

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

convenes the

ADVISORY BOARD ON
RADIATION AND WORKER HEALTH

The verbatim transcript of the Meeting of the
Advisory Board on Radiation and Worker Health held
at The Garden Plaza Hotel, 215 South Illinois
Avenue, Oak Ridge, Tennessee, on May 19, 2003.

VOLUME I

C O N T E N T S

May 19, 2003

REGISTRATION AND WELCOME	
Dr. Paul Ziemer, Chair.	7
Dr. John Howard, Director NIOSH.	11
Mr. Larry Elliott, Executive Secretary	12
PROGRAM STATUS REPORT	
Mr. David Sundin, NIOSH - OCAS.	12
DOL PROGRAM STATUS REPORT	
Mr. Shelby Hallmark, DOL, OWCP.	43
RECENT IREP MODIFICATIONS AND RECOMMENDED UPDATES	
Mr. Brian Thomas, SENES Oak Ridge, Inc.	
Dr. Iulian Apostoaei, SENES Oak Ridge, Inc.	
.63
THE UK COMPENSATION SCHEME FOR RADIATION LINKED DISEASES	
Mr. Michael Lewis, Mr. Andy Slovak, Mr. John Billard, BNFL	
.81
WORKING GROUP REPORT: DOSE RECONSTRUCTION REVIEW PROCESS	
Mr. Mark Griffon	123
AWARD PRESENTATION	143
FUTURE CONSIDERATION OF UNCERTAINTY IN IREP	
Dr. Owen Hoffman, SENES Oak Ridge, Inc.	144
A REFRESHER AND UPDATE ON REF'S ASSUMED IN IREP	
Dr. David Kocher, SENES Oak Ridge, Inc.	173
NAS REPORT ON REVIEW OF DTRA DOSE RECONSTRUCTION PROGRAM	
Mr. Dennis M. Schaeffer.	204
BOARD DISCUSSION/WORKING SESSION: REVIEW PROCESS OF COMPLETED DOSE RECONSTRUCTIONS	226
PUBLIC COMMENT PERIOD	227
ADJOURN	263
COURT REPORTER'S CERTIFICATE	264

TRANSCRIPT LEGEND

The following transcript contains quoted material. Such material is reproduced as read or spoken.

In the following transcript a dash (--) indicates an unintentional or purposeful interruption of a sentence. An ellipsis (. . .) indicates halting speech or an unfinished sentence in dialogue or omission(s) of word(s) when reading written material.

In the following transcript (sic) denotes an incorrect usage or pronunciation of a word which is transcribed in its original form as reported.

In the following transcript (phonetically) indicates a phonetic spelling of the word if no confirmation of the correct spelling is available.

In the following transcript "uh-huh" represents an affirmative response, and "uh-uh" represents a negative response.

In the following transcript "*" denotes a spelling based on phonetics, without reference available.

In the following transcript (inaudible) signifies speaker failure, usually failure to use a microphone.

P A R T I C I P A N T S

(By Group, in Alphabetical Order)

BOARD MEMBERS

CHAIR

ZIEMER, Paul L., Ph.D.
Professor Emeritus
School of Health Sciences
Purdue University
Lafayette, Indiana

EXECUTIVE SECRETARY

ELLIOTT, Larry J.
Director, Office of Compensation Analysis and Support
National Institute for Occupational Safety and Health
Centers for Disease Control and Prevention
Cincinnati, Ohio

MEMBERSHIP

ANDERSON, Henry A., M.D.
Chief Medical Officer
Occupational and Environmental Health
Wisconsin Division of Public Health
Madison, Wisconsin

ANDRADE, Antonio, Ph.D.
Group Leader
Radiation Protection Services Group
Los Alamos National Laboratory
Los Alamos, New Mexico

DeHART, Roy Lynch, M.D., M.P.H.
Director
The Vanderbilt Center for Occupational and Environmental
Medicine
Professor of Medicine
Nashville, Tennessee

ESPINOSA, Richard Lee
Sheet Metal Workers Union Local #49
Johnson Controls
Los Alamos National Laboratory
Española, New Mexico

GIBSON, Michael H.
President
Paper, Allied-Industrial, Chemical, and Energy Union
Local 5-4200
Miamisburg, Ohio

GRIFFON, Mark A.
President
Creative Pollution Solutions, Inc.
Salem, New Hampshire

MELIUS, James Malcom, M.D., Ph.D.
Director
New York State Laborers' Health and Safety Trust Fund
Albany, New York

MUNN, Wanda I.
Senior Nuclear Engineer (Retired)
Richland, Washington

OWENS, Charles L.
President
Paper, Allied-Industrial, Chemical, and Energy Union
Local 5-550
Paducah, Kentucky

PRESLEY, Robert W.
Special Projects Engineer
BWXT Y12 National Security Complex
Clinton, Tennessee

ROESSLER, Genevieve S., Ph.D.
Professor Emeritus
University of Florida
Elysian, Minnesota

STAFF/VENDORS

CORI HOMER, Committee Management Specialist, NIOSH
STEVEN RAY GREEN, Certified Merit Court Reporter

AUDIENCE PARTICIPANTS

ADLER, TIM
AHRENHOG, STEVEN
APOSTOAEI, A. IULIAN
BECK, WM. L.
BELL, GLENN
BILLARD, JOHN
BOGARD, RHONDA
BRASWELL, TODD
BROCK, DENISE
BROOME, GINA
DEHART, JULIA
FOLEY, PHILLIP
GADOLA, SALLY
HALLMARK, SHELBY
HENSHAW, RUSS
HILL, JEFF
HINNEFELD, STU
HOFFMAN, OWEN
HOMOKI-TITUS, LIZ
HOWARD, JOHN
HUFF, JENNIFER
JESSEN, KARIN
KATZ, TED
KOCHER, DAVID
LAWSON, BRUCE
LAWSON, JACOB HOWARD
LEWIS, MICHAEL
LOURD, PATRICK C
MARTIN, FAY M.
MILLER, RICHARD
NETON, JIM
POTTER, HERMAN
POWELL, STEVE
PRESLEY, LOUISE
SCARBROUGH, CARL
SCHAEFFER, D.M.
SCHALENTER, JANE
SLOVAK, ANDY
SOULEYRETTE, MICHAEL
STEWARD, JOHN
SUNDIN, DAVE
TABOR, BOB
TANKERSLEY, BILL
THOMAS, BRIAN
TOOHEY, R E

TURCIC, PETE
YIIN, JAMES
ZIEMER, MARILYN

P R O C E E D I N G S

(9:10 a.m.)

REGISTRATION AND WELCOME

CHAIR

DR. ZIEMER: Good morning, everyone. I'm going to call the meeting to order. This is meeting 16 of the Advisory Board on Radiation and Worker Health. My name is Paul Ziemer and I serve as Chair of the Board. Let me begin by welcoming all of you to Oak Ridge, and I feel I can do that in a valid way since this is my old stomping ground. I spent the first year of my marriage actually here in Oak Ridge, and last night Marilyn and I drove up to the old apartment. I don't think I'd want to live there anymore. I don't think they've painted it since we left, many years ago. In any event, welcome to Oak Ridge. It's great to have all of you here, some local folks as well as those who've come from out of town. We'd like to remind you to, if you haven't already done so, to please register your attendance with us this morning. There's a registration book back on the table

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22

1 where Cori Homer is standing back there, and we ask
 2 that all of you register, whether you're Board members,
 3 staff, government staff people, members of the public
 4 or others.

5 Also if you are a member of the public and wish to
 6 participate in the public comment period later today,
 7 we ask that you sign up so that we have some idea of
 8 how many do wish to address the Board during that
 9 public comment period.

10 I'm not going to introduce the Board members to those
 11 who are observers, but the Board members names are on
 12 the placards, so you can see who they are. I see that
 13 there is an empty seat. Is Mike Gibson not going to be
 14 here today?

15 **MR. ELLIOTT:** He's here somewhere.

16 **DR. ZIEMER:** He's here somewhere. Okay, so the record
 17 will show hopefully at some point that we have a full
 18 attendance of the Board. And also, as Board members or
 19 other speak, we do ask that you identify yourself so
 20 that the recorders are able to make a record of that as
 21 the transcript is prepared.

22 There are a number of items on that table over here on

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22

my left which include everything from the charter of this Committee to minutes of past meetings and other documents. So if you are interested in any of those, we invite you to make yourself -- or help -- help yourself to those, and I'm walking around looking for a piece of paper that I set aside. But if there are documents that you wish, those are all available. Help yourself to those.

We have a special privilege this morning and a special guest that I want to introduce, and that is Dr. John Howard. Dr. Howard is the Director of the National Institute for Occupational Safety and Health, NIOSH, and we're very pleased that he is with us this morning.

Prior to becoming Director for NIOSH, Dr. Howard served as chief of the Division of Occupational Safety and Health in California's Department of Industrial Relations, a position he held since 1991 until his more recent appointment as Director of NIOSH. In that capacity in California he headed up an occupational and public safety program that involved a staff of nearly 1,000, so quite a large operation there.

Prior to his appointment as NIOSH Director, Dr. Howard

1 also was an assistant professor of environmental and
2 occupational medicine at the University of California
3 at Irvine, and he's also served as medical director and
4 chief clinician of the Philip Mandelker AIDS Prevention
5 Clinic, which is an AIDS community clinic in Los
6 Angeles. He's also been assistant counselor to the
7 Undersecretary of Health and Human Services.

8 Dr. Howard began his career in occupational health as
9 an internist for the University of California, Los
10 Angeles School of Medicine on a pulmonary fellowship
11 program at Cedars-Sinai Medical Center in Los Angeles,
12 and during his clinical work he worked very closely
13 with asbestos-related situations, particularly
14 asbestos-exposed shipyard workers, and his work has
15 been published on occupational lung disease related to
16 asbestos exposure.

17 He did his doctoral work in medicine at Loyola
18 University and has a Master's in occupational health
19 from the Harvard School of Public Health, and has other
20 academic degrees and many other credentials that I
21 won't go into today. In fact, already my introduction
22 is probably longer than what he's going to say because

1 he's going to simply give us a brief greeting. So with
2 that, Dr. Howard, welcome and we're very pleased to
3 have you with us today.

4 **DIRECTOR NIOSH**

5 **DR. HOWARD:** Thank you, Dr. Ziemer, and it is -- your
6 introduction is definitely longer than what I was going
7 to say. I just wanted to express my appreciation for --
8 -- for all of the work that you do here on the Board.
9 When I first came to my job in July, I received
10 periodic e-mails about your meetings, and I thought
11 after the fourth or fifth one in rapid succession, I
12 thought my, these people actually do work. And so I
13 just want to compliment you on your dedication and
14 professionalism and all the hard work you're doing with
15 this program, and to assure you that, even though I've
16 been very tardy in getting here to one of your
17 meetings, I'm very interested in what I'm going to
18 learn in the next two days. And certainly I've been
19 exposed to all the issues that you all are struggling
20 with through -- through Larry and others in the
21 program. So I just want to say that you have the full
22 support of the Institute and the Institute leadership,

1 as well as the Department of Health and Human Services
2 in the work that you're doing.

3 So thank you for having me here today and I hope to
4 learn a lot over the next couple of days. Thank you.

5 **DR. ZIEMER:** Thank you again, Dr. Howard. We also
6 provide an opportunity for Larry Elliott from -- our
7 Executive Secretary, to make any opening comments. And
8 Larry, if you have any, this is the time.

9 **EXECUTIVE SECRETARY**

10 **MR. ELLIOTT:** Thank you. I just want to welcome
11 everybody to Oak Ridge. It's nice to see a good crowd,
12 and I look forward to a productive two days. And I
13 hope everyone has an interesting and informative two-
14 day meeting. Thank you.

15 **DR. ZIEMER:** Now we're going to turn our attention to
16 our regular program status report. Dave Sundin of the
17 NIOSH staff is here with us again, and Dave, if you'll
18 come -- there he is -- and present your summary to us.

19 **PROGRAM STATUS REPORT**

20 **MR. SUNDIN:** Is the podium mike on, the lavalier? Can
21 you hear me back there?

22 Well, I'll also say good morning and welcome to

1 beautiful Oak Ridge. I think this is probably the 13th
2 face-to-face meeting. Paul mentioned 16 meetings, I
3 believe is the count, counting the teleconferences.
4 But in any case, clearly an active Board.

5 I wanted to present a brief overview of the program
6 status. I'll use the basic approach that we've used in
7 previous meetings.

8 Department of Labor has transferred over 12,000 cases
9 to NIOSH for dose reconstruction since we began
10 receiving cases in October of 2001. Actually close to
11 13,000 by now. These statistics are as of last Friday.
12 As you're probably aware, we continue to send a letter,
13 a fact sheet, a brochure and a refrigerator magnet to
14 each claimant, to let them know that we've received
15 their claim. And we also explain to them in those
16 materials what dose reconstruction is and how they can
17 contact us to monitor progress. Recently we've
18 modified this initial contact letter to include the
19 name of a specific public health advisor who is
20 available to provide specific information on their
21 claim. The letter now also introduces and explains
22 ORAU's role in the process, and we provide the ORAU

1 toll-free telephone number.

2 Of course we log each case into our computerized claims
3 tracking system. We electronically scan all the
4 documents in each case file, and we also create and
5 maintain a paper file system. We've been making some
6 significant improvements, and in particular recently,
7 some improvements in our database management systems
8 and connections to permit us to operate more
9 efficiently and exchange information appropriately with
10 ORAU, our contractor.

11 You can see that the majority of claims involve
12 employees who worked at DOE sites, but about 16 percent
13 involve employment at Atomic Weapons Employer sites, or
14 AWE's.

15 This chart shows the rate at which we've been receiving
16 cases from the four district offices of DOL by month.
17 The number of cases peaked at 1,031 in August of 2002
18 and has trended generally downward since then. I think
19 it's probably too early to determine whether this is a
20 short or a long-term trend, however.

21 Each case file we receive from DOL does list the
22 verified covered sites where the Energy employee

1 worked, and so we use this information to direct our
2 requests for radiation exposure information to the
3 appropriate DOE points of contact. In some cases, of
4 course, the employee may have worked at several covered
5 facilities. We're usually able to issue these requests
6 for DOE exposure information within two weeks of
7 receipt of the case from the Department of Labor.
8 We've sent out nearly 12,000 requests for personal
9 radiation exposure information to our DOE points of
10 contact, and we've received responses to 63 percent of
11 these requests. Some of these responses we know
12 contain incomplete information, which means that
13 follow-up requests to DOE for additional information
14 will be required before dose reconstruction can proceed
15 in those cases. About 20 percent of our requests are
16 more than 60 days outstanding, and these cases are
17 highlighted in a periodic e-mail status report that we
18 send to each of the DOE points of contact and the DOE
19 Office of Worker Advocacy.

20 This table shows how many requests for personal
21 exposure information are going to I guess what you'd
22 call the Big Eight DOE offices, and how many responses

1 we've currently received. And as you can see, the Oak
2 Ridge operations office has received more requests and
3 provided more responses than any other DOE office by a
4 considerable margin, almost two, two and a half times,
5 perhaps, of the -- as the Savannah River site.

6 We continue to work closely with DOE's Office of Worker
7 Advocacy and the designated points of contact at the
8 sites to ensure that we get the kind of exposure
9 information needed to conduct dose reconstructions in a
10 timely manner. And I will say that DOE has facilitated
11 our participation in periodic teleconferences with
12 their points of contact and the records retrieval staff
13 at each of the sites, and they have also taken specific
14 steps to add resources and improve the processes at
15 certain sites.

16 As you probably know, a telephone interview is offered
17 to each claimant to permit them to add information
18 which may be relevant to reconstructing the radiation
19 dose, and the award of our support contract has
20 substantially increased our capacity to conduct
21 interviews. And until a recent office move temporarily
22 interrupted the work of the interviewers, or at least

1 slowed it down, their monthly production was climbing
2 steadily. As of today we've conducted interviews with
3 more than 2,600 employees and survivors. This chart, I
4 should say, doesn't include a significant number of
5 interviews that actually were conducted in April and
6 May and which will be logged into our system when the
7 interview group gets reconnected.

8 We have conducted several secure interviews using
9 appropriately-cleared interviewers in a secured
10 location to address concerns raised by the claimants.
11 I am happy to be able to report to you that the number
12 of completed dose reconstructions being sent back to
13 Department of Labor for final adjudication is steadily
14 increasing. Nearly 300 cases are currently assigned to
15 a health physicist for dose reconstruction, and draft
16 dose reconstruction reports have been sent to claimants
17 in 137 cases. Seventy-three of those have been
18 approved by the claimants and returned as final dose
19 reconstructions, including a complete -- and have been
20 sent to Department of Labor, along with the complete
21 administrative record. Six of those final cases
22 represent claims from Oak Ridge.

1 While we know that every performance measure is
2 significant in this program, we're particularly pleased
3 to see the number of completed dose reconstructions and
4 dose reconstructions assigned actually begin to rise.
5 We know we've got a ways to go before we achieve the
6 more than 200 dose reconstructions per week target that
7 we need to actually begin to make progress against our
8 current backlog, but we feel like we're on the path and
9 making progress.

10 We want claimants to be able to contact us, and they
11 continue to do so. The number of phone calls received
12 in OCAS has increased substantially each quarter as we
13 receive more and more claims. We're currently
14 receiving approximately 80 phone calls per day, and
15 we've responded to nearly 30,000 calls since the
16 program was launched in October, 2001. Some of those
17 calls are related to setting up and actually conducting
18 interviews, but the majority of them really are
19 claimants and their representatives checking on a claim
20 status.

21 Our web site continues to be a valuable source of up-
22 to-date information about the program and a vehicle for

1 communication with claimants and others interested in
2 EEOICPA. We've received over 1,600 claim-related e-
3 mails, and our goal is still to respond to every one of
4 them within 24 hours.

5 I'd like to draw your attention to some recent
6 developments and accomplishments which I think are
7 worth noting. Our Memorandum of Understanding between
8 HHS and DOE was signed by the Deputy Secretaries of
9 both Departments on April 4th, 2003, and that document
10 is available on both the DOE and HHS-OCAS web site for
11 your review.

12 As you know, the public comment period for our proposed
13 Rule for adding classes of employees to the SEC closed
14 on May 6th. And in addition to the Board's comments,
15 the Docket Office received comments from 16 other
16 groups and individuals and we're now considering all
17 those public comments.

18 DOE has periodically asked that we appoint additional
19 physicians to their physician panels which have a role
20 in evaluating claims under Subtitle (D) of EEOICPA. We
21 recently transmitted a list of 33 additional physicians
22 to DOE, which brought the total number of appointed

1 physicians to nearly 80, and we will be appointing
2 approximately 30 more physicians soon, and will
3 continue the process of seeking out and identifying
4 qualified candidates for these panels.

5 In late March OCAS approved a Technical Basis document
6 which had been developed by ORAU which established the
7 basis for developing an exposure matrix for the
8 Bethlehem Steel Corporation in Lackawanna, New York.
9 This document, which is also available on our web site,
10 will permit us to complete virtually all of the
11 approximately 435 Bethlehem Steel claims.

12 Also, and this is not news to most, a solicitation for
13 proposals has been issued for contract technical
14 support to the Board's review of the NIOSH dose
15 reconstruction program following a pre-proposal
16 conference which some of you attended in Cincinnati on
17 April 30th. These proposals are due in the NIOSH
18 contract office I believe May 28th.

19 And we continue to add the staff necessary to achieve
20 the numerous tasks which are in front of us. OCAS
21 currently has 35 employees in Cincinnati and three
22 additional staff assigned to support our efforts from

1 Atlanta and Washington, D.C. We are in the process of
2 recruiting to fill a few remaining vacancies. ORAU
3 currently has more than 170 full-time equivalents on
4 their staff.

5 As required under our contract with ORAU, we've
6 negotiated production goals as part of our plan to
7 reduce the backlog of claims which are awaiting dose
8 reconstruction, and this plan calls for completion of
9 nearly 6,000 draft dose reconstruction reports this
10 calendar year, and that's through developing a capacity
11 to produce a minimum of 200 dose reconstructions per
12 week by July.

13 So I thank you for your attention. I'll try to answer
14 any questions you might have at this point.

15 **DR. ZIEMER:** Thank you very much, Dave. Let me begin
16 by asking a question of the third slide, which is cases
17 received from DOL by month, and it has 2001, 2002 and
18 2003 in there, if you see that slide. It's a bar
19 graph.

20 **MR. SUNDIN:** Right.

21 **DR. ZIEMER:** I don't know if you can back up to it, but
22 it doesn't appear to me that there's enough months in

1 there to correspond to those years. Am I seeing
2 something here? It seems to me there ought to be
3 approximately 12 bars per years, if my advanced
4 mathematics are correct.

5 Okay, it's starting in mid-year, so the year is not --
6 the year's in the middle, I gotcha. Okay. Now I
7 should have figured that out.

8 **MR. SUNDIN:** So it runs from October 2001.

9 **DR. ZIEMER:** Either that or it's a Federal year or
10 something here. Okay. A leap year. So 2002 is
11 centered on -- so I can use any six bars to the right
12 and left and I've got a year. Is that what you're
13 saying?

14 **MR. SUNDIN:** January of 2002.

15 **DR. ZIEMER:** Okay. What I'm going to claim then is
16 2003 isn't centered on its year. It's -- okay.

17 **MR. SUNDIN:** I'd better re-graph this one.

18 **DR. ZIEMER:** Okay. Well, it wasn't clear what months
19 was there. Okay. Thank you.

20 Other questions? Yes, Jim.

21 **DR. MELIUS:** I have some questions on your progress
22 with the number of DOE sites. I don't happen to

1 remember all the numbers, but I think Savannah River,
2 Idaho, some of the other sites seem to have an awful
3 large percentage of claims that were -- or say
4 significant at over 150 days. What are you doing to
5 resolve those and how are you -- what are you doing to
6 sort of track progress and get those back on board?

7 **MR. SUNDIN:** Right. Well, the story behind each of
8 those sites is slightly different. We are working with
9 the Office of Worker Advocacy and the site personnel
10 themselves, but without going into a lot of detail, the
11 story at Idaho, for example, involves the need to index
12 a lot of records that simply have not been indexed so
13 we expect that once that sort of front-end task is
14 completed, then the rate at which we get responses will
15 increase a lot.

16 Pick another site, Jim. There is a story behind each
17 one of them and it's different.

18 **DR. MELIUS:** Savannah River, is that --

19 **MR. SUNDIN:** Yeah.

20 **DR. MELIUS:** -- one that you're having problems that
21 looks like it's maybe getting better?

22 **MR. SUNDIN:** It is.

1 **DR. MELIUS:** I don't remember --

2 **MR. SUNDIN:** It is, and that is exactly the story.
3 They were a little bit I guess -- shall we say slow
4 getting out of the blocks, but in terms of the kind of
5 responses we're getting from them now, we believe
6 they're reasonably complete and they have added
7 additional staff, in fact, to start being able to move
8 their output up. So I think there it was just a
9 question of them not getting started as early as some
10 others.

11 **DR. MELIUS:** And how do you communicate these issues to
12 the claimants? I mean 'cause you have -- I don't know,
13 say 1,000 or more claimants that are sitting there --
14 it's been close to six months where they've been just
15 basically not -- sitting there, the claims have.

16 **MR. SUNDIN:** Well, we always tell the claimants exactly
17 what the situation is, as best we understand it. And
18 we do tell them that the targets we establish for DOE
19 response is 60 days, and some sites are able to meet
20 that, some sites are not. We can tell each one of the
21 claimants exactly how many days that their response has
22 been with the DOE. We can tell them if we have gotten

1 a response, let them know that. But in terms of
2 providing -- and we also tell them what we know about
3 that particular site, what they're doing to help
4 improve that response.

5 **DR. MELIUS:** But do you proactively -- do you
6 communicate with them? I mean -- I mean a lot of these
7 people, you know -- it's a difficult process and if
8 they're sitting there -- they don't ask you what
9 happens, I guess is my -- my question.

10 **MR. SUNDIN:** Well, we have -- I mean there is some
11 information on our web site which sort of bears on this
12 issue. We haven't profiled each individual site's
13 response profile like this on our web site, and we have
14 not gone out with mailings to claimants to sort of keep
15 them updated. We're considering that, but -- so it is
16 on a case-specific basis as people call in.

17 **DR. MELIUS:** Seems to me that if this is going to be a
18 recurrent problem that some communication -- I mean the
19 claimants deserve some communication. If they haven't
20 heard from you in, you know, 90 days or 60 days or
21 whatever on a -- you know, what's happening with their
22 claim, I think they deserve some communication, you

1 know, from you about what's going on -- the problem is
2 getting dose information or you've requested more,
3 whatever that -- that's going on or that's delayed
4 getting the program started and whatever. But it seems
5 to me that that would be the least you could do, rather
6 than let -- you know, have them sit there trying to
7 figure out what's going on.

8 **DR. ZIEMER:** And Larry's got a response also here.

9 **MR. ELLIOTT:** Yes, Dr. Melius, we certainly agree with
10 you and we think the claimants do deserve recurrent
11 contact from us on a regular basis. We are -- as Dave
12 said, we're considering how best to do that. We're
13 targeting the groups that we need to reach out to,
14 those that were the early claims. We're working up the
15 communication vehicle that we're going to use for each
16 of those targeted groups.

