1 used for the prostate. The prostate was the
2 target for the cancer type in this case.
3 The ICRP references and IMBA do not have
4 prostate listed as a specific target organ,
5 so in these instances we choose surrogate
6 organs, and it's not always the same
7 surrogate for internal versus external
8 exposure. At the time the dose
9 reconstruction was done the surrogate organ
10 we were using for the prostate was the
11 testes, but the organ for the internal
12 exposure is highest non-metabolic, that's
13 used for the prostate for internal exposure.
14 So it's not the testes in every case. But
15 it was the testes for external exposure at
16 the time this one was done.
17 It seems that in reading there's a sentence
18 in the dose reconstruction that says the
19 testes were used as the surrogate organs for
20 external exposure. It may not clearly state
21 what was used for the internal surrogate. I
22 don't recall exactly whether it states it or
23 not. But highest non-metabolic is the
24 standard target organ for internal dose for
25 the prostate. That's what we used in every

1 case. So we did want to make that point
2 that the external dose surrogate was the
3 testes, and the internal, and the highest
4 non-metabolic was considered the colon,
5 which is the common default for highest non-
6 metabolic, so the colon was actually the
7 target organ for the internal, the surrogate
8 that was used for the internal dose.
9 **DR. H. BEHLING:** In looking at it now we
10 kind of agree, but let me just make a couple
11 of points here. When we first looked at
12 that worksheet, which is very nice and very
13 simple to use, internal code that allows you
14 to simply enter the period of time, the
15 exposure, and gives you a quick assessment
16 for a hypothetical internal exposure. It's
17 very difficult at times to identify the
18 proper surrogate for tissues -- or organs
19 that are not listed, and actually since
20 Kathy is my computer expert here I didn't do
21 it but she can perhaps talk about it. She
22 had to go through each and every one of the
23 organs to figure out which one was the
24 highest one. And if you do in fact select
25 testes, you get a dose of 25 rem, which is

1 more than double the assigned colon dose as
2 a surrogate and I think what this individual
3 -- I didn't do this particular review -- he
4 must have obviously taken the testes and
5 realized the dose was considerably higher
6 than the assigned value of 12. Since that
7 time this particular worksheet has been
8 amended again to now include the prostate,
9 so you'll have to use a surrogate organ and
10 of course under the new approach and
11 revised, amended worksheet where you can
12 enter the prostate as the target and not
13 have to worry about selecting a surrogate,
14 the dose is now reduced to 10.5 rem which is
15 almost two rems less than the surrogate
16 value of the colon, so again we're talking
17 about a dynamic system here that gets
18 amended by the day and sometimes gets to be
19 very confusing to people who say well,
20 better check to see whether or not a new
21 organ has been added to the worksheet.
22 Obviously the need for surrogate organ
23 tissue. And I guess this is the reason why
24 we had initially the concern about the use
25 of testes -- It wasn't clear actually why

1 testes are considered metabolic, but I guess
2 spermatogenesis may have something to do
3 with higher uptake of radionuclides, are
4 part of the list of nuclides under the
5 hypothetical case, and therefore there is
6 some metabolic uptake that exceeds other
7 tissues in question. So again, our reviewer
8 probably wasn't aware of some of these
9 nuances and selected testes, which we admit
10 is the wrong one. But in most recent times
11 we can now run prostate as its own organ of
12 concern.
13 **MR. HINNEFELD:** You said that very well -- I
14 mean there are certainly nuclides in
15 (unintelligible) component of some type
16 (unintelligible) testes. And so because of
17 that the testes dose has been quite a bit
18 higher than the non-metabolic organs. And
19 as you said a hypothetical (unintelligible)
20 nuclide intake, so top of those do in fact
21 have some uptake in (unintelligible).
22 **DR. H. BEHLING:** So I think we have to amend
23 that and assume our assessment was wrong.
24 We will acknowledge the fact that as of
25 today we do have the prostate as a organ

1 that no longer requires the use of the
2 surrogate tissue, for future assessments.
3 **MR. HINNEFELD:** Issue Number Three is the
4 intentional overestimate of the medical
5 exposure. Again -- Number two was the issue
6 we just talked about, right?
7 **DR. H. BEHLING:** Yes.
8 **MR. HINNEFELD:** Number two was the issue of
9 the testes as the -- Well, we kind of went
10 into -- One and two are sort of --
11 **DR. H. BEHLING:** Yes, one and two are pretty
12 much the same.
13 **MR. HINNEFELD:** Issue Number Three is the
14 again the intentional overestimate by
15 choosing an organ dose, a maximizing organ
16 dose for medical exposure rather than the
17 true target dose we talked about on several
18 cases.
19 And Issue Number Four --
20 **DR. H. BEHLING:** Let me just comment --
21 **MR. HINNEFELD:** Again? We haven't talked
22 about this enough?
23 **DR. H. BEHLING:** I know. But here we just
24 wanted to point out the differences in
25 values because I did look at the Catherine

