch recess was taken from 12:55
25 p.m. to 1:35 p.m.)

1 **DR. H. BEHLING:** We're ready to go. All I'm
2 now waiting for is my wife, who has control of
3 the screen here, but perhaps we can -- we can
4 start. We are starting out with case #6, which
5 is a Hanford case. And again Stu will start
6 the conversation with issue number one, and I
7 will respond. As I've said, you will not have
8 the benefit of seeing some of the slides that
9 will be presented in behalf of some of the
10 issues that are being raised. But as I said,
11 we will forward to you a copy of those at some
12 later point in time.

13 **MS. MUNN:** Thank you.

14 **DR. H. BEHLING:** Stu, do you want to start out
15 then?

16 **MR. HINNEFELD:** Okay.

17 **PRESENTATION/DISCUSSION OF ISSUES FOR CASE #6**

18 **MR. HINNEFELD:** As Hans said, this was a
19 Hanford case. The original -- or the first
20 issue, number one, on case #6 is a comment that
21 the measured dose component in the dose
22 reconstruction was entered at a constant value
23 rather than a normal distribution. And our --
24 our view of that was that for this particular
25 dose reconstruction approach there was an

1 overestimating approach used by assigning an
2 organ dose correction factor of one to what
3 would normally be a range of smaller numbers.
4 So organ dose conversion factors for the
5 appropriate organ here -- which looks like it's
6 the colon -- the higher ran-- the organ dose
7 correction factors are triangular distributions
8 of values, and for this particular target organ
9 the entire range of that triangular
10 distribution is less than one. And so based on
11 that, one would consider it an overestimating
12 dose conversion factor and therefore
13 (unintelligible) the dose was considered to be
14 lower than the value reported on the dose
15 reconstruction (unintelligible) as a constant
16 (unintelligible) approach. So that...

17 **DR. H. BEHLING:** In our write-up we did in fact
18 acknowledge the fact that a DCF -- a generic
19 DCF value of one, a single value, was obviously
20 a conservative approach and we fully recognize
21 it. And in our write-up we wrote NIOSH's
22 report of dose reconstruction stated that those
23 exposure geometry and radiation energy values
24 were selected to maximize the dose, but to
25 ensure that the dose estimate had been

1 maximized, an organ dose conversion factor or
2 DCF of one has been applied to both photons and
3 neutrons. And also to maximize the probability
4 of causation, a photon energy range of 100
5 percent between 30 and 250 keV was applied.

6 Now the issue -- and this is -- requires some
7 explanation on my part, and I will elaborate a
8 little longer on this one because it's an issue
9 that repeats itself over several of the cases,
10 and so the next time around we won't take as
11 much time. But I do want to take a couple of
12 minutes here to elaborate as to why we believe
13 that, in addition to a generous DCF value of
14 one, it does not preclude the use of
15 uncertainty. And then let me just back up so
16 that everyone understands.

17 When we have a dosimeter dose that is measured
18 either by film or by TLD, we know that that is
19 not an absolute number. And there has been
20 obviously recognition of the fact that in some
21 instances either a film or a TLD may
22 underestimate the exposure. And in order to
23 account for a upper bound value, we would
24 assign an uncertainty. We know, as I said,
25 that these film or TLDs, over a period of time,

1 have a certain amount of uncertainty associated
2 so that when the film reads out an exposure of
3 let's say 200 millirem, we know that it could
4 be as high as up to even twice that amount,
5 based on the uncertainty by which the film
6 responds to radiation. And so as a general
7 rule in OCAS Implementation Guide One there is
8 a strong directive to always identify the
9 uncertainty for individual film dosimeters and
10 TLD.

11 It is not necessary -- exclusive to use a
12 higher DCF in combination with an uncertainty,
13 and in that case you would -- you would
14 obviously assume that the uncertainty is
15 justified and the DCF is generous, in a sense,
16 where a higher than normal DCF is used. In
17 this case the DCF, the recommended single value
18 for the dose conversion value in -- involving
19 this particular cancer -- and we're talking
20 here colon cancer -- the values that could have
21 been used as a central value was a DCF of
22 0.747. In other words, approximately 25
23 percent less than the value of one that was
24 generically assigned.