17 I would offer this, though, that the majority of those
18 callers that we get are really a minority of the whole
19 claimant population. We hear frequently from
20 claimants, and in that minority there is a relatively
21 few that contact us. But we're not losing sight of
22 what you're suggesting, that even though we're not

1 hearing from the majority of the claimant population,
2 we need to maintain our contact and our dialogue with
3 them, and we are working toward that end.

4 **DR. MELIUS:** It's just precisely that that worries me.

5 It's this -- the people you don't hear from are the
6 ones that I think also deserve some communication from
7 you. I have some other questions, but why don't you
8 let somebody else go on and I'll --

9 **DR. ZIEMER:** Let's get -- I think we had Roy and then
10 Robert and then Tony.

11 **DR. DEHART:** Roy DeHart. My question addresses this
12 estimate of 6,000 dose reconstructions completed by, I
13 assume, the end of the calendar year, '03. Is that
14 realistic? We're talking about only seven months
15 remaining, essentially, to accomplish that task.

16 **MR. SUNDIN:** Yes, I think it is realistic. There's
17 been a lot of groundwork put in place that will, we
18 believe, permit us to achieve those kinds of goals, and
19 those goals were developed in discussions and full
20 consultation with our contractor, ORAU. So it'll be a
21 big rise. It'll be a challenge, but much of what we've
22 been doing now is put the machinery in place to change

1 that level of production.

2 **MR. PRESLEY:** Dave, Bob Presley. Could you elaborate a
3 little bit on some of the problems you're having in Oak
4 Ridge with the records?

5 **MR. SUNDIN:** Well, it's one of the better sites, Bob.
6 I think they've done a good job of responding to this
7 high volume of requests that we've gotten. In terms of
8 having a general sense of the quality and completeness
9 issues, if any, I don't have that because I'm not
10 really in the stream of reviewing them. There aren't a
11 huge number of severely late cases out of Oak Ridge, so
12 I -- I would have to say that on the whole -- you know,
13 unless others want to correct me -- I would say that
14 they're not problem-free. There've certainly been
15 cases where we've had to, you know, give them a notice
16 that this is overdue, but I would say that they've been
17 very responsive.

18 **MR. PRESLEY:** Thank you.

19 **DR. ANDRADE:** Tony Andrade from Los Alamos. I agree
20 with Dr. Melius that there should be some kind of
21 communication. However, if the communication simply
22 states that the dose reconstruction effort is awaiting

1 dose records and leaves it at such, you potentially are
2 in a situation in which you are slamming a site. In
3 our -- at our laboratories, for example, one employee
4 may have had film dosimetry, a two-chip thermoluminescent -
5 - thermoluminescent dosimeter, and now we're using the
6 six-chip TLD. On top of that, there could have been
7 neutron dosimetry, track-etch* dosimetry and then
8 dosimetry for various types of isotopes. So when you
9 ask for the records for one employee, it is not a
10 trivial process in many instances to recover the data
11 and then deconvolute the data from committed effective
12 dose equivalent back down to annual dose. So I know
13 that, on a per-person basis, it is a -- somewhat of a
14 task to send back precisely what NIOSH is looking for.

15 So all I -- all I say is that that communication, if
16 it's too simplified, can give the wrong impression.

17 **DR. ZIEMER:** Jim, you had another question?

18 **DR. MELIUS:** I have some more, but I think Mark was
19 ahead of me.

20 **DR. ZIEMER:** Oh, I'm sorry, I didn't see Mark, but we
21 have a response from Jim Neton.

22 **DR. NETON:** This is Jim Neton from NIOSH. I'd just

1 like to comment that we are ramping up -- ORAU's
2 ramping up with the dose reconst-- I mean the computer-
3 assisted telephone interviews, as you saw, so we've
4 completed almost 3,000 interviews at this point, so
5 claimants are being directly contacted by us. They are
6 contacted in writing prior to the interview, and they
7 receive a follow-up summary of their interview after
8 that. The rate at which ORAU can accomplish interviews
9 is now around 1,000 a month, so I think you'll see that
10 many of those early claimants will be contacted in the
11 near future directly by NIOSH.

12 **DR. ZIEMER:** Thank you. Okay, now Mark.

13 **MR. GRIFFON:** Yeah, just a follow-up on some of -- on
14 the 6,000 cases question and -- you mentioned that a
15 lot of the groundwork has been laid for -- you know, to
16 make this -- to make that possible. I'm wondering
17 about the site profiles, if -- and you might not be
18 able to give us a status report, but I'm curious if we
19 can get some status on the -- maybe before the end of
20 this meeting, a status report on where the site
21 profiles stand across the board. I think the last time
22 we saw them, they were -- well, very -- very differing,

1 depending on the site. Some had a lot of information,
2 some had very little, so I'm just curious where that
3 stands.

4 **MR. SUNDIN:** I didn't bring that into this
5 presentation, Mark. There probably are -- well, Jim
6 can give you more details. I know that some of them --
7 several of them are being worked on.

8 **DR. NETON:** I can comment in general, and we're not
9 prepared really to discuss the exact sequence of the
10 site profiles at this meeting, but we are moving
11 forward with the exposure models, as you noticed last -
12 - two meetings ago, I believe, where we discussed the
13 Bethlehem Steel model. There are two flavors of site
14 profiles or Technical Basis documents, as we call them.

15 One is an exposure model, which is what was done with
16 Bethlehem Steel, where there were no bioassay data, no
17 individual monitoring data, so ORAU was -- relied on
18 the air sample data that was available and generated
19 distributions about some central tendency of exposure
20 for that model.

21 The other type of site profile would be the actual data
22 where we have bioassay monitoring records and those

1 sort of pieces of information, and we are fleshing out
2 the detection limits and monitoring frequencies and
3 those sorts of things.

4 We have in house a completed site profile -- a draft
5 site profile for Savannah River site. That's being
6 reviewed by our staff now and we hope to have that
7 finalized within the next month or so. There are a
8 number of other site profiles that are being developed
9 in parallel. We're not -- this is not a linear effort,
10 so there is an entire group devoted to doing nothing
11 but Atomic Weapons Employer site profiles, and there
12 are other groups assigned to the various -- to the
13 larger sites where we can cover I think 90 percent of
14 the claims with something like 20 or 21 site profile
15 documents. And so that's -- that's the plan right now.

16 But the only completed draft in-house we have is
17 Savannah River, and actually there is a Bloxon Chemical
18 Atomic Weapons Employer model we're also reviewing at
19 this time.

20 **DR. ZIEMER:** Thank you. Mark, follow-up on that?

21 **MR. GRIFFON:** Yeah. I guess the -- the main reason I
22 reflect on this is that, you know, one of the concerns

1 that we've heard for years is -- is the concern with
2 dosimetry data. And coming into this Board, I think
3 we've -- we've discussed this issue, and my fear is
4 that, 6,000 cases pending, that there's going to be --
5 I guess certainly it seems that you're going to turn to
6 dosimetry data first, but in order to test the adequacy
7 of those dosimetric records for purposes of this
8 program, I think there has to be some site profile
9 information, some site data to -- to make sure that --
10 that you're not just using already-suspect data to --
11 to make a conclusion on a compensation claim. So I
12 think that was one of the central themes coming into
13 this program. There was a lot of concern about
14 dosimetric records and I think, you know, we -- there
15 should be a lot of attention paid to that.

16 **DR. NETON:** Yeah, I would comment that we don't take
17 any dosimetry information at face value when it comes
18 in. I mean we -- we do investigate it and make sure
19 the individual monitoring results were of sufficient
20 technical quality to be able to reflect the conditions
21 in the work place. Although I do agree there are some
22 scenarios that are more complicated than others, but I

1 think that if we can validate the bioassay monitoring
2 record, monitoring record -- monitoring program, and
3 the film badge or TLD monitoring program, I think we
4 can go ahead and work with that at face value if it
5 appears to be a valid measurement.

6 **DR. ZIEMER:** And Jim, you have another question?

7 **DR. MELIUS:** Yeah, back to the -- a couple of
8 questions, actually, but first of all, back to the
9 progress on the program. It's very hard for us -- at
10 least for me sitting here to get a handle on the hang-
11 up. Why's it taking so long to get the program going,
12 and it's I think equally hard for the claimants, as
13 well as, you know, the number of members of Congress
14 that have expressed some concern recently about the --
15 how slow the process has been. And we keep hearing
16 that you're going to gear up and so forth. I just
17 quite don't understand what the hang-up is over the
18 last -- you know, what's holding up progress for the
19 last few months in this program. You've staffed up
20 with your contractor, yet it seems that we have, at
21 most, 200 or 300 claims that are sort of close to being
22 completed in the process that are out for review that

1 you're reviewing. And I can't tell -- is the issue the
2 contractor, is the issue the -- your staff? You know,
3 are you adequately staffed yet in order to be able to
4 handle all these claims? And I guess -- you know, I
5 hear number of going for around 6,000 by the end of the
6 year, I really find that hard to fathom, given what's
7 gone on so far with the program, particularly to
8 maintain some quality and so forth to it. So am I not
9 understanding something about the process or --

10 **MR. SUNDIN:** Well, I just -- I think -- it depends on
11 what you focus on to measure progress. Certainly, as I
12 said, we're all happy to see the end product start to
13 come out the pipeline, but I would say that we've --
14 being on the inside of the program, working shoulder-
15 to-shoulder as I do day to day with some very highly
16 motivated people, that they're doing the very best they
17 can on behalf of all claimants. I would say that
18 there's been a substantial amount of progress made to
19 basically lay the groundwork and develop the processes
20 which lead to what I think many people focus on as the
21 sole progress indicator, which is completed dose
22 reconstructions. So I don't -- I don't -- you know,

1 this is a program which came into being and had to be -
2 - a whole organization created, so I -- I think we've
3 made very good progress in getting to where we are now.

4 **DR. MELIUS:** Then can you just tell me in more detail
5 what your -- what has been the progress? Is the -- is
6 all this time spent getting set up, as you say, or
7 whatever -- are you adequately staffed to be able to
8 handle the number of claims coming over to you, review
9 them? 'Cause I think that's -- you know, we -- you've
10 described what the contractor's doing, that's -- may be
11 fine and so forth. But how about at the NIOSH --
12 staffing, 'cause that's also another potential
13 bottleneck and you really didn't provide much detail on
14 where you stand with that.

15 **MR. SUNDIN:** Well, I indicated we're at about 35 people
16 right now and recruiting for a few more vacancies. I
17 think we've designed the organization to basically
18 provide enough health physics capability to review each
19 and every completed dose reconstruction, a sufficient
20 number of public health advisors to be able to interact
21 with claimants and to handle the case referrals when
22 they come from DOL and then submit them back, and

1 certainly we've got some IT professionals that are
2 working with us to develop the very most efficient
3 database system that we can. So I would have to say
4 that we've -- we've sized our staff and our
5 organizational plan to -- appropriately to meet what we
6 think the -- what the requirements are going to be at
7 the kind of production level that we're anticipating.

8 **DR. MELIUS:** Do you have a system that tracks each
9 claim and can tell you statistically where you -- where
10 it is in the process and where things are getting
11 slowed down, if they're getting slowed down? I mean
12 we're getting bits and pieces of a tracking system
13 here, you're -- you know, when it goes out for dose
14 records.

15 **MR. SUNDIN:** Yes, we do. We've got a really pretty
16 good system, which is evolving as we identify new needs
17 for it. But yes, we can track each claim through all
18 of the significant steps that a claim goes through on
19 its way to completion. And that system, of course, can
20 drive management reports, as needed, and all the other
21 kinds of uses that one makes of that kind of data. So
22 yeah, we have a fairly detailed system of tracking each

1 claim.

2 **DR. MELIUS:** And if I'd be correct, then four months
3 ago that would have shown that the hold-up was at the
4 interview end, getting people out to interview and --
5 and getting claimants interviewed. Now it would appear
6 to be getting from the interview into a final dose
7 reconstruction and review. Is that...

8 **MR. SUNDIN:** Well, I mean that is the way the pig moves
9 through the python. At the outset there were a lot of
10 claims that weren't even automated, that then a DOE
11 request had not been made. So as each claim is with us
12 longer, then it progresses more toward the end of the
13 process. We do have significantly more interviewers
14 doing interviews right now, so that -- that trend as
15 you see is going up fairly sharply. There will be a
16 lag between that and the dose reconstructions as these
17 claims then find their way to a dose reconstruction.
18 So I don't know that there's any single hang-up. I
19 think we've got things sort of balanced. It's just
20 that the life cycle of a claim will lead to more things
21 being done on claims that are supposed to be done early
22 on a claim than later.

1 **DR. ZIEMER:** All right. Henry, you have a question?

2 **DR. ANDERSON:** Yes, I just wanted to get a bit of
3 information on the -- on what you're going -- or what
4 your strategy is for those that are now getting out to
5 the 150-day plus as far as information on those. It
6 would seem to me some of those may well be ones that'll
7 end up with incomplete records and would be a special
8 cohort person and -- and my question really is at what
9 point do you decide that, you know, you now need to go
10 into a secondary strategy as to how -- you know, are we
11 ever going to find records on these people. So part of
12 it is, do you know how many of those are simply that
13 the specific sites haven't gotten to the record so you
14 don't really have any information on it, or have they
15 started, gotten records and said boy, there really
16 ought to be records on XYZ, but we can't find them yet
17 and so they're continuing to hunt, in which those are
18 going to be the more problematic than it's simply a
19 massive backlog and they don't have the staff to begin
20 the process, so those are sitting there basically cold,
21 waiting to get started, versus those they've processed
22 to a certain degree and they have some records but

1 there should be more and they haven't located them yet
2 and at some point you're going to have to close the
3 system off and say now then these are -- those go into
4 a Plan B as to how we're going to deal with them.

5 **MR. SUNDIN:** Sure. No, good point. We obviously don't
6 want endless searches to go on when there's no prospect
7 of finding something. So far I don't believe we've had
8 many responses from DOE that said I have exhausted --
9 we have exhausted all of our search strategies and have
10 found nothing, end of story. But that's clearly what
11 we need to call for at a certain point. Many of these
12 sites that we believe are on productive searches or
13 indexing strategies that will actually yield
14 information, but clearly at some point we need DOE to
15 tell us that they've reached the end of that line, and
16 we've not gone back with that sort of call yet to any
17 sites.

18 **DR. ZIEMER:** I'd like to ask the staff if it might be
19 doable at our next meeting to give us a little more
20 detail on the site profile issue, perhaps a more formal
21 update on that. Is that something we could schedule
22 for the next meeting?

1 Do we have additional questions for Dave at this point?

2 **DR. MELIUS:** I have one --

3 **DR. ZIEMER:** Jim, yes.

4 **DR. MELIUS:** -- or two separate issues. One is on --
5 and I may not be recalling this correctly 'cause I --
6 you don't have in in the table -- the DOE Memorandum of
7 Understanding went out. I recall when I read that it
8 surprised me a little bit, there was a -- something in
9 there to the effect that each completed dose
10 reconstruction would -- applied in individually-
11 identified form, would go to DOE also?

12 **MR. SUNDIN:** Yes.

13 **DR. MELIUS:** What's the basis for that?

14 **MR. SUNDIN:** It's statute.

15 **DR. MELIUS:** Okay. Secondly, at one of our recent
16 meetings we talked about conflict of interest
17 statements being up on the web site for Oak Ridge AU
18 staff, and when I looked at the web site recently it
19 looked like at least half of them were missing. Is
20 that an --

21 **DR. ZIEMER:** Who can --

22 **DR. MELIUS:** -- issue or something?

1 **DR. ZIEMER:** -- respond to that?

2 **MR. SUNDIN:** You're looking at the ORAU web site?

3 **DR. MELIUS:** Yeah.

4 **DR. ZIEMER:** ORAU's web site? Dick Toohey, can you
5 respond? Or Jim?

6 **DR. TOOHEY:** Dick Toohey, ORAU. We're hanging them up
7 right now. What happened -- and I'll freely admit, I
8 dropped the ball on that one. A couple of meetings ago
9 we had a request to change that form to include atomic
10 weapon employer development, so we sent new forms out
11 to all the people. We have gotten them back in and
12 they are -- I think they're all scanned now and being
13 hung up there on the web site, so they should all be
14 out there for the people directly involved in dose
15 reconstruction. You know, we're not putting them up
16 for computer programmers and folks not directly
17 involved in the dose reconstructions themselves.

18 **DR. ZIEMER:** Understood.

19 **DR. MELIUS:** And then finally one request for our next
20 meeting. Could we get a more detailed way of
21 presenting the progress in terms of these claims, where
22 things are in the process, number of claims at each

1 stage and so forth and what progress is being made,
2 'cause I just find it very hard to -- give us snapshots
3 and it's very hard to see where -- how things are
4 moving through the process or where there are potential
5 problems. Understand -- I mean I'm not asking for a
6 response.

7 **DR. ZIEMER:** Yeah. They would need to identify how to
8 do that in terms -- you're asking for how many are at
9 this stage -- we're seeing some of the stages. You're
10 asking for the intermediate points, I think.

11 **DR. MELIUS:** And there may be different ways of
12 presenting it. I don't -- 'cause things are changing
13 and apparently rapidly, so I -- but...

14 **DR. ZIEMER:** Perhaps in terms of the framework of the
15 questions that have been asked, you get the sense of
16 what's being asked for.

17 **MR. SUNDIN:** Yeah. No, I do. I made a note of it,
18 Jim, and if you -- certainly if you have any preferred
19 formats, let us know.

20 **DR. ZIEMER:** We do need to move on here. We have a
21 very full agenda for this meeting. Let me move us
22 forward. We have a related report on the DOL,

1 Department of Labor's status on their part of the
2 program. We're going to hear from Shelly Hallmark --
3 Shelby Hallmark. Shelby has been with us before, but
4 let me just remind you all who Shelby is. He was named
5 Director of the Office of Worker's Compensation
6 Programs for Department of Labor in June of 2001. He
7 had been Deputy Director of that office beginning back
8 at about 1990, and also served a couple of times as
9 acting director, but now is the Director of that
10 office.

11 He's been with the Department of Labor since 1980. He
12 had a whole series of assignments over the years,
13 starting -- or including responsible positions in
14 Employment Standards Administration's Office of
15 Management, Administration and Planning. He's also
16 served as Chair of the Secretary of Labor's Strategic
17 and Performance Planning Work Group in '98. He led the
18 Department of Labor's 1999 to -- well, really current,
19 I guess, to 2004 Strategic Plan, and its year 2000
20 Annual Performance Plan. So Shelby, we're pleased to
21 have you with us this morning to give us an update on
22 the Department of Labor's part of this program.

1 players. We're pleased to say that we have a great
2 relationship I think with all of the groups that are
3 listed, and in particular with NIOSH. They've worked
4 extraordinarily closely with us and we're pleased with
5 that.

6 Energy has come along, and in answer to your question,
7 Mr. Presley, about Oak Ridge earlier, we're pleased
8 that we've been getting faster responses on our
9 requests for records as we go to the sites, and
10 especially at Oak Ridge where we have obviously a big
11 volume. So the whole system is now at a point where
12 it's working much more effectively.

13 We've gotten about 42,000 claims, and you'll see data
14 in this -- in these charts that are both listed as
15 claims and as cases. Obviously there are -- each
16 individual person can file a claim, and so if you have
17 a survivor claim, there could be five claims, all
18 associated with one worker, which would be what we call
19 a case.

20 We've paid out about half a billion dollars now, a
21 little over the \$562 million or thereabouts.

22 We have about 300 Federal and contractor workers

1 involved in our program in sites around the country,
2 most of them in our district offices and our national
3 office, between our legal folks -- they count as
4 people, too, you know -- just barely. And our final
5 adjudication branch, which is spread all over the
6 country, also.

7 As I say, we've got about 42,000 -- almost 43,000
8 claims now. We have received about 8,000 claims so far
9 this fiscal year, since October. We expect to get
10 about 12,000 to 18,000 by the end of September, which
11 is a big spread. And this slide indicates my
12 expectation that as NIOSH cases come out of the
13 pipeline, we will see an upsurge in cases. We don't
14 know that for sure. We've had some indications, but
15 it's possible that we'll have another upward blip.
16 This is a quick refresher on the types of claims we've
17 had, and you probably can't read these tiny little
18 print in the back, but the yellow is cancer. That
19 would be both SEC and NIOSH dose reconstruction cases,
20 about 28,000, 29,000. Beryllium is about 2,000.
21 That's sensitivity. About 1,800 CBD claims, about 800
22 silicosis claims, under 5,000 RECA claims and a very

1 large number of other, which are basically -- this
2 19,000 or so are basically folks who filed Part B
3 claims who really are entitled to Part D claims, and
4 that's taking the wrong door, basically.

5 There's our break of claims by employees, living
6 workers and survivors, and as you see there, it's
7 mostly survivors, 57 percent.

8 This is status of our cases right now, and this is a
9 slide I think I showed back in Santa Fe, which -- and
10 I'm proud of the changes that we've made here. In
11 Santa Fe you'll remember we had about 20-some-odd --
12 27,000 cases over here on the right, total cases, but
13 we had about 8,000, 9,000 cases in the pending status,
14 which meant our district offices were still doing
15 something about them. Now that's 3,000, so that's less
16 than ten percent, and we're looking at basically new
17 cases that have come in in the last few months that are
18 in that pending action category. Then they move across
19 to the final -- they actually -- they go to a
20 recommended decision, then they either go to a final
21 decision or to the far column over there, which is sent
22 to NIOSH. Those are the two possible outcomes that

1 we're looking at pending a NIOSH decision. So you can
2 see we're in -- we're fairly current at the present
3 time in our process.

4 This is just a slide that gives you a basic -- a little
5 breakout of the types of cases that are in that 19,000
6 that I pointed out earlier which are not covered under
7 our Part B program. A lot of lung cases, some just
8 other other, which -- a compilation -- heart cases,
9 asbestosis, COPD, renal failure -- even hearing loss,
10 which in that case I think hearing loss doesn't even
11 apply in most cases to the Part D situation.

12 This is just some basic program data, where we are in
13 various different categories. Obviously we keep a lot
14 of data and can give the Board more if you'd like to
15 see it. This is a figure that I have pointed to in the
16 last time I spoke with you, which is that we still are
17 not paying very many medical benefits. That's about
18 \$10 million out of a total of \$562 million in benefits,
19 and that's -- suggests that we probably should be
20 paying more, that people are not bringing the claims to
21 us for medicals.

22 This gives you another breakout of the outcomes of our

1 final decisions. As you see there, 11,000 denials, the
2 -- I believe that's purple bar is the other. That's
3 the not covered conditions. Again, that's that group
4 of cases that really should have gone through the other
5 door to Part D. And so that's really skewing our
6 outcomes. These are the sort of traditional worker
7 compensation issues -- is the person really an employee
8 of one of the covered places, is it a survivor who is
9 eligible under our program, can they link the condition
10 to the employment, is there sufficient medical. Those
11 are the kind of traditional Workers' Comp denial
12 categories beyond the ones which come in as basically
13 the wrong door.

14 So this is our outcome level right now. I think when I
15 showed you this slide in Santa Fe it was the other way
16 around. It was 60 percent approvals, 40 percent
17 denials. Now it's 70 percent denials, 43 percent
18 approval. If you take out the Part D cases that came
19 to us that are not applicable, that approval rate goes
20 up to 70 percent.

21 And this tells you something about the timeliness of
22 our processing. We have established goals for two

1 different categories of cases. One is our -- the basic
2 DOE contractor site and RECA, which is 120 days down
3 here (indicating). And the other -- and the up above
4 is the AWE, beryllium vendors and subcontractors, which
5 is up at the top. And our goals were 120 days for the
6 straight -- what we thought would be straightforward
7 cases and 180 days for the more complicated cases where
8 we have to go searching for employment records. And as
9 you see there now we're meeting those goals on average,
10 178 days for the AWE beryllium and 113 days plus for
11 our DOE/RECA cases. And I -- that's been a -- hard-
12 fought to get to that point, and we are getting better
13 every day.

14 Of the cases we've gotten back from NIOSH -- and our
15 numbers are a little bit different. I don't know,
16 there may be some cases in the mail, Larry, I'm not
17 sure. Our folks, as of last week, told me we had 48
18 cases back from you. If there's another 25 out there,
19 we're glad to get them, too. There's 135, by the way,
20 in full disclosure, which we've gotten back because we
21 sent it to NIOSH and it didn't require a dose
22 reconstruction, either the -- there are some cases,

1 like CLL, which early on we decided were in a different
2 category, did not receive a dose reconstruction. And
3 other cases where the individual, for example, may have
4 later been determined to be part of an SEC and so there
5 was not a dose reconstruction required, or the claimant
6 died or other kinds of circumstances. So there's some
7 that have come back to us for those reasons. And then
8 -- but of the 48 that we've gotten back, we've accepted
9 80 percent at the first recommended decision level.
10 We've accepted 13 out of 14 at the final level -- it
11 takes a little while to get from one step to the other
12 -- but we're anxious to get the rest of them.
13 As you've heard this morning, we expect to get 6,000
14 dose reconstructions through the end of this calendar
15 year, and we are gearing up to accept them. We have a
16 target of completing the first stage, the recommended
17 decision, in three weeks of the receipt of the case
18 from NIOSH, and I think we can meet that. And then the
19 time from the time you get a recommended decision to
20 when a final decision is issued can vary, depending on
21 what the outcome is and how long the claimant takes to
22 consider his or her options, but that won't be any

1 different than it is now. And we will -- as my last
2 bullet says, we will move our cases around as we need
3 to, because we expect to get clumps of cases. Our
4 cases are geographically split among our four offices
5 in Seattle, Denver, Cleveland and Jacksonville. We
6 expect that because of the site profile approach, NIOSH
7 is going to send us largely clumps of completed dose
8 reconstructions which may overwhelm an individual
9 office and that'll require us to distribute the
10 workload to make sure that we meet these goals we have
11 to move these cases through very promptly.