1 report and came to the realization that
2 Catherine will tell you that the dose for
3 the testes is 1.0, each (unintelligible) six
4 rem which will give you one one-thousandths
5 of a millirem. And just basically just
6 forget it, you know, and here we assigned a
7 total of 83 millirem that was subsequently
8 also multiplied times 1.3, so we're talking
9 about the difference between a hundred rem
10 versus one one-thousandth of a millirem.
11 And again the question is should we use
12 something that is so outrageously different
13 by orders of magnitude?
14 **MS. MUNN:** No.
15 **MR. HINNEFELD:** Right, I know we had talked
16 about it. Maybe now we've talked about it
17 enough. Okay, Issue Number Four on Case 20
18 is the same issue as Case Number 16 where we
19 had the discussion about the factor of two
20 for those of you -- Yeah, factor of two, you
21 apply the factor of two where
22 (unintelligible) chose a missed dose. It's
23 the same issue that we talked about there.
24 I want to when you get back look at the
25 procedure, I'll probably call Hans so we can

1 understand you know where are we reading the
2 various things in the procedure and try to
3 get an understanding of that.
4 **DR. H. BEHLING:** Except this one was the
5 OTIB0008, where the last one was OTIB0010,
6 one was film, one was TLD, and they misused
7 and misinterpreted that table. I think it
8 needs to be stated that the CC, or
9 conversion correction factor of two only
10 applies to recorded dose and not to be used
11 in combination with LOD and the monthly
12 cycle --
13 **MR. HINNEFELD:** The way that table is laid
14 out would probably lead someone to see that
15 table as (unintelligible) after reading this
16 whole big confusing thing, okay here it is.
17 But the table is laid out in contradiction
18 of what he says.
19 **DR. H. BEHLING:** Yes, if you read the
20 preceding paragraphs, it clearly states that
21 the CC or conversion correction factor of
22 two is to be applied to measured dose, it
23 has nothing to do with missed dose. And of
24 course that's a mistake I made too when I
25 first looked at it. I thought you could say

1 LOD times two, which is four times greater
2 than LOD over two.
3 **MR. HINNEFELD:** Right.
4 **DR. H. BEHLING:** So I realized I too was the
5 victim of misinterpreting that thing, but
6 after rereading it multiple times I realize
7 that this error was committed by both of
8 these two guys and in fact they must have
9 been sitting in the same room together
10 because they committed the same errors and
11 used the same words so --
12 **MR. HINNEFELD:** Well the words, the words
13 actually are boilerplate.
14 **DR. H. BEHLING:** Oh, is that right?
15 **MR. HINNEFELD:** They pop up over and over
16 and over (unintelligible) but it's still a
17 boilerplate description.
18 **DR. H. BEHLING:** Yeah, I think if both TIB-
19 0008 and -0010 are to be used, I think it
20 should be clarified to the world of dose
21 reconstructionists that there's a separation
22 between missed dose and dose of record and
23 that not all of those values and those
24 tables apply to missed dose.
25 **MR. HINNEFELD:** Well, I want to make sure I

1 understand exactly the terminology -- I'll
2 be talking to Hans about that so I can
3 understand exactly the point and I'll talk
4 to our guys as well, so we will resolve that
5 one.
6 **MR. GIBSON:** This is Mike Gibson. I have a
7 question on this one, too. I believe there
8 was some actinium down there, and this
9 person was, based on TIB-002 on this which
10 defines doses as having a single acute
11 inhalation of 28 radionuclides on the first
12 year of employment. You assume that an
13 intake of actinium on the first date of
14 employment what would the potential dose be,
15 and if it is actually a worst case scenario
16 for the dose?
17 **MR. HINNEFELD:** Well, I don't think actinium
18 is in the 28 -- Actinium is not one of the
19 radionuclides in the 28. I think that the
20 28 nuclide approach was intended to provide
21 a very large intake. It's a combination of
22 28 radionuclides that most of which were not
23 at Y-12. And so it's sort of a technique
24 for saying we don't -- we can't say with
25 confidence that this person's internal dose

1 is zero. We don't have any evidence based
2 on the records we have that he had any
3 internal dose, but we can't say with
4 confidence that he had zero internal dose.
5 So what can we do to kind of bracket it and
6 -- and the doses that result from the the
7 hypothetical intake are really large, I mean
8 these actual dose numbers that come out are
9 for non-metabolic organs, you know, organs
10 don't concentrate, keep materials at all.
11 (Unintelligible) blood and the radionuclides
12 being carried around in the blood, so these
13 -- if you were looking at the target organs
14 for any of these (unintelligible)
15 radionuclides on the list, these would be
16 huge, huge doses. These are big intakes
17 we're assigning. So our feeling is that
18 this kind of intake and this dose outcome
19 provides a lot of confidence that we have
20 bracketed the potential internal doses for
21 people. Even if there may have been a
22 specific radionuclide available in their
23 work place that's not on that list, we don't
24 think that there is a clerical likelihood
25 that there was such a big intake of those