25 Now the question is -- and we agreed that the

1 DCF of one overestimates the exposure and we
2 recognize that in most cases this maximizing of
3 dose is usually used to -- to give the benefit
4 of doubt to the claimant. But in -- this does
5 not preclude the use of an uncertainty value,
6 and then I'm going to show you -- unfortunately
7 for both of you, you will not have access to it
8 -- multiple documents at which -- which suggest
9 that the -- a DCF of one or greater is not
10 incompatible or excludes the use of -- of an
11 uncertainty. And -- and unfortunately you're
12 not going to be able to see this, but I'm going
13 to point out to -- a couple of slides --
14 Kathy, can you maybe work this for me?
15 And the first one is ORAU Procedure 0006, and
16 in that procedure there is an attachment D-2
17 that --in fact -- the next one -- well,
18 actually the first slide I wanted to show you,
19 and I want to just elaborate momentarily of the
20 requirement to do a -- an uncertainty
21 calculation. And the reason I'm willing to go
22 through this is because it has some very, very
23 profound impact on this whole process. Both in
24 the Implementation Guide One and in ORAUT-PROC-
25 0006 there is a very -- a lengthy description

1 about how to do the uncertainty or assign an
2 uncertainty to individual measured doses,
3 either from film or TLD. And I have to say
4 this, and then I'm saying this probably more in
5 behalf of task three, that this procedure is
6 very complex, very time-consuming, and at this
7 point in time, having reviewed the first 20
8 cases, not one dose reconstructor has opted to
9 use this, because it is very difficult to do.
10 And I suspect the reason we haven't seen it is
11 no one knows how to do it or knows how -- what
12 numbers to use to apply to this formula. And
13 that occurred in section 6.1.1.2. It is a
14 generic formula. And in fact, you're supposed
15 to do an uncertainty for each and every single
16 dosimeter that was ever assigned to an
17 individual, which in some cases early on
18 involved film dosimeters that were changed out
19 weekly. Which means that for a single year's
20 dose you should be in a position to assess the
21 uncertainty of 52 -- possibly as many as 52
22 film dosimeters and then collate that
23 uncertainty to a single equation and then
24 assign that as an annual dose as
25 (unintelligible) to the IREP. I have not seen

1 this, and I fully understand why; the dose
2 reconstructors have (unintelligible) boycotted
3 this as an issue. It is complex. It is
4 difficult. And the values that are being asked
5 for in putting in this uncertainty are not
6 available, especially for TLD. It says for
7 (unintelligible) of N and (unintelligible) of
8 U, call the DOE (unintelligible) lab or
9 (unintelligible) lab experts to get these
10 values. And of course it's questionable even
11 that these values apply because
12 (unintelligible) lab accreditation for many
13 facilities weren't even done until the late
14 '80's or early '90's, and we're applying these
15 sigma* values which are part of this equation
16 into a TLD system that may have been as early
17 as 1970. And so I have to raise this as a
18 central question. That is, is it reasonable to
19 even expect people to do this uncertainty as
20 opposed to assigning a simple number that says
21 multiply times 1.5, because in my estimation,
22 having looked at all of the different
23 documents, the idea of un-- calculating
24 uncertainty on behalf of someone who may have
25 worked at a DOE facility for 30 years involving

1 old two-element film dosimeters, four-element
2 film dosimeters, TLDs -- most recent is a
3 Panasonic -- is an unbelievable chore and is
4 next to impossible. So I will go on record in
5 saying that the need to calculate uncertainties
6 is basically impossible for a dose
7 reconstructor to do in a credible fashion and
8 explains probably why people have elected not
9 to apply uncertainties to dosimeters involving
10 film or TLD.

11 Now having said that, I will say that
12 uncertainty is still nevertheless something we
13 should incorporate, perhaps in a simplified
14 fashion, and does not -- is not precluded by an
15 -- a favorable dose conversion factor, which in
16 this case was assigned to a value of one or
17 greater.

18 And let me go to the next slide because I will
19 show you what ORAU's Procedure 0006 basically
20 asks you to do. This is -- was the first page,
21 and unfortunately we can't really see it, but
22 under bullet three I will simply read it to
23 you. In general, this instruction applies a
24 maximizing assumption for both recorded and
25 potentially unrecorded doses to ensure that the

1 covered employee's dose and probability of
2 causation are not underestimated. And it goes
3 on and on, but it's on the next page, which is
4 the next slide, in section four of ORAUT-PROC-
5 0006 where you see a -- the series of things
6 that are to be included for assigning dose and
7 -- and inclusive of uncertainty, and I'm
8 pointing to section 5.2. And 5.2 says examine
9 attachment B, and attachment B contains dose
10 conversion values, and select the maximum
11 possible DCF for the organ of interest for any
12 exposure geometry. And as you know, for some
13 types of exposures, the DCF may even be greater
14 than one, but it says if less than one, assign
15 a DCF of one, which is exactly what they did in
16 behalf of case #6.

17 Now as you go further down the line, down into
18 section 5.4, it says apply appropriate
19 uncertainty factor. Now what that tells me is
20 that the explanation I was offered -- that is
21 because we use a DCF of one or greater
22 precludes the need for uncertainty is not
23 necessary prescribed in this procedure. That
24 is the central point.

25 Now that's not the only one. Let me go to the