12 Just a few statistics about our cases that come in from
13 Tennessee, about 5,600 cases so far. You see there we
14 referred 2,300 to NIOSH, recommended decisions on
15 3,000. We've paid 1,500 claimants here in Tennessee
16 about \$167 million.

17 And this just shows you briefly what the status of
18 those cases are. This is similar to the earlier slide.

19 Of the 5,600 cases only 445 are pending, and that
20 means you're current with workload coming in the door.

21 The cases in Tennessee are mainly cancer, but a fairly
22 good number of beryllium sensitivity and chronic

1 beryllium disease, 51 silicosis cases there and 2,000
2 other, which are the -- you know, Part D cases,
3 basically. The silicosis cases could be in effect Part
4 D, people who have filed the wrong thing, because only
5 miners at the Nevada Test Site and Amchitka are
6 eligible for benefits for silicosis per se under this
7 program, although these people could have been there
8 and moved to Tennessee, so that's a possibility, also.
9 And I just show this slide, this is -- this shows a
10 little bit about our expectations of claims receipts,
11 and these data on the left as far as worker population
12 came to us from DOE long ago. I think David Michaels
13 gave us these. And I don't know that they are
14 absolutely correct. They certainly don't include the
15 whole penumbra of subcontractor and in some cases
16 construction workers, and so that number may be low in
17 that respect. But you see the number of claims we've
18 received in the three different Oak Ridge sites and the
19 percent of the population that has claimed. And these
20 percentages are a little higher than they are in some
21 areas, some other sites, but much lower, for example --
22 and interesting that K-25 is seven percent. Paducah's

1 similar plant is 36 percent of the known population has
2 filed, and Portsmouth is 14 percent. So that's
3 interesting in terms of the possibility that there may
4 be other claims out there in the Oak Ridge area which
5 are -- which could come in and which are possibly
6 eligible cases. Again, given the vagaries of the
7 estimation of the population, that's not a high
8 science.

9 Just this last slide to say that we are continuing to
10 do outreach, and the previous slide suggests that. We
11 are -- we expect that there are other people out there
12 who could file, and I don't expect you to be able to
13 read that fine print back there. Don't strain
14 yourself. But we're trying to do a lot of things. We
15 still have our resource centers that are delivering
16 help at the sites, including here in Oak Ridge. We
17 have traveling resource centers. We're trying to get
18 them out to as many locations as we can where we don't
19 have a permanent office to try to address needs of
20 people who haven't come forward. We're working with
21 unions and other groups who have lists or information
22 about people that we might contact directly. We're

1 trying to do things with media, public service
2 announcements, that sort of thing to get words out to
3 people who are not even close or no longer affiliated
4 with any of the communities or unions or other
5 activities. And we have our web sites, et cetera, et
6 cetera. So we're looking for ways to try to improve
7 our outreach so that we make sure that everyone who is
8 in fact eligible for this program comes forward. We
9 don't want people to come forward and file claims who
10 are not eligible, but if they are, they have a
11 possibility, we want them to know about it and we're
12 looking for as much help from as many different sources
13 as we can -- as we can find.

14 And that's, in a nutshell, where we are with the
15 Department of Labor so far. Can I answer questions?

16 **DR. ZIEMER:** Yes, thank you very much, Shelby. Who has
17 a question? Okay, Roy first.

18 **DR. DEHART:** Roy DeHart. Would you better define Part
19 D and specifically does it include mechanical injuries,
20 such as backs, necks, that sort of thing?

21 **MR. HALLMARK:** Part D of course is the part of EEOICPA
22 that is administered by the Department of Energy and

1 Tom Rollo*'s group. As I understand it, Part D covers
2 occupational illnesses caused by exposure to toxic
3 agents, and I believe their regulation defines toxicity
4 as not including such things as hearing loss and other
5 sort of mechanically-conceived injuries. I think they
6 did include toxicity -- they did include radiation as a
7 toxic substance, although that I guess is -- there's
8 some debate -- definitional debate about that, but that
9 is included as part of the array of cases that you can
10 take to the Part D portal. And everyone should
11 understand that Part D -- individuals who are eligible
12 for Part B are also eligible to apply separately to DOE
13 under Part D, so you can go both ways.

14 The other column that I was citing to are people who
15 are not eligible for Part B at all. They may be
16 eligible for Part D, and you should know that as we
17 receive cases and claims from those individuals, we
18 inform them on a regular basis -- oh, you filed a claim
19 for asbestosis; we don't cover asbestosis, these people
20 over here do. And we give that information to them.

21 **DR. ZIEMER:** Jim and then Rich.

22 **MR. ESPINOSA:** He answered it.

1 **DR. ZIEMER:** Oh, he answered your question. Okay, Jim
2 then.

3 **DR. MELIUS:** Okay. I hope Dave or Larry will find the
4 missing 25 cases and let us know.

5 **MR. HALLMARK:** We hope they're -- they're coming soon.

6 **DR. MELIUS:** They're in the mail, right?

7 **MR. ELLIOTT:** Well, let me answer that right now
8 because I signed 12 finished ones last Friday, so there
9 is a lag time between us and getting them to DOL, so
10 they're not only in the mail, they're there.

11 **DR. MELIUS:** We just want you to know we're keeping --
12 keeping an eye on you.

13 What is the -- you may not -- I don't know if you know
14 this or not, but with the SEC claims, what's the trend
15 been with them? Have they seemed to be going up, going
16 down in terms of numbers filed and...

17 **MR. HALLMARK:** I can't say for sure because our -- the
18 data that I see on a weekly basis is split out by site,
19 but they don't -- there -- there could be claims in
20 Paducah or Portsmouth that are either dose
21 reconstruction cases because they have a cancer that's
22 not one of the -- one of the 22 that's listed in the

1 statute, or they could be beryllium or they could be,
2 you know, other things. So I'm not sure. I will say,
3 though, that Paducah's volume of claims that have been
4 coming in has stayed high. In part I think that's --
5 just reflects the fact that our resource center and the
6 assistance that we get from PACE and other folks in
7 Paducah is really intense there and so we find, for
8 example, there's more -- there's more focus and more
9 outreach to subcontractors I think in the Paducah site
10 than some of the others. It's hard to say. I mean the
11 percentage I showed there for Oak Ridge is six to seven
12 percent. I think in Hanford it's four percent. So
13 there are some sites where it's very, very low, and
14 that's four percent against a number of employees in
15 Hanford that doesn't even count any construction
16 workers, and I've heard estimates of as high as 100,000
17 construction workers out there. So Hanford is very
18 low. It's hard for us to know what the -- you know,
19 what all the socioeconomic and other kinds of factors
20 are, but we're trying to swim against that and see if
21 we can't get people to come forward who in fact are
22 eligible.

1 **DR. MELIUS:** Well, certainly at the SEC sites people
2 are getting compensated so --

3 **MR. HALLMARK:** There shouldn't be any --

4 **DR. MELIUS:** Whereas the other claims that are not yet
5 are at a very, very low rate, so --

6 **MR. HALLMARK:** That's right.

7 **DR. MELIUS:** -- that certainly gets -- word gets out
8 and --

9 **MR. HALLMARK:** But as I say, it's clear that -- if
10 these data are anywhere near accurate, it's clear there
11 are a lot of K-25 employees who either haven't filed at
12 all or, you know, maybe they -- you know, maybe because
13 the population was older here, you know, they've
14 dispersed and they just haven't gotten the word.

15 **DR. MELIUS:** Right, yeah. No, no, I think -- and I
16 agree that there's a lot more outreach that can be done
17 for these. One of the concerns of the Board has been
18 people that might have -- be sort of partially eligible
19 for an SEC. They worked, you know, some number of days
20 there, but not enough to be eligible at a particular
21 site, but then would have time at another part of a DOE
22 complex, either another part of the site that's not SEC

1 eligible or at another site that's not an SEC site.
2 And there's really -- it raises some difficulty in
3 terms of how do you do dose reconstruction and so
4 forth. Is there any way within your system of keeping
5 track of that -- or maybe NIOSH can, I -- you know,
6 those claims I assume would come in for an SEC --
7 initially identified possibly as an SEC. Then if it's
8 discovered that they don't meet the employment
9 requirement, do they -- do they get tagged in some way
10 when they go over to NIOSH 'cause --

11 **MR. HALLMARK:** I -- I don't know. Pete Turcic, who is
12 the director of the Energy program, is sitting back
13 there, may be able to answer this better. It's my -- I
14 don't know how many would fall into that category, but
15 clearly at the point that we made the judgment that
16 there were less than 250 work days that would qualify
17 the individual as an SEC recipient or claim, we would
18 then start to process it as a NIOSH referral. And
19 whether that -- you know, whether we have any kind of
20 tag on it that says this was a partial SEC or not, I
21 don't know. Pete?

22 **MR. TURCIC:** Yes, we can track those claims, and we do

1 send them to NIOSH for a dose reconstruction. I
2 believe we have some 400 or so claims, like from
3 Paducah, for example, that are in for dose
4 reconstructions.

5 **DR. MELIUS:** Okay. 'Cause I mean one of the -- on
6 Larry's long list of things to do, I mean, one of the
7 issues is that there is some regulation-related things
8 that have to be dealt with that haven't been addressed
9 yet with those, and I was just trying to get a sense
10 of, you know, is it a priority or -- you know, are
11 there many of these? I expect there'll be a fair
12 number of them, just given the nature of employment at
13 these sites and so forth.

14 **MR. ELLIOTT:** I don't have the numbers at my disposal
15 right now, but we need to make sure we're clear on
16 this. There are two types of claims here. There is
17 those that are SEC but non-presumptive cancer claims
18 which are sent over to us to do dose reconstruction.

19 **DR. MELIUS:** Right.

20 **MR. ELLIOTT:** And in that category, they may only have
21 that site. Then there's this other category where they
22 worked at an SEC site but not for the full time period

1 required, and they may have worked at other sites.
2 That's the category you're getting at with your comment
3 about dose reconstruction and our regulation. Yes, we
4 can track both of those. We do track both of those.
5 We can identify them in our tracking system as to which
6 claim fits into which category.

7 **MR. HALLMARK:** And I would assume that of the 400 that
8 Pete just suggested from Paducah that the vast majority
9 of those are in the other kinds of cancer category as
10 opposed to less than 250 work days. Now again,
11 Paducah's done a better job of finding subcontractors
12 and so they are more likely to have ferreted out people
13 who were on-site for a small period of time or maybe
14 intermittently over a long period.

15 **DR. ZIEMER:** Mark Griffon has a question.

16 **MR. GRIFFON:** Just a follow-up on some data, and I
17 don't know if you keep this kind of data, but curious
18 if you had any statistics on the types of cancers and -
19 - overall and then broken out by site.

20 **MR. HALLMARK:** Cancers, as in primary?

21 **MR. GRIFFON:** Yeah, number of claims, type of primary
22 cancer.

1 **MR. HALLMARK:** Yeah, we have --

2 **MR. GRIFFON:** Do you track --

3 **MR. HALLMARK:** I don't have it with me, obviously.

4 **MR. GRIFFON:** I mean is that something that can be
5 provided to the Board possibly?

6 **MR. HALLMARK:** Yes, absolutely.

7 **MR. GRIFFON:** And the second is, do you -- do you track
8 job categories or job -- job titles is interesting.
9 Job categories would be more interesting to me.

10 **MR. HALLMARK:** That's not an element of our data
11 system, and it's one that's very difficult to get your
12 arms around, but we do -- you know, obviously we do
13 have the cancer data.

14 **DR. ZIEMER:** Other questions for Shelby? There appear
15 to be none. Thank you very much.

16 **MR. HALLMARK:** Thank you.

17 **RECENT IREP MODIFICATIONS AND RECOMMENDED UPDATES**

18 **DR. ZIEMER:** Now we're going to move to an update on
19 IREP and some recent modifications and updates. We
20 have two individuals with us today from SENES. One is
21 Brian Thomas. Brian basically is a nuclear engineer.
22 He's got his undergraduate and graduate degrees from

1 the University of Tennessee. He specialized in health
2 physics, risk assessment, uncertainty analysis. He's
3 had over ten years of experience in qualitative
4 uncertainty analysis, extensive experience in
5 developing and programming complex computer models,
6 including the IREP model -- or the NIOSH-IREP model.
7 And also let me introduce the other individual, who is
8 Iulian Apostoaei -- is that close enough? And --

9 **MR. THOMAS:** I think Apostoaei would be the --

10 **DR. ZIEMER:** Right. We don't know whether we're using
11 an American pronunciation or Greek or whatever, but Dr.
12 Apostoaei is very experienced in radiological
13 assessment, and actually did his doctoral work
14 involving the uncertainties of internal dose factors
15 from ingestion of Strontium-90. He's used the most
16 recent ICRP models and is currently developing
17 computational tools for determining acute and chronic
18 intakes from plutonium -- or for bioassay data from
19 plutonium intakes, estimating doses. This was a
20 project I think originally came out of the University
21 of Colorado and supported the epidemiological studies
22 of the Rocky Flats workers.

1 He's also been involved in dose reconstruction projects
2 at Idaho National Engineering Laboratory and for CDC.
3 He's worked on some of the historical Iodine releases
4 here in the Oak Ridge area, estimating doses of risks
5 from cancer from exposures in the Hanford area, so a
6 great deal of work involving dose reconstruction,
7 epidemiological tables -- radioepidemiological tables.

8 He's one of the main authors of IREP, so we're very
9 happy to have him here today and please give us the
10 recent modifications and updates and related --

11 **MR. THOMAS:** We'll certainly do that. Thank you for
12 those introductions, Dr. Ziemer.

13 Let me start by saying that this projector system is
14 really fancy and organized and -- so I applaud whoever
15 thought of this idea to have all presentations on the
16 same machine -- real streamlined. The only downside to
17 this is that we had to have our talks ready two or
18 three weeks ago, and this -- just so you know, this
19 kind of goes against our longstanding tradition of
20 making last-minute changes at midnight before a talk,
21 so midnight rolled around last night and it felt weird.
22 Okay. Iulian and I are going to tag team on this

1 presentation. I'm going to first take you through four
2 changes that have been made to IREP over the past --
3 actually these changes just got made, but IREP hasn't
4 changed for, as you know, many months.

5 On May the 1st of this year IREP was updated to version
6 5.2.1. Each of the changes that I discuss today are
7 extremely minor, which is the reason that we felt that
8 a minor difference in the version number was warranted.

9 This first slide that you'll see just briefly runs
10 through the updates, then I have at least one slide
11 prepared for each of these updates, so we'll get into
12 more details. Back last October Russ Henshaw from
13 NIOSH introduced to the Board this idea of the minimum
14 latency adjustment functions for leukemia and for
15 thyroid cancer. Then again in March he presented a
16 more finalized approach at how this would be handled.
17 These changes have now been implemented.

18 When entering the radon exposure information for
19 someone exposed to radon, in the previous version there
20 was a pull-down menu. It let the user select total or
21 annual. Turns out total -- never used. We removed
22 that pull-down menu to avoid confusion, doesn't make

1 any difference in the final outcome.

2 We've added some help. It's basically a link to tables
3 that are already in the NIOSH-IREP technical
4 documentation. We've provided links to those PDF
5 versions that can be downloaded, and we've provided a
6 help button that will give guidance when the dose is
7 being entered on which radiation type to select.

8 Now all of these updates are discussed on the OCAS web
9 site. There's a really detailed paragraph there that
10 gives these details.

11 Now when I talk about latency here, I'm talking about
12 the time between exposure and when the cancer was
13 diagnosed. The previous version of NIOSH-IREP assumed
14 a two-year minimum latency for leukemia and three years
15 for thyroid cancer, and so the word minimum there is
16 the key, because if an individual was exposed and then
17 got leukemia within two years or thyroid cancer within
18 three years, they were given a zero probability of
19 causation. All other cancers in the model would at
20 least give some small probability. There was no
21 uncertainty assigned for that minimum latency period.
22 It was two years and it was three years. The PC was

1 zero.

2 In the new model these revised latency adjustments now
3 result in non-zero risk for all times since exposure,
4 so even one year after, you're going to get a non-zero
5 result. And this change also results in no decrease in
6 probability of causation in any of the time since
7 exposure compared to the previous version.

8 Okay, now we get into this radon exposure change. The
9 pull-down menu that I mentioned in the previous version
10 allowed you to enter it as total or annual. The
11 revised version now just asks the user to enter
12 everything on an annual basis. Just like entering dose
13 information for an exposure, it's best to have it per
14 year. The model can handle that much better, so this
15 ensures that the latency period for lung cancer is
16 properly accounted for -- and this kind of goes back to
17 the previous slide. If someone got lung cancer two or
18 three or four years after their exposure, entering
19 their exposure information annually would allow the
20 code to properly account for that, plus this simplifies
21 the input screens for radon exposures.

22 Cancer model help, this is the help button right on the

1 primary input screen that gives guidance for the cancer
2 -- cancer type, cancer model pull-down menu. There's a
3 very full list of cancer models there to choose from,
4 but it's not every single cancer type that's out there.

5 And so the tables that NIOSH put together -- it's
6 about six, seven, eight pages long that give all the
7 cancers and then which cancer model in NIOSH-IREP to
8 select. Once you click that help button right from the
9 primary input screen, you can download the complete
10 NIOSH-IREP technical documentation, as well as tables 4
11 and 7. Here's what it looks like, and the red circle
12 indicates where the button has been added. When you
13 click on that, it takes you to this screen. You can
14 download table 4, which is the cancer models to be
15 used, the primary cancer sites. If all you know is a
16 secondary cancer site, table 7 is the place to go.
17 Then you can click here to download the complete
18 documentation.

19 We've added a help button also to give guidance on
20 which radiation type to select. This would be alphas,
21 electrons, those sorts of things. This has primarily
22 been added for the general public that might access the

1 site and want to look through these sorts of things.
2 Our dose reconstructors at ORAU are very knowledgeable
3 on all these sorts of things and they know which one to
4 select themselves, but this is a very well-written help
5 file. David Kocher will go into some more details this
6 afternoon about this one.

7 In that help file there there are important
8 distinctions made between exposures that were internal
9 and external exposures.

10 This is a screen shot of the previous version. The
11 radiation type, pull-down menu that I am discussing was
12 here (indicating). In the new version we just simply
13 added a help button there (indicating).

14 So those are the four changes that we've made to update
15 version 5.2.1. We're so excited you guys are here in
16 our hometown and we've got four of our staff here to
17 talk to you today.

18 Iulian, if you'll come ahead, we're ready to get into
19 some details about our recommended updates.

20 **DR. APOSTOAEI:** Can you hear me? Yes. Thank you for
21 introducing me, and I think you pronounced my name
22 very, very well. That's one of the best pronunciations

1 I've ever heard around here. So I hope you can
2 tolerate my accent, too, so...

3 Brian discussed about modifications that have already
4 been implemented in IREP. I'm going to talk about some
5 -- some updates that we here at SENES highly recommend
6 to NIOSH and to the Advisory Board. We're going to
7 talk about a couple of updates. The first one relates
8 to bone cancer. Bone cancer and especially for the
9 latency period for bone cancer.

10 At this point bone cancer has a latency period which is
11 assigned the same value as for all solid tumors, which
12 is about ten years. And it seems, based on more recent
13 research that we did, that the latency should be lower
14 than ten years -- an average of ten years, maybe about
15 five years. And this change would be very claimant-
16 friendly because it will produce risks at lower times,
17 shorter times after exposure.

18 Another recommended update has to do with the
19 application of the risk coefficients for thyroid
20 cancer, and I'm going to discuss about this update in
21 more detail.

22 As we speak, in IREP the thyroid risk coefficients for

1 exposure at ages less than 20 are reduced by a factor
2 equal to the radiation effectiveness factor for X-ray -
3 - X-rays. And this represents the state of knowledge
4 that we had about a year or so ago when we first
5 released IREP. And here is the rationale behind this
6 reduction factor.

7 IREP uses a risk coefficient obtained from studies of
8 individuals exposed to high energy gamma rays and was
9 designed to make use of them. We have risk
10 coefficients for individual exposed to high energy
11 gamma rays for all cancers other than for thyroid. The
12 risk coefficients for thyroid cancers are obtained from
13 a pooled analysis of studies of children exposed to X-
14 rays and also gamma rays, and also adults exposed to X-
15 rays and gamma rays. It just turns out that the risk
16 coefficients for children are dominated by the studies
17 in which patients were exposed to X-rays, and adults --
18 the risk coefficients for adults are dominated by the
19 gamma rays -- by the exposures to the gamma rays by the
20 A-bomb survivor studies.

21 We believe that X-rays are more effective in inducing
22 thyroid cancer than high energy gamma rays, and David

1 Kocher will talk about this a little bit later on, and
2 I think you had a presentation on the effectiveness
3 factors.

4 So of course if the risk coefficients for thyroid
5 cancer for childhood exposure are dominated by X-rays
6 and X-rays are more effective in inducing cancer, then
7 we had to reduce them by a factor equal to their
8 effectiveness factor.

9 However, we learned some more about the studies, these
10 pooled analyses, and we learned that really there is no
11 important difference between the risk coefficients from
12 exposure to X-rays and the risk coefficients from
13 exposure to high energy gamma rays. And let me show
14 you a sample of the data.

15 Here this graph shows the risk coefficients for an
16 exposure to radiation at exposure less than 15. The
17 numbers in green here are the studies in which children
18 were exposed to X-rays and the part in blue is the
19 study for the A-bomb survivors. As you can see, if we
20 look at the risk coefficients from the A-bomb
21 survivors, the risk coefficient does not -- is not very
22 different from the risk coefficient that would be

1 obtained when we pooled all this data together. So
2 some of the risk coefficients from exposure to X-rays
3 are lower, some of them are higher. When you mix them
4 up, you will get a risk coefficient that is very close
5 to the one obtained from gamma rays.

6 So a possible explanation for such an effect is that
7 the X-ray exposures were applied to the patients in the
8 fractionated mode, therefore induced a lower risk, in a
9 similar way as a DDREF is applied.

10 So the conclusion is that the risk coefficients from
11 the pooled analysis which comes from X-rays and gamma
12 rays combined are consistent and that a good surrogate
13 for the risk coefficient that we need would be those
14 from exposure to high energy gamma rays.

15 So our recommendation is to update the application of
16 risk coefficients for thyroid cancer by removing the
17 reduction factor for exposure at ages less than 20.

18 Let me show you what kind of an effect this actual
19 recommendation has. These are the risk coefficients,
20 which are the excess relative risk per any dose for
21 thyroid cancer as a function of age at exposure, and
22 these are the values currently implemented in IREP.

1 And you can see a decrease in the risk with age at
2 exposure with only one exception. Here there is an
3 increase here at age 20 because these values have been
4 artificially reduced and the data that we have on
5 thyroid cancer indicated there risks should decrease
6 continuously.

7 If we apply this update, the risk coefficients, now in
8 blue, you will see that there will be no difference for
9 exposures in adult. The risk coefficients for ages at
10 exposure 50 and 20 will be increased and, you know, the
11 data will now show -- the risk coefficients will show a
12 continuous decrease with age at exposure.

13 Just a reminder, this update will affect only a small
14 portion, will affect only categories -- exposure at
15 ages 15 to 19, so it's probably a very small impact on
16 the total number of claims. But nevertheless, this --
17 we believe that this proposed update is scientifically
18 defensible. It's also claimant-friendly for age at
19 exposure under 20. It increases the risk. And also
20 will -- has already been approved by the National
21 Cancer Institute and they already implemented in their
22 version of IREP, which is the new version of the

1 radioepidemiological tables. So we believe that it's
2 probably best to include these updates, even in the
3 current -- in the new version of IREP and this is our
4 recommendation if you want to consider it. Thank you
5 very much. So let us know -- both of us --

6 **DR. ZIEMER:** Thank you. We'll open the floor for
7 questions to either of the presenters, and I think in
8 addition I might point out that two of the other SENES
9 people are here. Owen Hoffman and David Kocher are
10 also here with us today at -- I believe they're both
11 still here, but let's address our questions to the two
12 presenters here, if there are questions.

13 Okay, Dr. Roessler.

14 **DR. ROESSLER:** The -- one proposed update affects the
15 ages under 20. How many people -- I mean that doesn't
16 seem like it's really pertinent to this particular
17 study. It may be pertinent in a big --

18 **DR. APOSTOAEI:** Yes, the cutoff for the claims is age
19 15, so --

20 **DR. ROESSLER:** But in reality, how many people actually
21 would fall in that category?