1 radionuclides that it would be larger than
2 what is calculated by the hypothetical
3 intake. That's kind of the thought process
4 behind this approach.
5 **MR. GIBSON:** I guess my concern is if you
6 get an actinium exposure and you do a biopsy
7 sample within a few days, the minimum
8 detectable dose you'll see is three to four
9 rem, so if this guy had an acute intake of
10 some actinium on day one, how large could
11 that dose have been?
12 **MR. HINNEFELD:** Well, the actinium intake
13 dose report on that for that dose within a
14 few days was probably committed effective
15 dose equivalent which would include a
16 component to heavily radiated organs that
17 the person would have, whether that be the
18 lung or -- I don't even know the behavior of
19 actinium right now, but --
20 **UNIDENTIFIED:** Bone.
21 **MR. HINNEFELD:** Bone? So (unintelligible)
22 that three rem number you're talking about
23 is (unintelligible) effective number
24 probably is what could be missed by a
25 bioassay program and the bulk, or the

1 overwhelming, amount of that is based on the
2 dose to the certain metabolic organs. In
3 this particular person's case since the
4 target organ, or the organ where the cancer
5 developed, was (unintelligible) his
6 prostate, even those actinium intakes you're
7 talking about would result in very, very
8 small doses to the prostate, which is the
9 issue we're concerned about for the program
10 here is what was the dose to the targets.
11 And that's why we go through all these
12 convoluted organ dose calculations versus
13 using (unintelligible) effective, which is
14 essentially calculated by regulation. So I
15 understand your point. I can't -- it's not
16 on the 28 nuclide list. I guess our
17 position is that the intake, or the 28
18 nuclide intake is such a large intake in
19 total that we think we've bracketed the
20 potential exposures that this person could
21 have in their work.
22 **DR. H. BEHLING:** It might be different if in
23 fact the cancer in question was bone cancer.
24 **MR. HINNEFELD:** Right, and in fact we don't
25 use typically hypothetical intakes on bone

1 cancer or lung cancer or kidney cancer, so
2 we don't use the hypothetical -- the
3 hypothetical's really only used for non-
4 metabolic cancer sites.
5 Well, I've spoken more in the last two days
6 than I normally speak in two weeks, so I
7 don't propose to keep talking.
8 **DR. H. BEHLING:** I guess we'll go around and
9 see if anybody has any concluding comments,
10 remarks, questions or anything, before we
11 close up and hang up here. Wanda, do you
12 have anything that you want to add to the
13 record?
14 **MS. MUNN:** Nothing, except to thank all of
15 you for being so understanding about my
16 absence and trying to make sure I understood
17 through my ears what I did not have
18 available on my eyes yesterday, and to thank
19 Judy for getting the information to me that
20 she did.
21 **DR. H. BEHLING:** We appreciate your patience
22 and we certainly sympathize with having to
23 sit there with a phone glued to your ear, so
24 we appreciate your cooperation and
25 willingness to participate in absentia.

1 **MS. MUNN:** Well, this is pretty important
2 stuff.
3 **DR. H. BEHLING:** We appreciate your
4 willingness to forfeit a few hours of sleep
5 here.
6 **MS. MUNN:** Tomorrow comes sleep.
7 **DR. H. BEHLING:** Okay, great. Anybody else
8 have any comments you want to add to the
9 record?
10 **MR. GIBSON:** This is Mike Gibson. I'd just
11 like to thank Wanda for being what Hans
12 said, it's tough enough sitting here in the
13 room let alone trying to listen with a phone
14 glued to your ear, and for Ray, also, trying
15 to understand this via long distance. I'd
16 like to thank NIOSH and SC&A. I think it's
17 been a very productive meeting. I think
18 it's going to go a long way to help us get
19 some of these issues resolved so we can go
20 on and make some progress for the claimants.
21 **MR. HINNEFELD:** Yeah, this is Stu Hinnefeld.
22 I would just express my appreciation for
23 this kind of a process. I think this is
24 certainly constructive and helpful to us and
25 we're hopeful that our participation is

1 helpful to the process in general.
2 **DR. H. BEHLING:** Okay I guess with that
3 we'll conclude this meeting. And I
4 personally want to thank again, Ray, for his
5 patience in doing something that hopefully
6 he won't have to endure again. But we'll
7 close this meeting as of this moment. Thank
8 you.
9
10
11
12 (Whereupon, the proceeding was adjourned at 10:43
13 a.m.)
14

1 **C E R T I F I C A T E**

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 12th and 13th day of January, 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 3rd day of February, 2005.

Steven R Green

STEVEN RAY GREEN, CCR
CERTIFIED MERIT COURT REPORTER
CERTIFICATE NUMBER: A-2102