22 **DR. APOSTOAEI:** Very few. Very few.

1 **DR. ROESSLER:** Yeah, I just wondered about that.

2 **DR. ZIEMER:** Thank you. Other questions? This Board
3 gave a kind of approval to the previous update. We
4 didn't think the previous one was overly significant,
5 but we went on record as being in agreement with it.
6 It's never quite clear where the line is between
7 significant and a non-significant update. I'm not sure
8 anybody knows exactly where that is. I believe that
9 this is being presented to as a -- more of a tweak. In
10 fact, it's -- shows, as the change in the number of the
11 version, it's seen I think by the group as being not a
12 significant update. It certainly is claimant-friendly.

13 It affects, as Dr. Roessler suggested, very few
14 potential claimants, but nonetheless the Board may want
15 to be on record as to whether they are supportive of
16 this proposed change, although it -- I don't believe
17 it's required. Larry.

18 **MR. ELLIOTT:** NIOSH is taking this into consideration
19 and we're talking with our colleagues at NCI about it.

20 I would offer also that there are no claims relevant
21 to this particular change, and we would -- if we
22 thought it was something we'd like to see done, we'd

1 bring it to the Board for your --

2 **DR. ZIEMER:** So your staff is not --

3 **MR. ELLIOTT:** -- your deliberations.

4 **DR. ZIEMER:** -- yet at a point where you're making a
5 recommendation --

6 **MR. ELLIOTT:** No.

7 **DR. ZIEMER:** -- to the Board.

8 **MR. ELLIOTT:** No, we're not.

9 **DR. ZIEMER:** So it would be premature I think then in
10 that case for us to take any action today, but if you
11 have questions, we certainly want to raise them. Dr.
12 Melius.

13 **DR. MELIUS:** Can I ask Larry a question? I'm a little
14 confused procedurally. What about the -- the bone
15 cancer change, the -- or where do you -- where does
16 NIOSH stand with --

17 **MR. ELLIOTT:** Well, we're -- we'd like to hear more
18 about that ourselves. We'd like to know more about
19 that. We -- I think the first I've heard about it was
20 this morning.

21 **DR. MELIUS:** Okay.

22 **MR. ELLIOTT:** I don't know if Jim or others had heard

1 about the bone cancer modification, but we're in
2 concert with NCI as much as possible and we're talking
3 with Charles Land and others there about what -- what
4 this would mean for the program.

5 Once we have one of these that we think we need to
6 bring to the Board, we will. These were -- these
7 things were for informational purposes to let you know
8 that this is on -- on the horizon, and we need to get
9 out thoughts collected and understand what they mean to
10 the program.

11 **DR. ZIEMER:** Okay. Thank you. Other questions or
12 comments? Tony and then Mark.

13 **DR. ANDRADE:** I'd be curious, perhaps you have a number
14 at the top of your head, and if not, that's okay. If
15 we can hear it later, that'd be nice. What were the
16 sizes of the cohorts in the studies that produced these
17 new results about the effectiveness, say for example,
18 in the case of children, X-rays being just as effective
19 as high energy gamma rays for production -- for the
20 generation of cancer?

21 **DR. APOSTOAEI:** There are tens of thousands of
22 children, including the exposures of children --

1 **DR. ZIEMER:** Is the mike on? I mean --

2 **DR. APOSTOAEI:** No, excuse me. Can you hear me?

3 **DR. ZIEMER:** Maybe just raise it up a little.

4 **DR. APOSTOAEI:** Yeah, so the studies that -- included

5 exposures to X-ray by -- the children by X-rays

6 contained thousands of -- and tens of thousands of

7 children, and this is a much larger number than the

8 number of children included in the A-bomb survivors.

9 And for adults, we have only the A-bomb survivors, with

10 very few exposures by adults to X-rays.

11 **DR. ZIEMER:** Mark?

12 **MR. GRIFFON:** I think you just answered my question. I

13 was going to ask for a breakout of -- of the older age

14 groups, what studies you relied on there, but I think

15 also Larry answered that they're still reviewing this

16 so --

17 **DR. APOSTOAEI:** The way the data is organized right

18 now, I think exposures as an adults contain only

19 exposures -- to the A-bomb survivors from Japan, so...

20 **DR. ZIEMER:** Okay. Thank you very much, gentlemen, for

21 that input.

22 Just before we take a break I want to call attention to

1 the Board to the fact that tomorrow afternoon we will
2 be dealing with some minutes. The tab near the back of
3 your packet which is labeled draft minutes, meeting 11
4 -- that's the February meeting -- you are going to be
5 receiving shortly -- this morning or early afternoon --
6 a substitute packet. This -- this early draft has
7 subsequently been reviewed by the Chairman and marked
8 up and there will be a new -- more concise draft, I'll
9 call it and describe it that way -- which will replace
10 this, which will require somewhat less reading for you
11 tonight as you prepare for tomorrow's docket. But in
12 any event, at that point you can -- well, you're
13 certainly welcome to read through these minutes, as
14 well. Maybe you'll like them better than the
15 Chairman's version. But in any event, there will be an
16 official draft that you'll receive sometime today.
17 Cori will distribute it.

18 With that, let's take a 15-minute break.

19 (Whereupon, a recess was taken.)

20 **THE UK COMPENSATION SCHEME**

21 **FOR RADIATION-LINKED DISEASES**

22 **DR. ZIEMER:** We're pleased to have some special guests

1 with us today who are going to introduce us to the
2 United Kingdom's Compensation Scheme for Radiation-
3 Linked Diseases. That's the UKCSFRLD. That's what we
4 would call it here, and I don't know how we would
5 pronounce that. In any event, we're pleased -- and let
6 me introduce briefly all three of the gentlemen who are
7 here with us today.

8 Michael Lewis -- and when I give your name, just wave
9 so everybody knows who is who -- or whom. Michael
10 Lewis is a health physicist. He's had 18 years of
11 experience with the -- in the United Kingdom in the
12 nuclear industry there. Since March of 2001 he has
13 been Executive Secretary of the United Kingdom
14 compensation scheme, and in that role he's responsible
15 for management and operation of the scheme. He's the
16 only full-time officer of the compensation scheme,
17 although he's able to call on numerous colleagues in
18 the scheme's members for assistance in building case
19 assessments.

20 And then John Billard is National Secretary with the
21 Trade Union Prospect, which has 105,000 members, mainly
22 in science and engineering in the United Kingdom. He's

1 been very active in promoting the compensation scheme
2 for actually a little over a decade now.

3 And then Dr. Andy Slovak is the Chief Medical Officer -
4 - British Nuclear Fuel, BNFL is -- I don't know if I'd
5 want to call them the contractor, but they're the group
6 responsible for handling this, and he's their chief
7 medical officer and is responsible for development of
8 standards and review of the company's Occupational
9 Health Services, and then he has an oversight role in
10 the medical aspects of radiation protection and
11 radiation science, including epidemiology,
12 radiobiology, genetics, and in these cases this extends
13 to chairing the UK compensation scheme's Technical
14 Working Party, as they call it. That's the body that's
15 charged with tracking developments in the technical
16 fields that are relevant to the scheme and recommending
17 necessary changes.

18 So we're pleased to have all three of these gentlemen
19 here. Let's see, we're going to begin with Mr. Lewis,
20 and then Mr. Billard and then Dr. Slovak.

21 **MR. LEWIS:** Good morning, ladies and gentlemen. It's a
22 pleasure to be here to be able to tell you something

1 about the UK Scheme, which is what we call it, rather
2 than the UKCSRLD.

3 As you can imagine, we've observed the development and
4 inception of your compensation program with a great
5 deal of interest, not least because of the number of
6 potential challenges it presents to the operation of
7 our own scheme. I would also hope that this
8 opportunity will give yourselves some chance to
9 appreciate how another system works, and may even go as
10 far as informing some of the decisions you have to make
11 along the way.

12 What I'd like to do is tell you something about the
13 background and history of our scheme, and explain
14 something of how we process individual cases and how we
15 manage the scheme between the effective owners, the
16 unions and the various employers.

17 John will then tell you something of the union
18 perspective of the scheme. Andy will, as the chairman
19 of the scheme's Technical Working Party, will discuss
20 some aspects of the technical basis that we use.

21 To understand why we have the scheme in the first
22 place, it's perhaps necessary to understand the legal

1 situation in the UK. In the UK we have a thing called
2 the Nuclear Installations Act, which requires that any
3 site where nuclear operations occur needs to have a
4 site license. And that Act also says any company that
5 holds a license is responsible for the harm caused by
6 those operations. There's no need under the Nuclear
7 Installations Act to prove negligence, so simply by
8 proving that any harm that you suffer has been caused
9 by those nuclear operations would lead the employer to
10 be liable, or at least the license -- the site license-
11 holder to be liable.

12 And under that Act there were five trades-union-
13 sponsored actions against BNFL in the late 1970's. The
14 first thing to know is that they were very lengthy. It
15 took around five years for them to get started and then
16 to get to the steps of the court. They were very
17 expensive. There aren't any official figures on how
18 much, but between the employers and the unions we're
19 talking well into -- you know, well over £1 million, UK
20 money.

21 They were very traumatic for the families concerned
22 because they were under immediate spotlight for five or

1 six years, as well as under a great deal of pressure in
2 their own local community. And eventually they were
3 settled out of court, which doesn't really mean that
4 you've got the greatest success out of the legal system
5 that's possible.

6 The reaction to this from BNFL and the unions was that
7 there was a great deal of concern -- the distress
8 caused to the claimants and the families, the duration
9 and the actual financial cost to both parties. BNFL
10 were concerned that it might actually be possible for a
11 claimant to win such a claim. The unions were still
12 concerned that it was very difficult to actually prove
13 causation in a court.

14 And both wanted a workable alternative as a way
15 forward, but it was clear that if there was going to be
16 a workable alternative, it would have to be faster than
17 the court process. It would have to cost both the
18 employer and the unions a lot less money. It would
19 need to be more generous to the claimants to give them
20 an incentive to come to any alternative rather than
21 going to court. And obviously it would need to be much
22 less traumatic to those involved in making claims.

1 After a great deal of discussion between the two
2 parties, the Compensation Scheme came into being at the
3 end of 1982, initially for a trial period of five
4 years, and the first claim was actually received in
5 November, 1982. At that time the Scheme took mortality
6 cases only, cases where the claimants had died of a
7 radiation-linked disease. It was unique at the time in
8 that it used the causation probability methodology, and
9 that methodology was based on an excess absolute risk
10 model which was derived from ICRP 26, which was -- at
11 that time was felt to be the best scientific basis.

12 After that initial period of operation, the Scheme was
13 reviewed in 1966 (sic) and both parties felt that the
14 operation had been successful and decided to carry on.

15 At that time we also extended the Scheme to include
16 morbidity cases, cases where the claimants were still
17 alive, and the PC methodology was reviewed and
18 generally supported by the publication of the NIH
19 radioepidemiology tables over here in 1985 and the
20 associated NRC review.

21 We did actually further revise the technical basis in
22 1991 following the publication of BEIR V, and that

1 remains the basis of our Scheme today.

2 The way we process cases is that every application has
3 to pass a test of eligibility, and we then screen. If
4 the screening test is passed, we then do a more
5 detailed investigation, which is called a factual
6 report. That's used to determine the case, and it then
7 moves to payment, which, to use a -- we use the UK
8 legal term, which is quantum. Quantum in the UK is the
9 amount of money you pay in a settlement for an injury
10 claim.

11 The eligibility criteria that we have under our Scheme
12 is that claimants must have been employed by one of the
13 Scheme participating employers, they must be a member
14 or have been a member of one of the Scheme
15 participating unions, and they must either have a
16 radiation dose record with the employer or at least
17 there must be sufficient evidence so we can infer an
18 occupational radiation exposure history to allow us to
19 causation probability calculation. And obviously they
20 must have contracted or died from a disease that's
21 covered by the Scheme. And if those cases -- if cases
22 are eligible, we then move to screening.

1 The idea of screening is to identify potentially
2 successful cases. We take the dose history which are
3 collated and, in some cases, slightly enhanced by what
4 we call protocols, which are agreed procedures for each
5 of the employers who compile dose histories. In some
6 cases we do use upper bound data in order to speed the
7 process of the case through the screening period. We
8 assign one of six schedules, which are our dose risk
9 models, dependent on the ICD(8) coding of the disease
10 that the claimant is diagnosed with, and that -- they
11 are the basis that we use to make the causation
12 probability calculation.

13 If the case produces a causation probability of less
14 than 15 percent, it's deemed to have failed the
15 screening process. I then inform the Union, and the
16 Union informs the claimant and in almost all cases
17 that's an end of the matter. If a case achieves a
18 causation probability of 15 percent or greater, there
19 is then a deeper investigation of the case done in
20 terms of a factual report, and that factual report is
21 then used as the basis for the final determination of
22 the Scheme, which again is a causation probability

1 calculation.

2 Based on the causation probability that comes out of
3 the factual report, we employ a system called
4 proportional recovery. This means that if you achieve
5 a causation probability between 20 and 30 percent, you
6 will receive a quarter of quantum, which is the full
7 sum payable. And then it goes on a sliding scale up to
8 50 percent, and 50 percent and over, claimants would
9 receive the full sum of compensation, exactly as they
10 would in UK law.

11 There were a small number of cases where special
12 factors apply, where the Scheme schedules may be
13 confused or confounded, and those cases are determined
14 by what we call an expert panel. The types of cases
15 the expert panel would look at are cases of leukemia
16 where there is evidence of radiation exposure below the
17 age of 21, respiratory cases with any evidence of a
18 smoking history which achieve a causation probability
19 of 15 percent or greater, and female breast cancer and
20 thyroid cancer cases which achieve a causation
21 probability of 15 percent or greater. And the panel
22 determines a fractional payment in exactly the same way

1 as the payment schedule does.

2 Once a claim is awarded payment, it then moves to
3 quantum. The idea of quantum is that the full sum is
4 calculated in exactly the same way as a case would be
5 if it was successful in a UK court. The employer and
6 the Union both appoint solicitors at this point who are
7 solicitors experienced in dealing with quantum matters,
8 and they agree the full sum. The payment fraction is
9 then applied and that determines the settlement that's
10 given to the claimant.

11 We have a set of agreed time scales for trying to
12 process cases. The principal time scale that we work
13 to is the six months to issue screening data. That's
14 the point at which the claimant would know whether they
15 were going to receive payment or not. There's the
16 opportunity at that point for claimants to challenge or
17 to raise any concerns they have about their assessment,
18 but the rule of thumb we work to is that within six
19 months we try to let claimants know whether they are
20 going to get something or not. And we achieve that in
21 about 70 to 80 percent of cases, depending on the
22 employer.

1 The Unions then have three months to respond to
2 screening data if the case has failed, or one month if
3 it passes. I mean obviously if it passes, there's
4 probably a lot less dialogue to take place between the
5 Union and the claimant.

6 The factual report is prepared within three months by
7 the individual employer, agreed within one month by the
8 Union, and then determined -- usually in a matter of
9 days rather than a month -- once it is agreed. So the
10 total target time scale is to run through the Scheme --
11 and if you like, all the I's dotted and all the T's
12 crossed -- in nine months for failed cases and 12
13 months for cases which pass.

14 There is an alternative to the use of our Scheme.

15 Again, our Scheme is not prescribed by legislation.

16 It's a voluntary agreement between the employers and
17 the Unions, so we can't make it compulsory and we don't
18 seek to make it compulsory. Claimants can still take
19 legal action under the Nuclear Installations Act,
20 although the only thing we ask is if they are claiming
21 under the Scheme, that they stay any legal action for
22 the duration it takes us to assess that case under the

1 Scheme. And if an employer pays a settlement to a
2 claimant, I think it's fairly common sense that the
3 employer asks the claimant to sign that they will not
4 pursue the employer under the Nuclear Installations Act
5 for the compensation they've just been paid.

6 And one important feature is that the participants --
7 principally the employees and the Unions -- are bound
8 by the principle of the Scheme. That means the workers
9 have the security that the Scheme is available to them,
10 with all its generousities over and above the UK legal
11 process. And it also means that the employers are
12 protected in some respects in that the -- in that
13 Unions will not support cases through the courts where
14 it is more appropriate for them to come through the
15 Scheme.

16 If we look at the number of cases handled, I think if
17 you compare these to the sorts of figures that David
18 Sundin was talking about earlier, you can see that in
19 one fell swoop last May we've gone from being a world
20 leader to a drop in the ocean. In 20 years we've
21 handled just about 1,100 cases. It's more a reflection
22 of the size of our nuclear industry, I think, than any

1 personal inefficiency. Around 50 or 60 of those cases
2 are currently ongoing, and in total 94 cases have
3 resulted in payment. One of the important things to
4 notice about those 94 is that 66 of those have been
5 made at less than full payment, so if they'd have gone
6 through the UK legal system and the UK legal system had
7 adopted a similar assessment procedure to that we use,
8 they wouldn't have achieved a payment in court, whereas
9 we've given them compensation. And the total we've
10 paid out so far -- again, you know, we're talking about
11 drops in the ocean compared with you -- we've paid £5
12 million out so far, which is of the order of \$8
13 million.

14 The way we manage the Scheme is that each employer or
15 historical group of employers has a Compensation Scheme
16 Management Board, and they manage issues pertaining to
17 those particular employers, and there are five of those
18 at the present time. I won't go through them, but
19 there they are.

20 The way a Management Board operates is that it's
21 established by the Unions and the employer signing a
22 morbidity and mortality agreement, and they are pretty

1 much identical documents throughout the five Management
2 Boards. The employer provides dosimetry protocols
3 which are vetted by the Technical Working Party and
4 endorsed by both employers and managers on the
5 Management Board -- sorry, employers and Unions on the
6 Management Board. And the Management Board has its own
7 internal procedures for dealing with claims.

8 Management Boards nominate one management
9 representative and two Union representatives to sit on
10 the Scheme Council, which is the overarching management
11 board of the Scheme, which makes sure that the Scheme
12 operates consistently across the whole of the employer
13 group. The Council meets once a year, and is actually
14 chaired by the BNFL UK Management Board chair, and it's
15 advised on technical matters by the Technical Working
16 Party.

17 I also mentioned we have an expert panel who consider
18 some of the more difficult -- technically difficult
19 cases. The expert panel is a group of internationally-
20 recognized independent scientists. The independence is
21 important there. They are independent from the Scheme
22 process otherwise, and from each of the employers and

1 Unions, so we are able to offer the comfort to
2 claimants who are assessed by the panel that their
3 deliberations will be out with any -- any interests of
4 the participants. And at the moment they're averaging
5 about one meeting a year. They usually consider two or
6 -- two, three or four cases at their meetings.

7 We also have this body, the Technical Working Party,
8 which I won't dwell on because Andy's going to speak
9 about that. Andy, as BNFL Chief Medical Officer,
10 chairs that body, and it exists to advise principally
11 counsel, but also the management boards on technical
12 matters.

13 The way that we usually demonstrate the success of our
14 Scheme is the way that it's expanded from BNFL in 1982
15 throughout the UK nuclear industry. The United Kingdom
16 Atomic Energy Authority joined in '87, Urenco* and the
17 nuclear generators joined in '93, the Ministry of
18 Defense and the atomic weapons establishment joined in
19 '94, nuclear dockyards in '97, and a company called
20 Babcock Naval Services -- who've just taken over
21 running two of the nuclear submarine bases in Scotland
22 -- are joining this year.

1 We've also expanded throughout the UK trades unions.
2 Initially the Union members were those unions who
3 represented the BNFL work force, and there were five of
4 them. As the Scheme has extended through the other
5 employers, the other trades unions who represent their
6 work force have joined, and we now have all the unions
7 in the UK nuclear industry represented, and they cover
8 the majority of workers within the industry.
9 And I think that's probably the appropriate point at
10 which I'll hand over to John, who will say something
11 about the union perspective.

12 **MR. BILLARD:** Good morning. Can I say first of all I
13 have to congratulate you on the work you're doing in
14 relation to your compensation arrangements for
15 radiation workers, and I'm pleased to say something
16 about the trade union involvement in the Scheme, which
17 Mike has so far explained.
18 And the first think I think is important for us is that
19 the -- we have a collective agreement with the
20 employers in the UK, which effectively means that the
21 agreements are not legally enforceable, in common with
22 all other collective agreements in the UK. This is --

1 our Scheme is an alternative to legal action, as Mike
2 has explained. Therefore the agreement we have is
3 known as -- it's "Binding in Honor" between the
4 parties. It would, therefore -- there will be nothing
5 to prevent any one of the parties walking away from it,
6 but that would cause a number of industrial
7 difficulties. And over the last 20 years I think we
8 can truthfully say that all parties have worked
9 together very well to make the Scheme the success it
10 is.

11 The Scheme, as originally devised, was designed only
12 for trade union members, and the reason for that of
13 course is the nuclear industry in the UK -- highly
14 regulated, highly organized, the great majority of
15 workers in the UK nuclear industry aren't trade union
16 members. So therefore it naturally fell to the trade
17 unions to organize on their behalf in relation to the
18 creation of the Scheme and its developments in 1992.
19 Now as Mike has said, the alternative is a lengthy
20 process, and we are there to give a service to our
21 members. And it's absolutely essential that those who
22 are taking part in the Scheme have whole and complete

1 confidence in what is being done on their behalf.

2 We're there to present personal injury claims, if
3 necessary. And as Mike has said, we wanted to avoid
4 the lengthy and protracted and expensive process of
5 legal action.

6 But the important thing is -- I'm sure you will have
7 experienced this -- a worker is in the nuclear
8 industry, experiences radiation during their working
9 life, gets cancer and therefore of course there is a
10 direct link which the claimant or the relatives seek to
11 make, and therefore in order to persuade them or
12 convince them in the event their claim is not
13 successful -- and that's nine times out of ten, as far
14 as our Scheme is concerned -- then those claimants have
15 to be satisfied that the Scheme we're operating is
16 operating under the latest scientific and medical
17 knowledge. And that means that the members who are
18 involved in claiming or their relatives or dependents
19 would have to be able to go to them to say that we, on
20 their behalf, have confidence in the outcome. And that
21 same confidence has led employers to join the Scheme in
22 the same way that Mike has described. And the history

1 of the UK nuclear industry is one of a public sector
2 industry.

3 Nuclear research and development, nuclear in defense,
4 has always been part of the UK public sector. But
5 we've now moved to the stage where much of that is now
6 operated by the private sector, and certainly the
7 decommissioning task which is going to go on for
8 another 50 or 80 years is going to be a private sector
9 function and therefore we require those private sector
10 employers to join the Scheme. And they have to have
11 the same confidence that we do, because clearly if
12 we're talking about private sector employers, we're
13 talking about private sector money which may be paid in
14 compensation.

15 Therefore one can see that the relationship between the
16 parties in respect to trade unions, employers and the
17 management of the Scheme is effectively a tripartite
18 arrangement, and I've described it as a three-legged
19 stool. If one is removed, then the thing collapses.
20 Trade unions and employers have good relationships and
21 they have bad relationship. They are there to --
22 unions are there to represent their members. The

1 employers are there generally to represent their
2 shareholders or their interest. And the employer/trade
3 union relationship, going back well over 100 years,
4 occasionally has its confrontational aspects. But I
5 can say that as far as we're concerned in relation to
6 the compensation Scheme, we operate a dance floor
7 rather than a boxing ring. And we are there to work
8 together for the good of claimants and indeed the good
9 of employers.

10 Now nevertheless, in relation to the very interesting
11 developments that we've been listening about and
12 reading about in the US program, there are some issues
13 for the workers, and that is why we are particularly
14 interested in making this presentation and hearing what
15 you have to say.

16 One of the things that immediately struck my attention
17 was the concept of the Special Exposure Cohort, and I
18 think when I first read details of the US program it
19 was the SEC which stood out immediately. I think when
20 I'd gotten beyond that and started to read and
21 understand a little more about other aspects of your
22 arrangements, it became clear to me you were very much

1 closer to what we have been trying to do over the last
2 20 years, but the Special Exposure Cohort of course
3 cuts out a whole series of stages. In other words, you
4 worked at Place A, you worked there for Time B, you got
5 Cancer C, therefore you get money.

6 Now I have to say we've probably got quite a few
7 thousand members in the UK who would like that Scheme,
8 as well. Mike, for example, would probably be out of
9 most of his job. I guess Andy wouldn't have a lot to
10 do, either. But the difficulty is -- and I have to say
11 that we do have a number of locations in the UK where
12 radiation dose records haven't been kept as carefully
13 as they should have been, and I'm talking about 20, 30
14 years ago; no doubt where practices were interesting,
15 to say the least, and which have certainly changed as
16 the industry has matured, and therefore there is an
17 attraction. However, our judgment is, as trade unions,
18 is that we would never be able to persuade any employer
19 to join such an arrangement because they would see it
20 as a liability -- a big liability, particularly --
21 particularly if you're dealing with the private sector,
22 which we are, because there's no government money

1 directly -- no government money directly involved in
2 the operation of this Scheme.

3 There are other interesting aspects of your scheme
4 which I'm pleased to learn more about, and that is in
5 relation to generosity factors. I know Andy will say
6 something about that when he takes over from me
7 shortly. I suppose if we take any one particular case,
8 particularly one which might be on the -- right on the
9 limit of where the compensation is paid or not, and we
10 apply that case to your scheme, that individual may be
11 successful under your scheme and not ours. But
12 obviously that could equally work both ways. Our
13 judgments are that, taken as a whole, generally the
14 success rate of your scheme compared with ours,
15 excepting the SEC, is broadly about the same.

16 So I conclude on those comments, ladies and gentlemen.

17 It's been a pleasure to talk to you. And if you have
18 any questions, I'll deal with those at the end, and I
19 hand over to my colleague, Dr. Andy Slovak.

20 **DR. SLOVAK:** Thanks very much, John. I'm going to
21 briefly run through -- review some of the technical
22 issues in the Scheme. And particularly I'm going to

1 draw out some comparisons with your scheme and some
2 rather particular features about where it's going.
3 I'll preface these remarks by saying that I had
4 wonderful sense of familiarity with the delays and the
5 frustrations and the irritations associated with the
6 setup of your scheme. The running of it, I can assure
7 you, will be just the same, and especially any
8 challenges and adaptations in the future.

9 I was particularly taken also with the concept of pigs
10 going down pythons, and I should add to that that
11 greasing is sometimes difficult, and it doesn't get you
12 past the pinch point.

13 Very briefly, you will see a series of resonances in
14 what you're doing and what we've been doing for over 20
15 years, and the process of the Technical Working Party
16 of which I chair is to make sure that all of these
17 factors march in line with the advancement of science
18 and understanding in these areas.

19 Our technical basis, as Mike has said, is based on BEIR
20 V. We have a relatively simple set of schedules in
21 comparison with yourselves, with many things tucked
22 into something of a dust bit of other tissues, and

1 we're going to have an extremely fruitful time in the
2 future, considering all of the issues associated with
3 your -- your many schedules and our relatively few, and
4 how that works for different people.

5 Here's the technical headlines of what we think are
6 going to be some interesting areas and some possibly
7 difficult areas of intercomparison between the US and
8 the UK scheme. I've already highlighted the seven
9 versus 34 dose models that you have, some of which I
10 would say -- and perhaps slightly controversially --
11 may be straining scientific credulity a little.

12 There are a number of differences in the way that we
13 approach dosimetry. We mainly use statutory dose
14 records and some reconstruction. We don't make
15 adjustments for the way the dosimetry was done for the
16 geometry of the radiation nor the tissue attenuation.
17 And also we have this use of the 50 percent causation
18 probability value, rather than the 99 percent
19 confidence interval.

20 We also have some cancers which are quite specifically
21 non-eligible. These are the ones that many of you who
22 have a technical interest will recognize, and some of

1 them are arguable, and some of them no doubt will be
2 argued in the future.

3 Like all good nuclear scientists, we can't actually
4 leave well alone, so that we've taken BEIR and we've
5 adjusted various aspects of it to make life easier for
6 ourselves, and also to provide some level of in-built
7 generosity to claimants. And I think one of the most
8 interesting things I've already learned from this
9 morning is that, similar to ourselves, there is a
10 spirit here in this meeting of wishing to be generous
11 and wishing to err on the side of benefitting claimants
12 rather than taking some kind of narrow, legalistic sort
13 of highly scientific point of view.

14 Now we come to what the Technical Working Party does.
15 This is the dance floor, although I have to tell you
16 that I don't dance so good, and many of the members
17 would have some difficulty in doing it, but
18 nevertheless, it is a scientific dance floor. Any
19 party can raise an issue, a scientific issue, and this
20 is done at a council or a board management level rather
21 than a technical level, so we are told what to do by
22 our political masters, if you wish. It is then down to

1 us to come back to them and say well, you know, this is
2 how we see the problem. This is the technical scope of
3 the problem, this is how far we're going to go. And
4 they will say okay, that seems sensible. Or they will
5 ask us to go 'round and think again. Once we get into
6 the Technical Working Party, we tend to be very
7 inclusive. Anyone can come along who is representing
8 one of the parties to the discussion, and we'll listen
9 to all inputs very carefully and factor those into the
10 discussion. So it's very much a forum, and again,
11 there is some resonances with one of the papers that we
12 had just before the break of a free and open discussion
13 of scientific issues and a consensual agreement to the
14 approach then taken.

15 The next item here just shows some examples of issues
16 that we've addressed over the last few years. Again,
17 I keep on saying this, there will be all sorts of
18 resonances of familiarity here -- non-uniform neutron
19 dose; update of site histories, very important and not
20 sometimes immediately obvious and has some kind of
21 agreement -- agreed view of what happened on particular
22 sites and when it happened and things like that, very

1 useful to the operation of the Scheme.

2 Quite clearly, you guys have come in like the whales
3 and suddenly we're the minnows. You know, minnows get
4 a little bit agitated when whales come along, so you
5 know, we want to carefully watch what you're doing and
6 very much interact with what you're doing for the
7 future. Hopefully it'll be very much a bipartite
8 approach, and one of the things that we've done which I
9 think is perhaps an example of the sort of maturity of
10 the Scheme is that we've begun to look ahead and say
11 well, you know, what happens when you're going to start
12 getting specific genomic proteomic* markers of
13 radiation related disease, how that's going to affect
14 the compensation scheme, are there going to be winners
15 and losers. It may comfort you to know that our
16 conclusion was well, it's much too early to decide.
17 So moving on now to what I think are the main horizon
18 issues for us technically, we do think that there's
19 going to be considerable benefit and value in having
20 some kind of level of formal interchange at a
21 scientific level with yourselves. We quite clearly
22 have a set of resonances and sympathies in our attitude

1 and approach.

2 We are awaiting with great eagerness, as I suspect you
3 are, the advent of the new, somewhat-delayed NIH
4 tables, and any pressure you can bring to draw those
5 forward would be greatly appreciated.

6 And another one which I think is going to get very
7 difficult is non-cancer outcomes, which are beginning
8 to come up in A-bomb survivors associated with
9 radiation dose. Perhaps something not for the
10 immediate future, but certainly just over the horizon.

11 Okay, so we conclude -- I guess we conclude on time.

12 It's been argued to you, and I think the very fact that
13 three of are wearing suits and ties can turn up in the
14 same place at the same time, that the Scheme has
15 demonstrated over 20-plus years that it enjoys
16 continued support, not only from the employers and the
17 unions, but also from the scientific community. This
18 is supported by its extension throughout the UK nuclear
19 sector. We are -- we note and obtain comfort from the
20 fact that you're using the same basic methodology as we
21 are in terms of causation probability. However, the
22 DoE scheme does raise some issues for us in the UK.

1 Now I do know that that's a slightly challenging
2 statement, particularly as we've left the word but we
3 still have much in common there. We -- I'll repeat
4 what I said a little bit earlier. We are very keen to
5 maintain a functional scientific dialogue, particularly
6 and importantly for the benefit of claimants to produce
7 an outcome which is fast, caring and hassle-free.
8 That's the end of what I have to say. We're very happy
9 to take questions and I'm inviting my colleagues to
10 rejoin me for that.

11 **DR. ZIEMER:** Thank you very much, and we'll begin
12 questioning with Dr. Roessler.

13 **DR. ROESSLER:** I was going to ask Mike this question,
14 and then John, but I think you're the right one to ask
15 now, Andy, that you have talked a little bit more about
16 the updating of science, or using the best science.
17 And now that the new dosimetry is out from Hiroshima
18 and Nagasaki, and now that it appears it won't take
19 very long for it to continue on and get to -- so that
20 BEIR VII will be able to finish up, I assume you have a
21 team ready then to go to evaluate BEIR VII and be ready
22 to make any adjustments, if necessary.

1 **DR. SLOVAK:** Well, we certainly have that very much in
2 focus, and you know, the guy who's going to lead that
3 is standing in front of you -- or would be if I wasn't
4 actually retiring quite soon, so my successor will be
5 doing it. But yeah, I mean we've been watching that
6 one coming and we will undoubtedly need to have fairly
7 extensive dialogue.

8 One of the things that we don't do is rush to judgment,
9 particularly in a bipartite structure, it is necessary
10 for the scientific impact of something as important as
11 that to resonate 'round the scientific community and
12 also 'round the trades union and employer communities
13 for a little while before we draw all the strands in
14 and come to some kind of view. I was also actually
15 involved in the BEIR V reassessment, and that took
16 about a year and a half to two years to settle down.

17 **DR. ZIEMER:** Wanda Munn.

18 **MS. MUNN:** I can't over-emphasize how marvelous it is
19 to hear the experience from UK and see the similarities
20 and be painfully aware of the differences in your
21 situation and what we're dealing with here. I have
22 some curiosity as to whether or not your experience

1 with your equivalent of our Department of Energy, which
2 appears to be only about ten years in length as opposed
3 to the entire Scheme, whether you have found that your
4 experience with that particular work force is different
5 than your experience with the broader commercial work
6 force.

7 **DR. SLOVAK:** I'll turn to John to give the first answer
8 to that. My views may be slightly more trenchant than
9 his.

10 **MR. BILLARD:** Most of the workers in the UK nuclear
11 industry once upon a time worked for the public sector,
12 but we have had an extensive privatization program over
13 the last ten, 15, now nearly 20 years. And it's been a
14 matter for the unions to make sure that terms and
15 conditions transfer, and therefore we primarily made it
16 an objective for private sector employers coming into
17 the industry that they would join the Scheme or be part
18 of the Scheme. And I'm very pleased to say that so
19 far, in respect of new employers coming into the
20 industry, taking on existing workers, we have not yet
21 had a refusal. And I think that is -- that is a credit
22 to the way the Scheme operates, based on science, based

1 on knowledge.

2 I think there's a point you should note, and that is we
3 never close a case. We might tell a claimant that
4 they're unsuccessful, but their file doesn't go in the
5 bin. In the event that there is a development in
6 medical or scientific knowledge, the case would
7 reopened if there's a chance of a settlement. All
8 these factors lead to a confidence level which has
9 meant that as far as the union side is concerned, there
10 is no difference in approach between employers, whether
11 they're in the public sector or the private sector, and
12 we're very pleased about that.

13 **DR. SLOVAK:** Does that fully answer the question?

14 **MS. MUNN:** That's fine.

15 **DR. ANDRADE:** It was amusing to hear your remarks
16 regarding our Special Exposure Cohort provisions, but
17 I'm curious. Given the fact that you need to have
18 bioassay or dosimetry records to follow up on a
19 particular case for the Scheme, what would happen if,
20 for example, there was a criticality event, there was
21 no criticality dosimetry involved, but yet there were
22 several witnesses to the -- to the fact?

1 **MR. LEWIS:** In that case we would look towards the
2 employer's technical people to make some assessment of
3 the potential doses to individuals involved in an
4 incident like that. And that would be placed on record
5 within the Scheme. Such a paper, and any paper that's
6 produced regarding technical issues like that is, in
7 the first place, discussed by the Technical Working
8 Party, but it has to be endorsed by the appropriate
9 Management Board. So whether it was to do with a
10 criticality, whether it was to do with, for instance,
11 an emission in the radiation monitoring regime over the
12 years, it would effectiv-- within the Scheme be a
13 transparent process and, you know, would require the
14 endorsement of all parties.

15 That is one thing -- I think one thing we didn't
16 mention in the presentations is that our Scheme runs by
17 consensus. Within the individual meetings there's no
18 vote and there's no bloc voting. Everything is agreed
19 through the Chair by consensus by all parties. And
20 certainly, given that my job is to run the Scheme
21 independently and on behalf of the interested parties,
22 it makes my job a lot easier that the decisions are

1 made that way. Is that -- is that okay?

2 **DR. ANDRADE:** Yes, thank you.

3 **MR. GRIFFON:** Along -- along a similar path as Tony's
4 question, I'm just curious how your dose reconstruction
5 process is similar or dissimilar to the one that we've
6 outlined for this program and -- and along with that,
7 I'm wondering if you involved -- you did any sort of
8 interviewing of claimants and used that as part of your
9 -- your registration efforts.

10 **MR. LEWIS:** No, we -- we don't interview claimants,
11 except in the event that claimants raise certain
12 specific issues, either at the outset of the claim or
13 when the screening data is issued to them by the union.

14 In which case we're talking -- out of 1,000 cases,
15 we're talking less than a dozen cases where, you know,
16 we have arranged meetings with the claimants, a union
17 representative and technical representatives from the
18 employers to discuss those concerns to identify whether
19 in fact those concerns would lead to the assessment of
20 doses additional to those already taken into account by
21 the dose record. And if so, the employer's technical
22 people would then -- as I mentioned to Antonio, the

1 employer's technical people would then do whatever dose
2 reconstruction was necessary, and that would be
3 channeled through the Technical Working Party and
4 eventually agreed by both unions and employers and
5 applied to the case.

6 **MR. ELLIOTT:** You used a term, Mike, that struck me as
7 another difference between our two -- the Program and
8 the Scheme, and that is transparency within the Scheme.

9 Here in the States, our transparency is effected
10 through these public meetings and the oversight, the
11 consensus advice generated from this advisory body. Do
12 you see that as being an issue as a difference between
13 us, the Program and the Scheme?

14 **MR. LEWIS:** No, I think that's more of a cultural
15 difference between the UK and the USA. I mean the way
16 we consider democracy in the UK is that democracy is
17 channeled into democratically-elected bodies or groups
18 who then are empowered to act in whatever way they see
19 fit under their (inaudible). And I think within the --
20 the way that works in the Scheme is that the union is a
21 democratically-elected and constituted body and they
22 represent the claimants who, you know, have a

1 democratic process within the unions, but the unions
2 are the representatives within the Scheme.

3 Now whether it's because our scheme was conceived 20
4 years ago and 20 years ago you didn't have publicly-
5 held meetings like this, I don't know. I mean whether
6 that -- whether that is something that would change in
7 the future, again, I don't know. But certainly for the
8 moment, you know, we -- the -- all parties are
9 represented, either through the employer
10 representatives or the union representatives, and
11 that's the way the democracy works within the Scheme.

12 **DR. SLOVAK:** Yeah, I'd like to just add something to
13 that. We -- the Scheme is over 20 years old and it
14 retains a high level of trust, and it sort of builds up
15 its own steam of trust, if you like. One of the areas
16 in which certainly the UK and much of Europe is lagging
17 is in the provision of public information and public
18 exposure of these issues to a broader set of
19 constituencies.

20 Now under the Nuclear Installations Act, there are such
21 bodies, and those issues can be raised in those bodies,
22 and the nuclear ones are called Local Liaison

1 Committees. So you can have these discussions.

2 By and large, our experience is that these issues have
3 not been brought up, but I don't know whether that's an
4 expression of confidence or whether they've got more
5 important things to do. But we can do it, and so in
6 fact there is actually not as much difference as you
7 would think.

8 **DR. ZIEMER:** Thank you. Roy?

9 **DR. DEHART:** As an extension of that issue, has it been
10 necessary for the Technical Working Party to use any
11 external quality assurance measures or assessments?

12 **DR. SLOVAK:** We've never done so. We would be
13 perfectly happy to do so, should either party take a
14 view on any particular issue. I mean it's that
15 flexible if either -- I mean our essential purpose is
16 to obtain a consensual position. But if we had an area
17 of disagreement or if there was a party which felt that
18 it would be useful to do that, then we could
19 accommodate that simply by saying well, that's what
20 we're going to do from now on or that's what we're
21 going to do for this particular issue because it seems
22 desirable.

1 **DR. ZIEMER:** No further questions or comments? One
2 more here.

3 **MR. ELLIOTT:** I'd just like to thank you all three for
4 coming to the States and spending time with us this
5 week. They will be in Cincinnati with us for the
6 remainder of the week, and we'll be having some of
7 these technical discussions, but we certainly
8 appreciate your presence here today and your very valid
9 comments to this Board. Thank you.

10 **DR. ZIEMER:** Yes, indeed, it's been very helpful. Is
11 there -- the Department of Labor representative also
12 has a comment here.

13 **MR. HALLMARK:** Sorry to drag this out, but since we
14 have this opportunity, it's wonderful to hear and I
15 second the thanks from the Board for your presentation
16 to hear about people who've been doing this for 20
17 years as we struggle to get started. But I had a
18 couple of questions I wanted to ask. One is, you
19 mentioned the SEC and your not having an SEC, but you
20 did have something called a Special Factors Panel,
21 expert panel that you elaborated that addresses itself
22 apparently to specifically difficult cases. And I

1 wondered since you had such a seemingly successful
2 strategy for resolving disputes among the parties, why
3 you would need this further group to resolve the really
4 difficult disputes. That's one question.

5 **DR. SLOVAK:** All right. Well, we'll both try and
6 answer that. The Expert Panel was set up at the
7 inception of the Scheme, partly I think because of the
8 reasons that have been expressed by several questioners
9 about trustworthiness and reliability and external peer
10 review. What has actually happened within the Scheme
11 is that the role of the Expert Panel has actually been
12 narrowed as we've gained experience with operating the
13 program. It's still very useful to have them because
14 we do get the occasional tough one, and it's a good
15 idea -- maybe this is sort of the underlying purpose of
16 your question, really, is it is useful to get a second
17 opinion on some of these things. Also, because they're
18 extremely distinguished scientists, they will raise
19 issues and feed them back into us where they don't
20 think that we're quite clear about we're doing. We've
21 certainly brought things back into the technical
22 structure in order to do that.

1 **MR. LEWIS:** Just to reiterate on what Andy was saying,
2 really I think the Panel -- I personally would view as
3 a representation of the strength of the Scheme rather
4 than a weakness. We recognize that in constructing our
5 schedules there are some small areas where particular
6 features of particular cases might mean that the answer
7 you would get from using the dose risk relationships
8 presented by the schedules may not answer all questions
9 for all cases. So the Panel really exists, in the way
10 they work at the present time, to consider more deeply
11 those cases where the schedules don't give you a
12 particularly reliable answer for all sets of
13 circumstances.

14 **DR. ZIEMER:** Did you have an additional question?

15 **MR. HALLMARK:** I had one last question, which is I
16 heard I think Andy indicate that he had an assessment
17 of the success rate being experienced so far, other
18 than in the SEC, here in the United States. I'm not
19 sure that that's really a mature number. And I guess
20 this is more a comment than a question. I'm not sure
21 you're able at this point to take -- make much of a
22 sensible judgment about how the success will flow from

1 the NIOSH process, and I guess the question that's
2 imbedded here is what impact will that have on the
3 confidence issue you're raising in the UK if in fact
4 the success rate is higher through the NIOSH process?

5 **DR. SLOVAK:** It was John actually who said that. And
6 it was the state where I was going to nudge him a
7 little bit and say well, that was very kind of him to
8 say so and we'll watch your experience with some
9 interest. I think that's the polite way of putting it.
10 Quite clearly we would be quite concerned if large
11 differences began to appear. It would put an enormous
12 amount of pressure -- I suspect more on our trade
13 unions than ourselves, which is why he's here and John
14 may want to add to this -- to seek a review of the
15 whole process. But, you know, we will see. And if
16 there is any problem -- if in the intercomparisons
17 there are problems, we will have to address them.

18 **MR. BILLARD:** I simply endorse those remarks. We've
19 run our Scheme pretty successfully over the last 20
20 years, but we're certain to have things to learn in the
21 future. And in the same way that science and medicine
22 is developing in the treatment of cases, I think

1 jointly we're likely to experience such future changes,
2 which I'm sure will be beneficial. But if -- if -- we
3 have about a ten percent success rate, you see, and
4 that's been pretty consistent over the past 20 years.
5 And if you're coming -- if, as time goes by, you start
6 to come up with something which is, you know,
7 reasonably significantly different to that, we are not
8 going to get science and medicine to defend us. We're
9 going to have to start to get some political elements
10 coming in, which we will have to deal with. But I
11 think time will tell. But I think, having heard what
12 we've heard so far about the US DoE program, we're
13 reasonably confident that we won't have these
14 difficulties, but we'll see.

15 **MR. LEWIS:** If I could just add one thing, I think it
16 would also go to how the dose profile of your potential
17 claimant population compares to ours. Certainly within
18 our Scheme there are quite striking differences between
19 each of the employers. For instance, if you compare
20 some of the BNFL claimants who worked in some of the
21 reprocessing buildings in the fifties, sixties and the
22 early parts of the seventies, the sorts of doses

1 they've received over their working lifetime are vastly
2 higher than somebody who spent 30 years working on an
3 AGR power station. And whilst you could make the
4 general comment about success rate, I think you would
5 have to understand, you know, what the underlying dose
6 profile you were dealing with between the two
7 industries was. I mean I would guess that there would
8 be areas where there's a great deal of comparison, but
9 there may also be a few areas where you might have
10 experienced a particularly high rate of claimant
11 success where, you know, there may not be such striking
12 comparisons with the UK nuclear industry.

13 **DR. ZIEMER:** Thank you very much. This has been very
14 helpful and I'm sure we'll both be looking at each
15 other as the years progress here, but we do, again,
16 appreciate your time, sharing with us not only today
17 but with the NIOSH staff the rest of the week, so thank
18 you very much.

19 **MR. LEWIS:** You're welcome.

20 **WORKING GROUP REPORT**

21 **DOSE RECONSTRUCTION REVIEW PROCESS**

22 **DR. ZIEMER:** We're going to proceed to a report of the

1 dose reconstruction work group. Mark Griffon is going
2 to give us that report. Also I'd point out that we
3 have another part of our agenda devoted to this topic
4 so that even though it may look like we're
5 shortchanging it a little bit here, we do want to break
6 at noon. But Mark, you understand that we do have
7 additional time tomorrow so that if you're unable to
8 complete all your -- in fact I think you probably will
9 not complete everything 'cause you may have some
10 additional things under preparation that will come to
11 us tomorrow.

12 And Mark, if you would, when you begin your report,
13 also include a brief summary of the meeting with the
14 potential contractors that was held in Cincinnati in --
15 earlier this month, actually.

16 Board members, let me point out that you should have
17 received recently in the mail a summary of the meeting
18 of the work group in Cincinnati, a summary of that
19 meeting with the potential contractors. What did we
20 call that meeting, the --

21 **MR. ELLIOTT:** Pre-Bidder's Conference.

22 **DR. ZIEMER:** -- Pre-Bidder's Conference. If you did

1 not receive that summary, please let Cori know, but it
2 was not exactly a set of minutes, but it was a summary
3 of what was done.

4 And Mark, if you can recall also who attended that
5 conference on behalf of the Board --

6 **MR. GRIFFON:** I will --

7 **DR. ZIEMER:** -- if you'll --

8 **MR. GRIFFON:** -- try, yeah --

9 **DR. ZIEMER:** -- share that, too.

10 **MR. GRIFFON:** -- if I miss someone, you can fill in.

11 Let me just start -- this is a -- boy, I can't even see
12 my own overheads. This is a -- I wanted to give a
13 little background for those in the audience that
14 haven't been following our working group work. This
15 working group has been established to look at how the
16 Board -- the Board's role in reviewing the dose
17 reconstruction activities that NIOSH is conducting, and
18 the Board is required by statute to review the
19 scientific validity and quality of NIOSH -- of NIOSH's
20 dose estimation and dose reconstruction efforts. And
21 what -- so far our work -- where we've gone with this
22 work is that we're going to look at individual dose

1 reconstruction reviews, we're going to look at site
2 profile and worker profile reviews, petition -- Special
3 Exposure Cohort petition reviews, as well as a review
4 of the procedures used by the -- by NIOSH.

5 And to complete this effort, the Board has determined
6 and NIOSH is helping to hire a contractor to assist the
7 Board in doing these reviews. We -- the working group,
8 along with the entire Board, assisted in the
9 development of the actual task order contract, and it
10 was recently published. NIOSH -- as Paul just
11 indicated, NIOSH recently had a pre-bidder meeting
12 where we entertained questions and the working group --
13 some of the working group members were present. Let me
14 -- let me -- I -- Paul was there, myself, Tony Andrade,
15 Rich Espinosa and -- was that it? I think -- and Bob,
16 I'm sorry. Bob Presley was there, yeah. And we -- we
17 entertained questions from potential bidders at that
18 meeting. And I think where that stands, and I'll have
19 a schedule at the end of this presentation, but the
20 bids are due June 2nd, and we're hoping to get all this
21 on line by this -- by the early September time frame of
22 this year so that we can have a contractor in place

1 that will assist the Board in reviewing all this stuff
2 and reviewing dose reconstructions. So that's just a
3 little bit of background.

4 The working group, as a -- let's see, you can see --
5 you can see I'm very prepared for this. I can't see my
6 own overheads so I don't know where I'm going with this
7 presentation.

8 The working group's tasks -- let me just -- yeah, let
9 me put that on.

10 (Pause)

11 How's that?

12 **UNIDENTIFIED:** That's good.

13 **MR. GRIFFON:** Is that all right?

14 **UNIDENTIFIED:** Yes.

15 **MR. GRIFFON:** All right. The working group tasks --
16 and some of these overheads will show up from last
17 meeting's efforts, but I've filled in some gaps on
18 them. We're -- are now in the process of looking at --
19 developing draft procedures for the review process,
20 developing procedures for case selection, and develop
21 the individual task orders. So we have the task order
22 contract, and out of that we have to develop individual

1 task orders for certain tasks that we are going to ask
2 the contractor to do.

3 As part of our effort, we went to ORAU. I did a little
4 follow-up visit to NIOSH after the pre-bidder meeting
5 where we looked at the database that NIOSH has set up,
6 and we -- we just wanted to get a sense of what the
7 files look like. What does a completed dose
8 reconstruction look like, what does the administrative
9 record look like, what kind of files can we expect to
10 be in this review, what kind of records are in this
11 review. We tried to walk through our draft procedures
12 for the basic and the advanced review against some of
13 the -- a couple of these example cases, these completed
14 dose reconstructions.

15 We -- so far what we've done, we've developed the basic
16 and advanced case reviews, and we focused on individual
17 case report forms. We actually have drafted two of
18 those. Since I was tardy in getting my handouts to the
19 Committee, we don't have copies right now. But
20 essentially these -- these forms sort of track the task
21 orders themselves and look at the data-gathering
22 elements, the interview process and the actual dose

1 estimation process, those three elements that are
2 outlined in the task order contract which -- I don't
3 know if we have handouts of that stuff here today, but
4 -- which we've looked at before.

5 The summary report form, the difference here is that we
6 -- we envision the contractor will assist in -- or will
7 write up a report for each individual review, but also
8 will write a summary of a group of cases that they
9 might have done, and that will be a presentation. So
10 that'll be more of an executive summary type of format
11 where they look at sort of aggregate findings from a
12 group of cases, and that's the sort of presentation we
13 envision back to the Board to all Board members.

14 On this first part, the individual case review, we --
15 in the working group we keep reminding ourselves that
16 this whole process is the responsibility of the Board.

17 And we have talked about before, and I'll bring it up
18 again, the fact that the Board members will be involved
19 with the contractor. And we've envisioned different
20 schemes on this which I think we have to nail down
21 fairly shortly, hopefully at this meeting, of how the
22 Board members might rotate in and work with contractor

1 staff. So you might have a group of ten cases and two
2 Board members are assigned to work with the contractor
3 for those ten cases, so they would -- they would get --
4 those two Board members would be more engaged on the
5 details of that review. The rest of the Board would
6 certainly get the sort of executive summary of those
7 reviews but wouldn't have to be involved in -- in all
8 the details of those cases, sort of -- that's partially
9 an attempt to space the work out, but also partially an
10 attempt to make sure the Board is not just totally
11 relying on the contractor but is involved in the
12 process, as well.

13 The last item is the Board report form, which would be
14 the report that the Board would then forward to Health
15 and Human Services.

16 This -- as we did -- as we drafted these procedures,
17 one thing that strikes me in this review is the -- as I
18 said, they're direct from the task -- task order
19 contracts, and if you have that language in front you,
20 you'll notice that some elements are fairly subjective,
21 such as the one I noted here, that -- this is -- is
22 much -- a lot of judgment or subjective input has to be

1 given consideration in this review. Other items are
2 very prescriptive, you know. We -- I think we have one
3 item that says did NIOSH receive all the data requested
4 from DOE. Well, that's a fairly prescriptive element.

5 But there's others that are fairly subjective and are
6 going to require a lot more input and elaboration
7 probably by the contractor in the report. It won't
8 just be a simple yes or no response to some of these
9 items.

10 We also -- another thing that came from the discussions
11 on these two report forms was the question of the
12 individual case versus the summary findings. And I
13 think we talked about the prim-- one primary purpose of
14 this effort is to get a sense, program-wide, if there's
15 -- if there's problems that are leading to across-the-
16 board problems in the program, if we can get a sense of
17 that in the summary findings more. But I think we also
18 have a question of if an individual case -- if the
19 contractor -- actually the Board makes a determination
20 that there was some errors in the case that would
21 result in a change in the outcome, it might push it
22 over the 50 percentile mark, then we have -- that's a

1 question we have. You know, what if -- what if we run
2 into those kind of situations, what -- how do we --
3 what recommendations do we make to NIOSH, how do we
4 handle that procedurally. So those -- those issues
5 came up when we were walking these through.

6 Then -- this is another thing, and I -- this morning
7 our working group just met real quickly to go over some
8 of these things, and I -- I don't know why I did this,
9 but I volunteered us for a couple of things in the next
10 two days which I think we can really hammer out while
11 we're all here. One of them is this process, so I'll
12 volunteer the working group to take a stab at a first
13 draft of this. We -- and certainly this afternoon we
14 can discuss it more to get it all out on the table.
15 The process of how, you know, when we -- we select a
16 case, the case then -- well, even to the point of, you
17 know, the administrative record is put on a CD maybe
18 for distribution to the contractor. Can the -- can the
19 Board members also get that CD. There's some Privacy
20 Act questions there.

21 Once the contractor reviews, then how do we assign
22 Board members to work with the contractors on certain

1 cases, when do we meet -- how do we coordinate the
2 meetings. We talked about coordinating them such that
3 they could be held prior to Board -- prior to Board
4 meetings so we wouldn't have to travel too frequently.

5 And then right down to the presentation of the final
6 report from the designated Board members with the
7 contractor back to the full Board, how would that be
8 handled. So we -- we want to -- to sort of spell that
9 out in a procedure format and then have a draft for the
10 Board so that we can sort of tear it apart and mark it
11 up and make -- make something that's going to be
12 workable for all of us. So that is -- that is
13 hopefully on our agenda for tonight.

14 The case selection process -- this is one thing that --
15 that we did work on at NIOSH by -- by looking the
16 database and with some help from Dick Toohey, who
17 actually gave me some statistical data on -- at least
18 as it exists on the day we were out there, some 12,800
19 cases I think were there. We -- we got a sense of a
20 cross-section of cases by site, by other demographics.
21 And we -- previously we've talked about the 2. --
22 sampling approximately 2.5 percent of all the cases and

1 establishing a matrix of the selection criteria so that
2 we would sort of do it and -- we're not completely --
3 I'm not completely sure in my mind how this is going to
4 work because the number of com-- we're only going to
5 look at reviewing completed cases, so the number of
6 completed cases keeps growing, so I'm not sure how
7 we're sampling that pool to fill in our matrix as the -
8 - as the sample pool is growing. But we can -- we can
9 work that out, I'm sure.

10 But the idea then is to -- based on the cases sampled -
11 - fit them into a matrix of parameters that we've
12 outlined, and I have those on another spreadsheet if
13 you want to pull those up, some that the working group
14 has considered, at least.

15 This is probably very hard to see in the back, I'm
16 sure. Can you slide it over, Jim? Sorry. There, just
17 slide over to field A, yeah. Right over here where you
18 were.

19 (Pause)

20 **DR. ZIEMER:** Just go to the right a little bit --
21 there.

22 **MR. GRIFFON:** There. Not a big fan of Excel, huh? No.

1 The tracking -- I just labeled this tracking ma-- this
2 is very draft, very preliminary, but we -- we had some
3 -- some data that we thought was worth using. The site
4 group on the left-hand side and I put site/group. If
5 you'll notice on the -- we sorted -- I had a -- a sort
6 of these by the number of claims, again, a snapshot in
7 time. And the highest to lowest basically is on the
8 left-hand side. That count, if you look, is actually
9 the number of claims times 2.5 percent, so that'll give
10 the number that we would sample. You know, that we
11 want to meet -- that we want to get out of Savannah
12 River site.

13 As we go down, on the bottom -- the very bottom of
14 number 29 you can see industry groups. The question
15 is, when you get to a point where you have less than --
16 the number of claims at an individual site are less
17 than one percent or -- say one percent of the entire
18 claims available, you really can't sample two or three
19 percent of that, you know, group. It -- there's not
20 many cases there to sample. So we thought about
21 grouping those and hopefully -- with NIOSH's help,
22 grouping those by like industries. I think there's

1 several of those AEC sites that can probably be grouped
2 by similar types of industries -- uranium processing or
3 that sort of thing. So then from those industry
4 groups, we would sample a total number of 47 out of
5 those -- all those other groups --

6 **DR. ZIEMER:** Mark, clarify column E, what is column E?

7 **MR. GRIFFON:** Column E -- okay, column E -- all right,
8 so -- so over here -- there's -- there's several
9 different criteria here that -- we've got -- different
10 parameters that we want to fill this matrix in on. One
11 is the site, right, or location. The other is cancer -
12 - cancer type, and cancer type, this is a percentage of
13 --

14 **DR. ZIEMER:** Well, take oral cavity and pharynx, that -
15 -

16 **MR. GRIFFON:** Right, if you --

17 **DR. ZIEMER:** Go back to column B. Does that say there
18 were 37 of those at the Savannah River site?

19 **MR. GRIFFON:** No, it says that there were -- there were
20 -- 2.4 percent of all -- of the overall cases or eight
21 would be the number we'd want to sample.

22 **DR. ZIEMER:** Oh. What is the 37?

1 **MR. GRIFFON:** Thirty-seven, they -- there -- there's
2 sort of -- I didn't put divid-- fancy dividers, but
3 this goes with this parameter and this next two are
4 with cancer.

5 **DR. ZIEMER:** Oh, I --

6 **MR. GRIFFON:** I should have -- I should have --

7 **DR. ZIEMER:** So 37 SRS cases --

8 **MR. GRIFFON:** Right.

9 **DR. ZIEMER:** Okay, I'm -- those don't go together then.

10 **MR. GRIFFON:** We can format this a little better, yeah.

11 **DR. ZIEMER:** Gotcha, gotcha, okay.

12 **MR. GRIFFON:** It's in very raw, user form here. So the
13 parameters mainly to look at are the site, the cancer
14 type, job group, the decade first employed, and you'll
15 notice on the decade first employed -- or maybe you
16 won't notice -- the decade first employed, we had
17 forties, fifties, sixties, seventies, eighties. We
18 certainly weighted the sampling -- or we propose
19 weighting the sampling of that toward the earlier years
20 because we think that's -- that's when more of the --
21 more of the issues as far as dose reconstruction would
22 be found.

1 Then the primary radiation type, you have external,
2 gamma, neutron, beta and also internal, and I just
3 listed some I -- this is not sup-- intended to be
4 extensive at this point, but I think we -- the notion
5 is that we'd want to at least see some cases where you
6 did plutonium reconstructions, some internal dose
7 plutonium reconstructions, obviously. That's an easy
8 one. But how many and the breakout of that, I don't
9 have right now.

10 The final column, which you can't quite see, is the
11 outcome. Outcome is, you know, either approved or
12 denied, and we talked about weighting the sampling of
13 those by less of the approved cases to be reviewed and
14 more -- you know, more weighted toward the denied
15 cases, 80 percent on the denied side. So again, the
16 idea is that you sample randomly from an existing pool
17 and say I pull out a case and it's a Savannah River
18 case, it -- it's a supervisor first employed in the
19 fifties, a primary exposure was of plutonium and it was
20 a denied case, so you sort of fill in your checks as
21 you go along and until we meet these numbers,
22 basically, and that's the sort of initial proposal of

1 how we will work this tracking.

2 There may be some parameters that -- we had a laundry
3 list of parameters I think that we started with. These
4 are the primary ones I think that kept coming up.
5 Certainly if I missed something, that's something for
6 dialogue. But that's where we are on that and --

7 (Pause)

8 The other element which I volunteered my -- my team
9 members for this morning was that we want to develop
10 the task orders, and -- and we -- we feel this -- we
11 wanted to have these in the hopper by the time the
12 contract is awarded -- contract or contracts, I should say,
13 are awarded in early September. We want to have these
14 task orders ready to say okay, here, you know, give us
15 an estimate on these and let's get the ball rolling.
16 So the idea -- we think fairly easily that we can at
17 least get a draft of a basic review, advanced review
18 and a procedures review because after eight versions of
19 the primary contract and going through all that
20 language many times, I think we've -- we've got some --
21 some language that we're all pretty happy with, and
22 it's fairly specific so we think we can pull a lot of

1 that from those sections of the original task order
2 contract to develop these task orders. And we're going
3 to try to draft some of that this evening, too.

4 The only question I -- or request I would have is from
5 -- laughing at me. The only question I would have from
6 NIOSH on that is -- is if we need certain formatting
7 for those contracts, we'd look to assistance from them
8 on that.

9 And then -- then we have some discussion items that
10 have come up through our -- our meetings in Oak Ridge,
11 through our various discussions on these procedures,
12 and I think these would be good items for this
13 afternoon's agenda when we have further discussions on
14 this. One -- one question is the Board and contractor
15 access to data, and when I say that, I mean to NIOSH
16 data and also to other records or reports which may be
17 DOE or AEC records. The question I brought up earlier
18 about the NIOSH data was -- Larry can probably expand
19 on this a little more, but there is a question of how
20 we -- how we are going to be able to deliver the
21 administrative record for a certain case file to either
22 the contractor or -- or I guess more problematic might

1 be the Board members that are involved in that review.
2 Also the question there, which I don't think any of
3 these are unworkable, but the question -- other
4 questions are the site profiles or worker profiles. If
5 the contractor's working remotely, they won't be on
6 line on NIOSH's system where they can quickly go to all
7 those documents, so how are we going to -- if they need
8 these other documents -- or procedures or tech basis
9 documents -- how are they to be provided.

10 And then on the bottom, the Board and -- and/or
11 contractor access to site personnel and/or NIOSH/ORAU
12 staff. I think there might be instances where the
13 review contractor, along with Board members, may want
14 to turn to a technical expert, a health physicist from
15 the particular site or a retired health physicist from
16 a particular site that might have even been noted in
17 the administrative record. We just question whether
18 that can be done or how that can be done, whether that
19 has to be done through NIOSH to that individual or --
20 you know, how that might work was another question that
21 came up.

22 A couple more items. Also a big issue that we've -- we

1 batted around earlier in developing this task order
2 contract was the Board and contractor access to
3 claimants for follow-up, and whether we can -- whether
4 we can basically re-interview or -- or follow up on
5 their interview. There -- as we know, there are no
6 transcripts from these interviews so there's no record
7 there to review. We did table this issue so that we
8 could get the contract out, but I think we as a Board
9 have to take that up again and see if we -- where we
10 want to go with that.

11 And then I think I already -- I already said a piece on
12 this, the individual versus the summary reviews and the
13 question of whether it would change an outcome.

14 And I think -- yeah, the last thing is the schedule,
15 and if I got any of this wrong, Larry, you -- or Jim,
16 you can correct me. We did have the bidder meeting on
17 April 30th. Work group completes draft task orders --
18 you notice there's no date there yet; we're working on
19 it. Final proposals due June 2nd, and then there's
20 going to be a technical review which should be
21 completed by the end of June, contract award early July
22 and task orders awarded by early September. Is that

1 accurate? So that's what we're pushing for and that's
2 part of the reason we want to push to develop these
3 task orders soon and maybe get a draft here so that we
4 can get a final one at our next Board meeting.

5 **DR. ZIEMER:** This is a good point now to -- to recess.

6 We will pick up discussion on this and have a chance
7 for additional questions after lunch, about mid-
8 afternoon.

9 Some information relating to lunch, Cori has menus from
10 various eating establishments in the area. I think
11 also -- at least I have -- I guess I got here a menu
12 from this hotel, but all of these things -- Cori, are
13 they back there? I believe there's a lot of eating
14 places around close by.

15 **MS. HOMER:** The only information I have is from this
16 hotel.

17 **DR. ZIEMER:** Oh, we have information only from this
18 hotel. Okay, but there are other eating establishments
19 around the area.

20 So we're recessed until 1:30.

21 (Whereupon, a luncheon recess was taken.)

1 like to read it to everyone.

2 This certificate is presented in recognition and
3 appreciation for service on the Advisory Board on
4 Radiation and Worker Health of the Centers for Disease
5 Control and Prevention as a member, signed Julie Louise
6 Gerberding.

7 So it's my pleasure to present this to you.

8 **MS. GADOLA:** Thank you very much.

9 (Applause)

10 **MS. GADOLA:** It has really been a great honor and a
11 privilege to serve on this Board, this very
12 distinguished Board. I've met some terrific people.
13 The expertise here is just overwhelming, but especially
14 I am touched by the workers and their families and
15 those that have spoken to us, and it just keeps
16 reminding us what an important job this is. And I know
17 how hard NIOSH has fought to make this as fair as
18 possible. And I would just encourage all of you to
19 continue your hard work, and thank you again for
20 letting me serve you.

21 (Applause)

22 **FUTURE CONSIDERATION OF UNCERTAINTY IN IREP**

1 **DR. ZIEMER:** We'll return now to the regular agenda.
2 We're pleased to continue with some information on
3 IREP, particularly focusing on uncertainty issues, and
4 then a little refresher on IREP, so we have with us
5 Owen Hoffman. Dr. Hoffman's been with us before.
6 We're glad to have him back with us again, and Owen is
7 going to kick it off with this discussion on
8 uncertainty in IREP.

9 Let me just mention, and I realize now -- I didn't know
10 this morning -- that many of these biographical
11 sketches are on the table back there, but I'll give a
12 couple of abbreviated sentences, Owen, to save you as
13 much time as possible.

14 But Dr. Hoffman basically got his doctorate in ecology
15 at the University of Tennessee, and he currently is
16 president and director of SENES Oak Ridge,
17 Incorporated, Center for Risk Analysis. Dr. Hoffman's
18 had several decades of experience in evaluation of
19 risks to humans from the release and transport of toxic
20 materials, particularly chemicals, radionuclides in
21 terrestrial and aquatic systems. So he's also active
22 in many professional areas. He's a member of the

1 National Council on Radiation Protection and
2 Measurements, the so-called NCRP, and he's also a
3 corresponding member of the International Commission on
4 Radiological Protection. Owen, we're pleased to have
5 you back with us today.

6 **DR. HOFFMAN:** And I'm pleased to be here in front of
7 you and also would like to personally welcome you to
8 our hometown of Oak Ridge.

9 The topic is future considerations of uncertainty in
10 IREP, and for those of you out there that don't know
11 what IREP means, it's the Interactive
12 RadioEpidemiological Program, actually developed right
13 here in Oak Ridge. And when you go on line to test
14 drive it, it's actually being driven from servers
15 within our Oak Ridge office.

16 The methodology used to quantify uncertainty in IREP is
17 -- maybe I'll try this thing 'cause I don't like the
18 sound of my voice coming in and out. Is this on now?
19 Yes.

20 The methodology in IREP was actually derived from the
21 same methodology that we employed from 1965 -- from
22 1995 to 1998 in the Oak Ridge dose reconstruction. So

1 for those of you who followed the work that we did here
2 in the Oak Ridge health studies, it's the basic
3 methodology that's now being used in the Interactive
4 RadioEpidemiological Program. And one major area where
5 this program differs from the scheme being applied in
6 Great Britain is full -- the full disclosure of
7 uncertainty in a quantitative manner.

8 Now the uncertainty in IREP is meant to reflect our
9 current state of knowledge. That means when knowledge
10 improves, the uncertainty should be updated. What I'm
11 going to present here are areas where I feel IREP might
12 be updated in the near future.

13 In one case, I will point to an area -- namely lung
14 cancer and cigarette smoking -- where there are active
15 efforts by the National Cancer Institute to update it
16 based on new information that has come in from the
17 follow-up of the Japanese cohort.

18 Now the prime envisioned updates of course will be the
19 revised risk coefficients from the Japanese survivors.

20 As Gen mentioned, the dosimetry has now been
21 officially revised. The cancer data will shift from an
22 emphasis on mortality to an emphasis on incidence. We

1 would expect new data to emerge now within the next one
2 to two years, especially with the ongoing efforts
3 within BEIR VII of the National Academy of Sciences.
4 I would expect also improved statistical methods of
5 dose response analysis to occur, maybe even some
6 Bayesian* approaches, that would take information about
7 those organ sites for which we have lots of information
8 and applying that as a prior distribution to those
9 organ sites for which little information is needed.
10 Now within the worker community there has been concern
11 expressed that the sole basis for the risk estimates,
12 with the possible exception of radon and lung cancer
13 and radiation and thyroid cancer, the sole basis of
14 risk estimates has come from the Japanese cohort. But
15 yet there's many studies on worker cohorts that aren't
16 included in the IREP program. Perhaps in the near
17 future there may be some efforts that are undertaken to
18 combine datasets. I'm not saying replace the Japanese
19 survivor data with worker cohort data, but complement
20 the Japanese survivors data with worker data, perhaps
21 even giving subjective weights based on the strengths
22 and limitations of each of the studies. This could

1 occur.

2 Another area where I envision updates in the state of
3 knowledge to modify the uncertainty estimates in IREP
4 would be a re-evaluation of the assumptions used in
5 transferring risk between the Japanese cohort and your
6 U.S. populations. And the primary reason for this re-
7 evaluation is to look at the sensitivity of risk to
8 differences in the baseline cancer rates. And to what
9 extent these baseline cancer rates differ among workers
10 than among the general U.S. population, to what extent
11 the models used for transferring from one population to
12 another, are more likely to be either additive or
13 multiplicative rather than some hybrid.

14 Currently, with the exception of stomach and breast
15 cancer, we assume a lack of knowledge distribution that
16 spans the entire spectrum between sub-additive and
17 super-multiplicative, with very little weight given to
18 the possibility of strict additivity or multiplicative
19 relationship in the transfer from Japanese to the U.S.
20 population. I think a re-evaluation might conclude
21 that increased weights to either extremes might be
22 justified.

1 Now this slide I want to pass through, but I was told
2 we couldn't have hidden slides in the presentation, but
3 I'm going to effectively hide this slide because that
4 has been put into the presentation primarily to explain
5 additivity and multiplicative transfer models for those
6 who ask the question, but if you don't ask the
7 question, we don't need to discuss it. It's in your
8 handouts, however.

9 An area where I know that Richard Miller is especially
10 interested in changing assumptions within IREP has to
11 do with the assumption on the low dose and dose rate
12 effectiveness factor whereby standard assumptions are
13 that the risk due to chronic exposure to radiation at
14 low doses will be lower than the risks observed when a
15 cohort has been exposed at high doses to an acute
16 exposure situation. However, I think that recent data
17 on cohorts exposed to fractionated and chronic external
18 radiation and chronic exposure to internal emitters may
19 substantially update our current knowledge.

20 Now because of uncertainties in epidemiology and
21 uncertainties in dose reconstruction for those cohorts,
22 I think the distinctions that are within a factor of

1 two is going to be difficult to make, and therefore to
2 say that the low dose and dose rate factor is indeed
3 one or two, that's going to be different -- difficult
4 to make, but I think new mechanistic information from
5 recent low dose investigations with cellular and
6 complex biological systems might add some light to the
7 interpretation of these new epidemiological datasets.
8 What do I anticipate? Well, I anticipate that there
9 may be a reduction in the overall uncertainty
10 distribution that we currently have in IREP for the low
11 dose and dose rate effectiveness factor, and a possible
12 decrease in the central estimate, whereby every
13 decrease in the central estimate would bring about an
14 increased risk, and every increase in the risk per unit
15 dose would bring about an increase in the probability
16 of causation.

17 The next two slides are just there as examples to show
18 you the types of distributions for solid tumors, except
19 breast and thyroid cancer, and for -- the distribution
20 for breast and thyroid cancer currently in IREP. And
21 what I -- I'm away from the mike now, but basically
22 what I envision is some of the weight given to factors

1 down in this range may go down, some of the weight
2 given to factors in this range may go up (indicating).

3 Based on a re-evaluation of additional information
4 sets than we had available to us at the time, we put
5 the present version of IREP into place.

6 Now there's one area that I mentioned where there's
7 action underway already, right now, by the National
8 Cancer Institute to update what's in IREP, and this
9 deals with this -- the interrelationship between lung
10 cancer, radiation and smoking. The impetus for this
11 revision has come from a recent paper published this
12 year by Don Pierce and his colleagues at the Radiation
13 Research Foundation and the publication is in -- I
14 believe it's the March issue of 2003 in *Radiation*
15 *Research*. This paper indicates that the interaction
16 between radiation and smoking is most likely additive,
17 meaning that the probability of causation at the same
18 dose for a smoker will go down and the probability of
19 causation at the same dose for a non-smoker will go up
20 from what's in IREP.

21 There's less evidence for synergism between heavy
22 smoking and external radiation. What this means is you

1 look at the risk from radiation, it's simply added to
2 the risk from smoking, without there being a strong
3 interaction effect. At least that seems to be the case
4 for moderate and heavy smokers and somewhat arguable
5 for light smokers.

6 In the present version of IREP we have a very strong
7 difference between males and females. The new paper
8 suggests that this difference is small and in fact is
9 statistically insignificant.

10 In the current version of IREP there is no association
11 with age, either age at time of exposure or the age at
12 which the disease is diagnosed. The new paper by
13 Pierce suggests a very strong age at time of diagnosis
14 effect, and in fact this effect seems to be consistent
15 with what has been observed for other solid tumors
16 within the Japanese cohort. The paper includes a
17 caution, however, not to extrapolate the results of
18 this paper to the current assumptions to radon
19 exposure and lung cancer because the mechanisms of
20 action of small particles of the decay products of
21 radon depositing in the upper regions of the lung and
22 full uniform exposure to external radiation, these

1 mechanisms are inherently different.

2 Looking at this paper, I have come up with some
3 preliminary -- well, preliminary -- let me call them
4 not results, but preliminary implications of what
5 appears to be the overall effect, assuming that the
6 results from the Pierce paper are a more close -- a
7 more accurate representation of our current state of
8 knowledge. The implications to the current values in
9 IREP are as follows: the IREP estimates of probability
10 of causation are potentially underestimated for males
11 whose lung cancers were diagnosed before age of 50,
12 regardless of smoking history, and for females who were
13 light smokers. Probability of causation would be
14 underestimated for males who were light smokers and
15 their diseases were diagnosed between the age 60 and
16 70.

17 On the other hand, the IREP values of probability of
18 causation are potentially overestimated for non-smokers
19 who were diagnosed with lung cancer over the age of 50,
20 for moderate to heavy smokers with lung cancer
21 diagnosed after the age of 50, and for females who were
22 heavy smokers. And I'll show you some direct examples

1 of that, and these examples are also in your handouts.
2 The examples I'm going to show you are derived from the
3 estimates published by Pierce that are modified for the
4 effect of age at the time of diagnosis of disease,
5 smoking history and gender effects. And they're going
6 to be compared with the values that are in NIOSH-IREP
7 derived directly from the Japanese survivors prior to
8 being adjusted for transfer to the U.S. population, and
9 uncorrected and biased due to errors in the Japanese
10 dosimetry. Now the reason for this is to make the two
11 values as closely comparable as is possible. So for
12 those of you who have copies of the Pierce paper, you
13 will see that the values on this slide are identical to
14 the values in the paper, with just a couple of
15 exceptions.

16 The first is that the scale is logarithmic so that we
17 can see clearly what is happening with the smoking
18 effect. The confidence intervals have been increased
19 from one standard error to two standard errors, so that
20 we have a good representation of a 95 percent
21 confidence interval. In the following estimates these
22 values will be modified to account for the age at time

1 of diagnosis -- and let me just say, this is a big
2 effect, whereby early ages at time of diagnosis, such
3 as the age under 40, could be as much as six to seven
4 times higher than the risk associated with ages over 60
5 -- and in gender. Now gender in this case is a small
6 effect. It's about a factor of 1.3 upwards for
7 females, a factor of 1.3 downwards for males. And then
8 we will compare it with the values currently in NIOSH-
9 IREP.

10 So for example, the next slide shows the values for a
11 non-smoker male, these are males who have not smoked.
12 These are the values from Pierce, and so it shows a
13 strong age at diagnosis of disease effect whereby the
14 highest risks are for the youngest ages and the lowest
15 risks are for ages over 50, with the lowest being even
16 over 70.

17 Let's look at how NIOSH-IREP compares to this. Now it
18 takes your eyes a little bit to get adjusted to these
19 figures, but here's what you look for. If the
20 confidence bounds from Pierce go above the bands from
21 NIOSH-IREP, there is a chance then for NIOSH-IREP to
22 underestimate the results from Pierce. If the

1 confidence bounds from Pierce go below these bands,
2 then there is a chance for overestimation. So in this
3 case we have some chance of underestimation for the
4 early ages at time of diagnosis of disease for non-
5 smoking males, but a substantial chance for
6 overestimation at later ages.

7 And we'll go through each of the categories now for the
8 subsequent slides. For light males, we've seen -- for
9 light-smoking males, we see strong evidence for
10 potential underestimation of risk when lung cancers are
11 ascertained before the age of 50.

12 Next slide. For moderate smokers, there is a modest
13 chance for overestimation for the early ages at onset
14 of disease -- for underestimation in this area and for
15 overestimation for the older ages at onset of disease.

16 Next slide. For heavy smokers it's the same pattern.
17 And if you were to look at NIOSH-IREP you would find is
18 that the distinctions between moderate and heavy
19 smoking -- in fact, even light, moderate and heavy
20 smoking, the distinctions are minuscule in IREP. We
21 include those categories, but when you analyze the
22 differences in results, one would wonder why we even

1 bothered making the distinctions.

2 The distinctions are much larger in the new data from
3 Pierce. So here for heavy smokers we can see
4 substantial overestimation by NIOSH-IREP in the older
5 ages at time of ascertainment of disease, and a slight
6 chance for underestimation at the youngest ages of
7 ascertainment.

8 For females, in IREP, as I mentioned, we have very
9 large differences in risk as a function of gender.
10 This difference diminishes in the data by Pierce. For
11 females you'll see a large chance for overestimating
12 risk at older ages at time of diagnosis of disease for
13 females who didn't smoke.

14 Because of the way the multiplicative and additive
15 model interacts within IREP, the uncertainty in the
16 risk coefficients for the light-smoking female are
17 actually suppressed, but giving rise then to
18 substantial overestimation for the risks given for
19 those who have disease at older ages and substantial
20 underestimation for younger ages at time of
21 ascertainment of disease. A strong effect of
22 overestimation for the older ages at time of

1 ascertainment for moderate smoking females, and for
2 heavy smoking females the same effect, just slightly
3 more enhanced in the direction of the overestimation of
4 risk. And in this case it even includes overestimation
5 of the younger ages at the time of ascertainment of
6 disease.

7 Now this is a comparison between the data in the Pierce
8 study and the data now used in IREP. And the
9 indications are yes, indeed, there is an opportunity to
10 make adjustments, and I just would like to report that
11 Charles Land is in communication with Don Pierce at
12 RERF and he is -- well, in fact, he's made the decision
13 to hold up the publication of the NIH version of IREP
14 code until these updates are included. The updates may
15 or may not be consistent with the differences that I've
16 just shown you because there are many other
17 considerations that Charles is taking into account.
18 And in fact it does appear that he may even include an
19 age at time of exposure effect in addition to the age
20 at time of ascertainment.

21 Okay, that's one of the big areas where there could be
22 updates. What are some others? Well, radiation

1 effectiveness factor is certainly an area where
2 additional information could lead to enhancing our
3 state of knowledge, and that could lead to an update.

4 But that's the subject the David Kocher is going to
5 talk about after I'm finished here, so I'll let David
6 talk about that.

7 But by way of introduction, I want to alert you to our
8 own concerns about the weight of evidence for the
9 effectiveness of X-rays versus that of high energy
10 gammas.

11 Now what's the overall effect of future updates into
12 NIOSH-IREP? Well, as has been discussed many times
13 amongst yourselves and amongst us, placing a decision
14 criterion for eligibility of compensation claims at the
15 upper 99th percentile of the probability of causation
16 rewards for uncertainty. And if improved state of
17 knowledge decreases the uncertainty but has no effect
18 on the central estimate, fewer claims would be rewarded
19 -- or awarded, and therefore there is disincentive then
20 to engage in updating the IREP code to reflect an
21 improved state of knowledge, and this is unfortunate.
22 However, in updating our state of knowledge, additional

1 claims may become eligible if the central value of risk
2 increases as a result of modifications, or if the upper
3 range of uncertainty increases, and this would occur --
4 well, I would expect that to occur if we were to allow
5 other cohort datasets to be used to complement the
6 Japanese survivors in quantifying the original
7 epidemiological data for excess relative risk.

8 The problems occur when the -- when no change occurs in
9 the central estimate of risk, but uncertainty is
10 reduced due to the improved state of knowledge. And
11 those will be conditions in which it's going to be
12 administratively and even politically difficult to say
13 well, your friend who we had time to get to last year,
14 under the old version of IREP, he's compensated. But
15 unfortunately we have new information now and because
16 we didn't get to your claim until this year, we've
17 updated IREP and you're not eligible. But I'm sure
18 there -- I would imagine in those situations there
19 would be administrative decisions made so that we would
20 try to preserve the maximum amount of fairness in the
21 system.

22 I'm open to any questions.

1 **DR. ZIEMER:** Dr. Roessler wants to start the questions
2 here.

3 **DR. ROESSLER:** Your last statement was so dramatic that
4 I pretty near forgot my question. But you talked about
5 the Pierce data and the changes that could occur. My
6 concern when you were talking about it and looking at
7 how the changes might affect the probability of
8 causation were that you'd have to have -- feel that
9 it's a really strong study before those changes could
10 be implemented. But then you said that Dr. Land, in
11 making his recommendations to NIH, was taking some
12 other factors into consideration. And what are those
13 other factors?

14 **DR. HOFFMAN:** Well, primarily what's been found in
15 statistically analyzing the relationship of lung
16 cancer, radiation and smoking is now the relationship
17 is not dramatically dissimilar from what is seen for
18 other solid tumors. And so it is the information for
19 other solid tumors now that adds extra weight to the
20 justification for the update.

21 What has happened is that the original Japanese cohort
22 -- actually the incidence of smoking wasn't that high,

1 because during and right after World War II, cigarettes
2 weren't that prevalent to the Japanese. It's the
3 younger members of the cohort that began smoking
4 excessively. And it's that signal that has now
5 manifested itself into the more recent studies. Turns
6 out now that the frequency of lung cancer in the
7 Japanese cohort and that of the U.S. population is not
8 as different as it once was. And accounting for these
9 age differences in smoking, as well as the strong
10 difference between males and females -- females don't
11 smoke that much in the Japanese population, but most of
12 the compromises to a healthy lifestyle occur in the
13 male population. And so taking this evidence into
14 account, the Pierce study has justified its updates and
15 in my discussion with Charles Land, he considers this
16 to be serious enough to consider the updates, primarily
17 because there are groups, if we were not to update
18 IREP, who would not be compensated.

19 But the prime evidence he's taking into account is the
20 -- the additional evidence is the similarities seen for
21 other solid tumors.

22 **DR. ZIEMER:** Jim?

1 **DR. MELIUS:** Yeah, thank you for a very good
2 presentation. I want to go back to another issue.
3 That's the issue of the worker populations and how we -
4 - what we do about -- about them 'cause it seems to me
5 that has a -- a lot of concern on the part of claimants
6 and so forth, and there's always going to be sort of a
7 -- a major criticism or concern about this -- this
8 whole -- whole process. And now this question's for
9 you, but it's also for the Committee and -- and Larry
10 as to sort of how do we get engaged in a process that
11 can start to address that concern. I think when we
12 talked about this last time, part of -- one of our
13 ideas was well, we need to -- NIOSH was going to update
14 us, which I believe they'll do tomorrow about the
15 worker studies underway, but I thought -- your
16 presentation sort of triggered me to -- sort of some
17 thoughts. How do we get this process go-- seems to me
18 we need to have some ongoing effort to start to address
19 the -- start to make some comparisons and to look at
20 some ways that those studies could be utilized in IREP
21 and utilized in -- if only to say that they -- you
22 know, it's not ready yet, it's not time yet or

1 whatever, but it may be there are different approaches
2 to doing it. You mentioned some which I guess --
3 again, made me think about this -- was the idea of what
4 does it do to uncertainty and so forth rather than, you
5 know, is the -- cohort's large enough or whatever and
6 do that. So I don't know if you have any thoughts,
7 Owen, or anybody else does on sort of how we get a
8 process going that would start to -- 'cause I think
9 it's going to take us some time to do this. It's not
10 something we can do in a meeting or two, but it's
11 something if we got somebody working on it, you know,
12 maybe a year from now or several months from now we
13 could have, you know, a product that we could start to
14 talk about and think what might -- might be done. So
15 Owen first --

16 **DR. HOFFMAN:** Well, the reason I include this in my
17 talk is I recognize that the uncertainties in IREP --
18 they're not statistical uncertainties. These are more
19 degrees of belief, they're more of a Bayesian
20 quantification of state of knowledge. And when we get
21 into quantification of state of knowledge, all the
22 evidence -- all the evidence available should be taken

1 into account. Currently because the Japanese data is
2 the gold standard and because we based it on the 1994
3 data on cancer incidence -- I mean that's what we've
4 benchmarked the risk assessments within IREP upon, but
5 it doesn't mean that at some future date other datasets
6 couldn't be brought to bear so that we have a more
7 complete expression of the state of knowledge within
8 the uncertainty estimates.

9 Now how to do this, whether one takes my approach and
10 gives subjective weights to each of the independent
11 studies, or whether one does a med analysis or whether
12 other -- other types of approaches are used, I mean
13 that's basically up to NIOSH, this Committee and the
14 epidemiological branch of NIOSH in concert with Fadesh
15 Amensei* I think to -- to undertake. And maybe some of
16 this will be forthcoming within the update of BEIR VII.

17 **DR. MELIUS:** Yeah, just to follow up on that, is there
18 some way that you've thought about this, Larry, of, you
19 know, commissioning some group to do an evaluation or
20 at least to start to pull some of this information
21 together in a way that might -- and bring it to bear on
22 this 'cause I've not seen that done in any sort of

1 systematic way.

2 **MR. ELLIOTT:** Right, we haven't done that, but we're --
3 the only reason why is we're anxiously waiting to see
4 what the BEIR VII committee does. You know, once they
5 come out with their final report, it's not only going
6 to talk about where the States -- United States' Energy
7 employees occupational health studies are at, it's also
8 going to talk about the new -- the dose reconstruction
9 for the LSS. That's going to be very interesting to
10 see.

11 There's also radiobiology coming out of that review, so
12 we're anxiously awaiting that. And dependent upon what
13 that report says, yes, then we'll have to make a
14 decision. Did they take it far enough, in our opinion?

15 If not, then we need to commission, or perhaps under
16 contract support, get somebody working on these things
17 to pull this information together for use.

18 **DR. MELIUS:** Remind me that the -- our estimated
19 completion for BEIR VII.

20 **MR. ELLIOTT:** Well, I talked just this past week with
21 people on that committee, and it's likely to show up
22 sometime next year -- and not early next year, probably

1 mid-year, if not later.

2 **DR. MELIUS:** No reflection on Dr. Land, but I just keep
3 -- finalization of his work -- IREP keeps getting
4 extended out also, so -- in true epidemiological report
5 fashion, another...

6 **DR. HOFFMAN:** As you know, we're working closely with
7 Dr. Land, and I think -- to be very honest with you, I
8 would say it's out within six weeks.

9 **DR. ZIEMER:** Tony has a question.

10 **DR. ANDRADE:** Following up on the whole idea of just
11 when something like this might be ready to come out, if
12 you will, and to be evaluated for inclusion or
13 consideration -- for inclusion in IREP, you know,
14 Bayesian statistics relies very heavily on having a good
15 prior. But studies have shown, even Monte Carlo
16 studies, on prior distributions that if you vary them
17 somewhat, they're pretty robust so long as you have
18 good basic data. So it may not require cohorts of tens
19 of thousands or 10,000 to make an assertion about
20 whether or not you've reached some sort of interval of
21 confidence.

22 In the data you showed with respect to smoking --

1 light, moderate and heavy for males or females -- do
2 you have any idea what sort of populations they were
3 looking at, the number or --

4 **DR. HOFFMAN:** It was a subset of the full cohort. What
5 -- I'd have to revisit the whole paper to say what
6 fraction that -- it wasn't the full cohort. It was a
7 fraction of the cohort, but I think that fraction was
8 on the order of 30 percent.

9 **DR. ZIEMER:** Jim, you have another --

10 **DR. MELIUS:** Yeah, just back to the worker population
11 issue again, I still think even given that time frame
12 on BEIR VII that if NIOSH could think about some ways
13 to get that process going beforehand that would not,
14 you know, sort of undercut or be undercut by BEIR VII
15 but be a way of starting to work -- make some progress
16 on that 'cause I hate to put this off another three or
17 four years before the -- the issue gets evaluated in
18 some way. Now maybe it's not possible to do 'cause
19 BEIR VII is so -- such a comprehensive relook at
20 things, but I think it might be helpful.

21 Back on the smoking issue, I guess my question is --
22 for Larry and NIOSH is what are your thoughts on

1 addressing this? I didn't realize that Charles Land's
2 completion was in six weeks.

3 **DR. HOFFMAN:** If it weren't for this, it'd be out now.

4 **DR. MELIUS:** Yeah, I know, I know. That's what I'm
5 saying.

6 **MR. ELLIOTT:** Yeah, we were hoping it'd be out by now
7 and we, too, have been in communication with Charles.
8 And you know, it's been a three-way communication -- us
9 to SENES and SENES to NCI and us to NCI. Let me assure
10 the Board that we've not finalized any cases -- lung
11 cancer cases yet where a smoker was found to be a non-
12 compensable case. All our lung cancer cases that have
13 gone forward have been compensable. We wanted to bring
14 this before the Board because we knew the Pierce
15 article was out. We appreciate Owen's working up some
16 examples. It kind of starts us thinking about these
17 kind of situations. We're very much interested in the
18 Pierce paper. It's one paper, though. It's just one
19 set of findings. And I think there's only 620-some
20 lung cancer cases that were evaluated and only 300 of
21 those had smoking. Is that right? Something like
22 that? So -- to get back to your question earlier, so

1 yeah, we're looking at it. We're considering it and
2 we're thinking through what we see there. That's about
3 all we can say at this point in time.

4 **DR. MELIUS:** Press you on this a little bit, can -- can
5 we say that it's something that we can -- should be
6 ready to deal with at the next meeting or --

7 **MR. ELLIOTT:** I don't think we're going to be ready to
8 deal with this at the next meeting if you're going to
9 meet within the next two months.

10 **DR. MELIUS:** So what, six months from now? I mean --

11 **MR. ELLIOTT:** Well, I'm not going to -- I'm not going
12 to give you a commitment as to when you're going to be
13 -- we're going to be ready to present something to you.

14 We've got a lot of legwork here to do. We're going to
15 do that with SENES. We're going to do that with NCI,
16 and we're going to reach out to other experts and get
17 what -- what their thoughts are on this before we bring
18 it to the Board.

19 **DR. ZIEMER:** Henry?

20 **DR. ANDERSON:** Yeah, this is -- perhaps is more of a
21 technical question. It seemed on all of your odd
22 graphs, like on the smoking things, you -- all the age

1 groups had the same confidence interval size, and I
2 would have thought that, given the small number of
3 cases that -- I mean the number of lung cancer cases in
4 those people under age 40, there are people who would
5 argue that's a different cancer than in older group,
6 but I would have thought confidence intervals as you
7 age ought to get narrower because of the larger number.

8 And the other, of course, excess relative risk, is
9 often driven by the denominator or the base background
10 level as the background rate goes up, getting really a
11 -- large numbers of excess relative risk is difficult,
12 just -- I mean physically there you've -- everybody
13 would have to have the disease if the background's low,
14 so it is somewhat size of the population driven, and
15 that's -- I just ask what your thoughts or how you
16 might go about --

17 **DR. HOFFMAN:** Well, yes, and you remember initially I
18 said I was going to give you some initial implications.

19 Well, buried within that comment was the fact that the
20 initial data that we had to start with in the Pierce
21 paper doesn't explicitly give us the confidence
22 intervals for all these categories. What they give us

1 are the confidence intervals for a different smoking
2 category at age 60 to 70 at time of diagnosis of
3 disease. Then they give us a table where there are
4 just multipliers for the other categories, without
5 confidence intervals. So to give you initial
6 implications, it was just the simple arithmetic -- the
7 multiplication that was done, so don't over-interpret
8 the confidence intervals that are in the slides.
9 Everything you say is true, and those are some of the
10 things that Charles Land is dealing with is the age-
11 specific confidence intervals that would be
12 appropriate.

13 **DR. ZIEMER:** Okay. Tony?

14 **DR. ANDRADE:** Just to respond to Jim, my question
15 earlier was meant to put this in context, especially
16 when you're dealing with analysis -- the Bayesian
17 probabilistic analysis. In other words, you do away
18 with (inaudible) stuff. Only until -- and you don't
19 know when this really is. Only until you have a
20 sufficient prior distribution, one that's really
21 populated with a lot of good data, and that can be
22 jostled around via Monte Carlo techniques or whatever

1 so you change it around just a little bit, but the
2 outcome of probabilistic calculations give you the same
3 relative confidence levels do you feel comfortable
4 about the results of your analysis. And typically, you
5 know, even after you've put together a prior, that sort
6 of research and analysis takes somebody one or two
7 years. So it's a tough science, but it gives
8 ultimately better answers.

9 **DR. HOFFMAN:** And for those who have some knowledge in
10 Bayesian approaches, I just want to say that the
11 uncertainties that we produced through IREP, these are
12 -- and they're not statistical uncertainties. They are
13 like Bayesian uncertainties. More technically, they're
14 informative priors waiting for the next dataset to come
15 in to allow us to update. But the systematic process
16 of prior update -- new prior update has yet to occur.

17 **A REFRESHER AND UPDATE**

18 **ON REF'S ASSUMED IN IREP**

19 **DR. ZIEMER:** Okay. Then I think we're ready to
20 continue with the next part of this section, and Dr.
21 Kocher is going to come to the podium now. His
22 background is in experimental nuclear physics, now

1 senior scientist at SENES and has had over 28 years of
2 experience in environmental health physics, including
3 development and application of models and databases for
4 assessing doses to the public due to radionuclides in
5 the environment. He's developed the probability
6 distributions of radiation effectiveness factors for
7 different types of radiation to represent biological
8 effectiveness in causing cancers in humans.

9 Dr. Kocher, glad to have you here to speak on this next
10 topic, give us an update on REF's.

11 **DR. KOCHER:** Yes, thank you very much. I gave a fairly
12 detailed technical presentation on this subject because
13 it was completely new at one of your meetings in Denver
14 early last July, and I can really summarize part of my
15 remarks in about 15 seconds by saying that there have
16 been no changes made in the information that was
17 presented last July, nor have we received any
18 information which clearly indicates that we made a
19 gross error somewhere. So basically what I want to do
20 today, because it is a difficult subject, is to give
21 you more of a broad qualitative overview of what we did
22 compared with the more detailed technical presentation

1 last time, and to particularly highlight what I called
2 issues. And by that I mean areas where judgment in the
3 face of poor data really came to the fore, and these
4 indicate areas where possible future work might be
5 helpful in improving our state of knowledge about this.
6 Next, please. Let me just remind you what these REFs
7 are. They are factors in the risk equations which
8 represent the biological effectiveness of different
9 types of radiation for the specific purpose of
10 estimating cancer risks and probability of causation.
11 These quantities are different from, but analogous to -
12 - if you want to have a frame of reference for what
13 these things are, they are analogous to quality factors
14 and radiation weighting factors that are used in
15 radiation protection.
16 But there's a fundamental difference between REFs and
17 the radiation protection quantities. And that is that
18 they take into account uncertainty in our state of
19 knowledge. All of these REFs are expressed as
20 probability distributions that are intended to
21 represent uncertainty, state of knowledge, whatever
22 term you like. And I would emphasize also that they're

1 subjective representations of uncertainty. The
2 probability distributions that we've developed in many
3 cases certainly are not the kind of frequency
4 distribution you would get if you could actually do
5 experiments to measure these things in humans. They're
6 just our best representation of what we think we know.
7 The radiation types for which we've developed REFs are
8 listed in the next to the bottom line there --
9 neutrons, alpha particles, photons and electrons.
10 Whenever you talk about biological effectiveness, you
11 have to have a so-called reference radiation, which is
12 the -- the baseline radiation for which you assume that
13 the effectiveness is unity and everything else is
14 relative to that. And we chose -- our reference
15 radiation is high energy photons delivered acutely,
16 because that's the radiations to which the A-bomb
17 survivors were exposed. And as you've heard many
18 times, the A-bomb survivors is the source of almost all
19 of our data on radiation risks that are used in IREP to
20 calculate PC.

21 Now I'm going to skip this slide and the next one, for
22 those of you in the handout. These just go over the

1 risk equations that show how an REF is used to
2 calculate risk. And I skip it because it's not really
3 germane to my overview here about what we did and what
4 the problems are. Just remember that REFs are things
5 that are used to put biological effectiveness on a
6 common scale for all radiation. So the main reason I
7 don't go over it is because it's right after lunch and
8 glazing eyeballs would result, and we can't have that.
9 Okay. So I'm going to spend a few minutes just talking
10 about how I went about this. As you may know, there's
11 enough radiobiological literature in this area to fill
12 this room, and we had no time or intention to go
13 through all this literature. But fortunately, quite a
14 few experts and expert groups have reviewed the
15 radiological -- radiobiological data -- the quantity is
16 RBE, stands for Relative Biological Effectiveness.

17 This is what you get in basic radiobiological studies.

18 There've been thousands of experiments to measure RBE
19 for all kinds of endpoints, all kinds of organisms, all
20 kinds of radiations. And fortunately this information
21 has been extensively reviewed by groups like the NCRP,
22 the National Radiological Protection Board in the UK,

1 experts like Tori Kromse* who did the careful
2 evaluation of all the data for tritium, so we basically
3 relied on the reviews by other groups.

4 Now they did not come up with probability distributions
5 of the data. We looked at the summaries and
6 evaluations of data to derive our own subjective
7 probability distributions. This was not done for us.
8 Most of the data that we reviewed came from studies in
9 small mammals like the mouse and beagle dogs. Lots of
10 data on mammalian systems, cells of mammals -- human
11 lymphocytes, for example, was a -- is a common
12 biological organism that's studied. Unfortunately,
13 very limited on humans to address questions of
14 biological effectiveness of different radiations. And
15 really the key to all of this is that we have to use
16 judgment in applying the available data on RBEs for a
17 variety of systems and a variety of biological
18 endpoints to say that represents the biological
19 effectiveness with respect to cancer induction in
20 humans. That may be a substantial leap of faith, but
21 we cannot really do very much about it.

22 Next, please. Okay, I'm just going to go through the

1 different radiation types very quickly. I'm not even
2 going to present any numbers, although if people are
3 interested in knowing well, what did you assume for
4 alpha particles in leukemia, I mean I have the numbers
5 with me. We can discuss any of this in detail that you
6 want.

7 Starting with neutrons, first of all there's clear
8 evidence from a lot of studies in mice that there's a
9 difference in biological effectiveness for neutrons if
10 the endpoint is solid tumors versus leukemias, and so
11 we developed separate probability distributions for
12 those two types of cancers. The REF is generally less
13 for leukemias than for solid tumors.

14 We know -- we have some indication from studies, and
15 calculations certainly indicate, that the REF for
16 neutrons depends on the energy. I mean there's a wide
17 range of neutron energies that are potentially relevant
18 to exposures to any group that you're interested in,
19 ranging all the way from thermal neutrons to really
20 high energy neutrons if you're concerned about
21 astronauts and people like that. So we developed REFs
22 for three different -- actually five bins of energy,

1 but only three different distributions of REF, because
2 two of the pairs were the same. The highest REF is the
3 first on there, the fission neutrons, the category from
4 0.1 to 2 MeV. Somewhat lower REFs for the second line
5 that you indicate there, 10 to 100 keV to 2 to 20 MeV;
6 and the lowest REF for less than 10 keV and greater
7 than 20 MeV. And the reduction on average was about a
8 factor of two in going down each of those steps, so the
9 bottom line is about a factor of four or less, on
10 average, than for fission neutrons. But of course we
11 have uncertainty in all of this.

12 In addition in the calculation we include -- we have a
13 small increase in the REF for either solid tumors or
14 leukemias and at any energy under cases of chronic
15 exposure. And this accounts for what's called the
16 inverse dose rate effect. There's some evidence from
17 studies in animals that if you take two experiments
18 where you deliver the same dose, if in experiment one
19 the dose is delivered acutely and experiment two the
20 same dose is delivered chronically, there is some
21 evidence that the response is higher in the group that
22 gets the chronic dose, so it's an inverse dose rate

1 effect. The biological effectiveness goes up as the
2 dose rate goes down. And there's a small correction
3 amounting to about 40 percent on average for chronic
4 exposures.

5 Next, please. Next is alpha particles. Here again we
6 have separate distributions for solid tumors and
7 leukemias, based on some evidence, again, that the REF
8 is substantially higher for solid tumors than it is for
9 leukemias. The difference between alpha particles and
10 neutrons is that we do not have an energy-dependent
11 REF. It's the same for all energies. Basically we're
12 concerned only about -- so far we're concerned only
13 about alpha particles from radioactive decay. And
14 Mother Nature was kind to us, the energy range over
15 which these vary is quite narrow. It's like 4 to 8
16 MeV, roughly.

17 We also included a very small factor to account for
18 possible inverse dose rate effect. Here again the data
19 are not conclusive as to whether it's real or not,
20 especially at the doses and dose rates we're interested
21 in, but there's a small effect that averages, I don't
22 know, 20 to 30 percent on average. And this is applied

1 in all cases, because all exposures to alpha particles
2 from internal emitters are chronic.

3 Next, please. Well, this highlights what was one of
4 our real areas of challenge. It turns out that alpha
5 particles in leukemias is one of the areas on which we
6 do have potentially relevant information from studies
7 in humans. The unfortunate aspect of this information
8 is that it's totally contradictory, and so it leads to,
9 you know, a need to really provide judgment to what
10 you're doing, and I just want to take a second to
11 discuss the problem here.

12 There are basically three datasets that we looked at,
13 and the first two on there are datasets involving
14 humans. Number one there is this group called the
15 Thoratrast patients. These were some patients in
16 medical studies that were administered a special kind
17 of thorium called thoratrast, and there have been
18 health studies, follow-ups on these patients over the
19 years, and this group of individuals, taken as a whole,
20 shows a clear excess of leukemias compared with an
21 expected rate in an unexposed population. There's
22 clear evidence that this Thoratrast administered to

1 these people has led to increased incidence of
2 leukemia. You get this by comparing the leukemia risks
3 in this group with the leukemia risks in the A-bomb
4 survivors that were exposed to high energy gamma rays,
5 and from that you can kind of infer an REF. And we
6 developed a -- as you see there, a 95 percent
7 confidence interval of the REF between 1.0 and 15 based
8 on these data. You know, shows a -- shows a clear
9 effect.

10 But there are other groups of human populations. One
11 is the famous radium dial painters. Second is a group
12 of medical patients that were administered radium-224,
13 and in this group of patients there's no excess
14 leukemia of any kind been seen. In fact, if you assume
15 that the standard ICRP models for calculating dose to
16 bone marrow from radium in bone, and if you assume that
17 those standard ICRP models calculate dose to bone
18 marrow correctly, you would infer an RBE for alpha
19 particles and leukemias that's certainly less than one.

20 If you ignore uncertainty, you would infer an RBE of
21 zero.

22 So in the case of the Thoratrast patients we see a

1 clear effect. In the case of the patients and other
2 people administered radium, we see no effect.

3 Well, what I personally think the important issue here
4 is that in those two cases the dose is administered in
5 quite different ways. Thoratrast is a colloidal
6 suspension of a thorium compound, and that suspension -
7 - that compound tends to remain suspended in bone
8 marrow for a substantial period of time, so there's a
9 pretty good chance that the radiosensitive tissues in
10 red marrow are being irradiated in the Thoratrast
11 patients.

12 Now of course radium -- its deposit immediately on bone
13 surface and then over time is incorporated into mineral
14 bone, and so you're basically irradiating bone marrow
15 from the skeleton and not from the marrow itself, and
16 it's entirely possible that the reason that you don't
17 see any leukemias in this population is because the
18 alpha particles which have very short range are not
19 irradiating the tissues that you're interested in. But
20 I don't know. You know, my -- basically what I'm
21 saying here is that the dosimetry in those two cases is
22 quite different, and that could be the explanation for

1 this.

2 A third piece of information has to do with the data
3 for fission neutrons. I mean it's been widely held
4 that fission neutrons and alpha particles -- and
5 there's a lot of evidence for this -- are roughly the
6 same in terms of biological effectiveness. So you
7 could infer that the REF for fission neutrons in
8 leukemias ought to apply to alpha particles, as well.
9 And for neutrons you'd be fairly certain that you were
10 irradiating the radiosensitive tissues because they --
11 you know, they penetrate the body easily.

12 So what we were faced with here is three different sets
13 of information, two of which are on humans and they're
14 directly contradictory. And the way you handle this,
15 in our view, is not to say well, I'm going to pick the
16 one that I think is best and go with it. What we do is
17 give a subjective weight to each one of these as being
18 plausible.

19 Now those numbers -- 50 percent for the Thoratrast
20 patients, 25 percent for the other human populations
21 and 25 percent for fission neutrons -- that's, you
22 know, to be clear about it, fairly arbitrary. It's

1 what gives you a warm fuzzy feeling, and it's certainly
2 arguable about that. And I'm going to return to the
3 issue of this in my later remarks, but this is an
4 example of an area where judgment is absolutely
5 essential. You have to take data and try to resolve
6 and figure out what you think it means.

7 Next, please. This is an important curve. We're
8 moving now to the case of photons. This is a
9 calculation of the quality factor that was done by the
10 ICRU about 15 years ago. Our reference radiation,
11 which is high energy gamma rays, sits right here on
12 this curve. The calculation shows as you go down in
13 energy at about 200 to 250 keV, it's about -- you reach
14 a plateau where the quality factor is about twice that
15 what it is down here, and below about 30 keV it
16 continues to increase (indicating). Now we did not use
17 this curve to infer what the REF for low energy photons
18 would be. We used this curve to infer over what energy
19 ranges would our assumed REFs apply.

20 There are lots and lots of data for what's called
21 orthovoltage* X-rays, and that means X-rays where the
22 tube potential is about 180 to 250 keV, something --

1 kilovolts, somewhere in there. But it turns out that
2 that's not the energies of the X-rays, of course. The
3 X-rays on average have substantially lower energies.
4 And typically the average energies from these high
5 energy X-ray machines are about 60 to 70 keV, so they
6 fall in here. So there's a lot of data in this energy
7 range, and we use this curve to assume that whatever
8 REF we inferred for photon energies down here would
9 apply up some plateau here. And similarly, there's no
10 data down here below 30 keV, and we used this curve to
11 imply an increase.

12 Next. Now for these -- these intermediate energy
13 photons, the data -- the energy range for which there's
14 a lot of data for higher energy X-rays. This was
15 another case where we had to make some inferences based
16 on information which could lead to different
17 conclusions if you just took one dataset by itself.
18 There's a lot -- the only studies of X-rays relative to
19 gamma rays per se that we found have to do with
20 induction of dicentric* chromosomes in human
21 lymphocytes, and I'll discuss later possible weaknesses
22 with this dataset. But these data clearly show that

1 for this endpoint that the orthovoltage X-rays are
2 clearly biologically more effective than high energy
3 gamma rays, without exception -- average value around
4 two and a half, something like that. The confidence
5 interval -- well, this is not the confidence interval
6 for that dataset alone, but between one and about six
7 was the confidence interval for that dataset alone.
8 We modified that using what I called indirect
9 inferences. And these -- let me give you an example of
10 an indirect inference. Somebody is doing a study of
11 the biological effectiveness of high energy protons,
12 say. And that investigator does two studies, one in
13 which the reference radiation is high energy gamma
14 rays, and he does another study of protons in which the
15 reference radiation is X-rays. Well, you can compare
16 the RBE that he gets from those two studies and infer
17 an RBE for the X-rays, 'cause he gets a different
18 answer for his protons depending on what the reference
19 radiation is. And by making a comparison, you can --
20 between the two reference radiations, you can infer
21 what the RBE for X-rays was. And it turns out that
22 there's about -- I don't know, ten or so studies out

1 there that we found reviewed in the literature where
2 you could make an inference. And these studies all
3 showed a clear indication that X-rays were biologically
4 more effective than high energy gamma rays, without
5 fail.

6 So we combined those two sets of information together
7 to come up with a 90 percent -- 95 percent confidence
8 interval between one and five, based on shall we say
9 non-human data.

10 But there's another set of information out there, and
11 this is what Iulian Apostoaei talked about this
12 morning, information on induction of thyroid cancers in
13 children especially, because there are data for the
14 Japanese A-bomb survivors that were exposed to high
15 energy gamma rays, and there are lots of childhood
16 studies where children of various ages were exposed to
17 X-rays, and you can compare the risk per unit dose, the
18 ERR per sievert, basically, for those two studies. And
19 what Iulian showed is when you look at the dataset, you
20 really don't see a statistically significant difference
21 between the risk of thyroid cancer in the A-bomb
22 survivor children and the risk of thyroid cancer in

1 children exposed to X-rays. You don't see a
2 statistically significant difference. And from that we
3 inferred that an equal biological effectiveness between
4 these two radiations could not be ruled out.

5 Now the truth of the matter is, if you look at these
6 data and you take the statistical uncertainties without
7 bias, without subjective judgment, it neither refutes
8 nor supports an assumption that the biological
9 effectiveness is the same, it neither refutes nor
10 supports an assumption that they're different. But we
11 used that information to assign a relatively small
12 weight to the possibility that the biological
13 effectiveness is the same.

14 And there's similar information, although weaker, for
15 other cancers. If you look in the latest UNSCEAR
16 compilations, for example, they don't show any
17 difference in the ERR per sievert between childhood
18 exposures to X-rays and -- or adult exposures to X-rays
19 and exposure to gamma rays in the A-bomb survivors. So
20 here's another case where we apply judgment to say
21 we're going to give 75 percent weight to this dataset
22 which clearly show an effect, and we give 25 percent

1 weight to this other dataset that is inconclusive.
2 Next, please. For photons less than 30 keV, remember
3 the curve from the ICRU that -- the quality factor
4 increased below 30 keV? We found no data in that
5 energy range, but we assumed that that curve described
6 an increase relative to the intermediate energy photons
7 from that calculation, but we assumed that the
8 correction was energy independent. We did not put an
9 energy-dependent correction in there. It was described
10 by a triangular probability distribution.

11 Next, please. Electrons. There is a wealth of data on
12 the biological effectiveness of beta particles from
13 tritium decay. There's virtually nothing that we've
14 found on any other kinds of electrons. The problem
15 here is that the energies of electrons from tritium
16 decay are very low. The average energy is only about 6
17 keV, and we'd be curious of course about the biological
18 effectiveness higher than that. And we had to have
19 some way to say over what energy range can we apply the
20 information on tritium beta particles, 'cause it surely
21 doesn't apply just there. It may apply at somewhat
22 higher energies.

1 And so we used the following line of reasoning. When
2 you do a study to measure the RBE of photons, what you
3 are actually measuring is the RBE for the secondary
4 electrons that are produced in first collisions of
5 photons with atoms. That is what you are really
6 measuring. So if you know, for example, that photons
7 of a certain energy have an increased biological
8 effectiveness, you can derive what the energy range of
9 those electrons is that should have the same biological
10 effectiveness, and that's basically what we did. All
11 you have to know is what's the energy distribution of
12 Compton electrons as a function of photon energy,
13 what's the energy distribution of photoelectrons as a
14 function of photon energy, and what's the relative
15 importance of those two processes.

16 There again, nature was kind. Either the Compton
17 effect is almost everything or the photoelectric effect
18 is almost everything, and there's a small energy region
19 of up around 15 keV actually where they're more or less
20 the same. So you basically use what you know about how
21 photons interact to infer something about electrons.
22 And from this, to make a long story short, you assume

1 that the tritium data would apply at energy -- any
2 energy less than 15 keV, based on how the photon
3 quality factor works, and we apply this to average beta
4 energies less than this, or energies of discrete
5 electrons less than that.

6 These problems of Auger-emitting radionuclides in DNA,
7 this is a tough problem. Let's just hope that the DOE
8 program doesn't encounter this very often. You
9 basically are going to have to get help from experts in
10 microdosimetry I think to work this out.

11 Next. Well, I talked about how you can, you know, use
12 your knowledge of Compton scattering in the
13 photoelectric effect to infer REFs for electrons where
14 you don't have any data, and what is easy to show is
15 that this 30 to 250 keV range where we have an elevated
16 REF for photons, that corresponds to average electron
17 energies between about 15 and 60 keV.

18 However, and I think this was a reasonable decision,
19 even though you can do this calculation and you have a
20 lot of confidence in it, we have not yet adopted an REF
21 for this intermediate electron -- energy electron
22 range. We still assume that it's one. And there were

1 two reasons for this, 'cause we lacked data in two
2 areas.

3 First, we don't really have any biological data on
4 photon energies greater than about 70 up to about 250.

5 Remember, I emphasized the point that these
6 orthovoltage X-rays, the average energies are mostly
7 around 70 keV or below, so we don't have any firm
8 evidence at the higher energy photons that we're
9 interested in. And secondly, we don't have any data on
10 electrons other than tritium beta particles. Where
11 this energy range might possibly come into play is if
12 you had anyone exposed to carbon 14. I think nickel 63
13 is another one where the betas fall in this energy
14 range.

15 Next, please. Okay, now I'm going to go back through
16 each of the four radiation types and revisit what some
17 of the issues are that future activity might be
18 beneficial. Starting first with neutrons, we found no
19 data on RBE at the lowest energies at the highest
20 energies, so we basically had to assume that the
21 assumption by ICRP that the RBE was about four times
22 less than it was for fission neutrons, we had to assume

1 that that provided a reasonable central estimate. Of
2 course we included some uncertainty in this
3 extrapolation, but it is an assumption on -- for which
4 there's basically no data that we found. In my
5 checkered career I actually got a few of these. I used
6 to work in an accelerator lab that handled tritium and
7 we had deuterium beams and they give high energy
8 neutrons.

9 There are a few data on these intermediate energies and
10 the somewhat higher energies compared with fission
11 neutrons, and it turns out that some of the data show a
12 decrease, as expected by the calculation. But there's
13 some data that show no effect. So the database here I
14 would characterize as weak. There's no direct evidence
15 that the correction for an inverse dose rate effect
16 should be applied under conditions of chronic exposure.

17 This is not a big ticket item. It's only, you know,
18 30 to 40 percent on average.

19 Our REF for the lowest energy neutrons ignores the
20 possibility that the REF could in fact be less than
21 one, could be substantially less than one, like maybe
22 .5. And the reason is, the lower bound of our

1 distribution is at one, but the reason that it could be
2 less than one at these energies, when a neutron of this
3 very low energy impinges on tissue, the radiation that
4 causes most of the dose eventually is high energy
5 photons from capture by hydrogen nuclei of the
6 neutrons, and those photon -- that photon energy is 2.2
7 MeV, and that's quite a bit higher than the cobalt 60
8 gamma ray energy of about 1.3 MeV. And calculations
9 have suggested that the effectiveness of the 2.2 --
10 that the effectiveness continues to drop as the photon
11 energy increases. But it at most would be a factor of
12 two, but probably not that much, but we have no
13 accounting of that in the present situation.
14 Conversely, the REFs in humans may be overestimated
15 when the neutron energy is -- no, the REFs may be
16 underestimated when it's greater than .1 MeV. What's
17 going on here, in the mammal studies most of the dose
18 is delivered by the higher LET radiations because the
19 distance through tissue that you have to traverse is
20 relatively small. In humans you have to go through
21 more tissue, you get more high energy photons that are
22 delivering the dose to deep-lying organs and tissues,

1 so that the animal data may in fact overestimate the
2 REF in humans at these energies, and we've made no
3 accounting for this.

4 Now the ICRP has done a lot of calculations of this and
5 what they show is that this effect is a very
6 complicated function of the neutron energy, the
7 particular organ being irradiated and the irradiation
8 geometry.

9 Next, please. Alpha particles. I talked at great
10 length about the problem of what's the REF for alpha
11 particles and leukemias. It would be interesting to
12 resolve the discrepancies in human data. My basic
13 approach to coming up with our hybrid distribution was
14 to say look, you probably have trouble with your
15 dosimetry models for alpha emitters in skeleton, but I
16 don't think you should bury considerations of
17 biological effectiveness in your problems in dosimetry.

18 If you've got a problem in dosimetry, go fix it. What
19 we want to know is, if the dosimetry is done correctly,
20 what's the biological effectiveness of alpha particles.

21 And so that's the approach we took. But there's a lot
22 of work that could be done here, for sure.

1 Again, is the inverse dose rate effect real or not;
2 this is a very small deal. Another deal that I don't
3 think is very important is that almost all the data on
4 RBE for alpha particles, the reference radiation was
5 high energy beta particles delivered chronically
6 because that's the way alpha particles deliver dose, so
7 there's no data relative to what we have assumed as the
8 reference radiation. I don't think this is a big
9 problem because there is some evidence that these high
10 energy electrons and high energy photons have the same
11 biological effectiveness as we have assumed.
12 Next, please. What about photons? There basically is
13 no animal data on X-rays and cancer endpoints. There
14 are these studies of cellular effects, effects on
15 chromosomes, things like that, but no data on cancer
16 endpoints. And one of the criticisms that we got when
17 we used the human lymphocyte data to infer this is, you
18 know, that okay, induction of these chromosome
19 aberrations, that's not cancer yet. And you've all
20 heard the stories of you can see chromosome effects in
21 all these populations that live in very high background
22 areas, but you can't see excess cancers. So it would

1 really be nice if there were animal data on the
2 difference between X-rays and gamma rays for cancer
3 endpoints. We're assuming that the cell data applied.

4 I mentioned before, no data at the lowest energies,
5 and these energies between 70 and 250.

6 Iulian again this morning talked about the importance
7 of fractionation of X-rays and childhood exposures.
8 Remember we gave 25 percent weight to an assumption
9 that there's no difference between X-rays and gamma
10 rays based on the human data, the human childhood data.

11 Now what Charles Land has done and what Iulian
12 recommended be incorporated is basically say look, what
13 you see in those data is the law of compensating
14 factors. There is an increase -- there should be an
15 increase in effectiveness of X-rays in the childhood
16 thyroid cancers, but it's masked by the DDREF because
17 those exposures were given in a protracted fashion
18 rather than acute. You know, if the RBE is two and the
19 DDREF is two, they cancel and you see no effect, which
20 is what the data show. So if we really decided that
21 the childhood thyroid data really represent high energy
22 photons delivered acutely, that could call for a re-

1 investigation of the assumption that 25 percent rate
2 should be given to an assumption that there's no
3 difference. It would tend to reduce the weight that's
4 given to this assumption because you're now assuming
5 that the childhood data really do show an effect when
6 you consider the fractionation problem.

7 Next. The electrons -- there's a lot of data on
8 various -- on a large number of different stochastic
9 endpoints. There's relatively few data on
10 carcinogenesis endpoints, and on average, the RBEs tend
11 to be a little bit lower than for other endpoints. Of
12 course, given the preponderance of data, we gave the
13 greatest weight to the non-cancer endpoints, so this
14 could be the same problem that we found for photons.
15 But still, these data in general show some increase,
16 just less on average than for other endpoints.

17 No data on RBE at energies higher than tritium beta
18 particles, and the REFs for these very low energy Auger
19 electrons -- these typically are less than one keV, and
20 they are copious in decays of some radionuclides, these
21 ones that decay by so-called electron capture decay.
22 And when they are incorporated into DNA, the RBE could

1 be 40, 50, 60, 100 -- I mean it's huge, and so if we
2 encounter any situations like this, care is really
3 called for.

4 Next, please. I was asked to speculate on what we
5 might develop that we don't have. It's conceivable
6 that in some programs, perhaps not this one, that you
7 would need REFs for protons and heavy ions including
8 recoil nuclei and fission fragments.

9 Do we have any cases of internal exposure to
10 Californium 252 in this program?

11 **DR. NETON:** Not yet, no.

12 **DR. KOCHER:** That'll be a hoot if one of those comes
13 in, because I -- I swore I was going to look up the
14 number and I failed to do it. I think the spontaneous
15 fission branch for Californium is like nine percent, so
16 you know, good luck.

17 Next. And those fission fragments deposit a lot of
18 energy over a short distance.

19 The last point I want to mention is something that
20 Brian Thomas mentioned this morning, is that I
21 developed this new help file to guide users in
22 selecting radiation types. The menu has 11 different

1 types of radiation, but you're not necessarily going to
2 have the data in exactly the form that IREP wants, so
3 this request came from NCI, not from NIOSH, because
4 NIOSH and its contractors knows -- they know what IREP
5 wants and they presumably know how to do it, but you
6 know, NCI is passing essentially the same version of
7 this code over to the Department of Veterans Affairs to
8 handle claims by the atomic veterans. And since I
9 served on this committee you're going to hear about in
10 the next presentation, I knew that the medical guy at
11 the VA is not getting the information that IREP wants.

12 I mean I know this. And so I worked up a fairly
13 detailed help file, basically to help the medical
14 officer at the VA do this correctly. But it also
15 should be of general use for anybody who wants to get
16 into IREP and play around with it, but the dosimetry
17 information they don't quite know what to do with it.
18 And I knew this going in when I worked on these REFs,
19 but especially was impressed upon me when I tried to
20 develop a help file for internal exposure.

21 It is clear that if you're not given the information
22 that you want, if you're going to make some assumptions

1 about what radiation type to enter, sometimes it's
2 straightforward, but it's easy to encounter cases where
3 you absolutely have to have your fanny screwed on
4 straight. You've got to know about radioactive decay,
5 you've got to know about biokinetics, you've got to
6 know about sites of deposition and what organs are
7 being irradiated. You've got to know a lot. There are
8 radiations which could be encountered where four
9 different radiation types are emitted in the decay of
10 that radionuclide and they all contribute somewhat
11 significantly to the dose. You know, these are --
12 external exposure I think, relatively speaking, is a
13 piece of cake. But internal exposure -- I won't say
14 problems could arise. You have to know what you're
15 doing. You can't fly by the seat of your pants.
16 But again, this should not be an issue for NIOSH and
17 the contractors because they presumably know all this.

18 But I'd be interested in hearing a presentation
19 sometime about how they do all this, just to make sure.

20 Thank you.

21 **MR. ELLIOTT:** Thank you. Thank you, Dr. Kocher. It
22 was a very illustrious, informative presentation. I

1 think it's always good to take us all back -- the Board
2 as well as NIOSH staff -- in understanding and
3 realizing what the scientific basis and underlying
4 assumptions are on -- that we come to grips with on
5 radiation effectiveness factors.

6 Are there any questions for Dr. Kocher? It was all
7 that clear.

8 **DR. KOCHER:** Stunned them again.

9 **MR. ELLIOTT:** We're stunned. Well, I'm sure that
10 you'll be able to get him in a moment, if you wish, on
11 a one-on-one basis.

12 **DR. KOCHER:** I'll be here till 8:40 tomorrow if anyone
13 wants to talk to me.

14 **MR. ELLIOTT:** All right. In the absence of the Chair,
15 who had to excuse himself, you're at a break. Be back
16 in 15 minutes.

17 (Whereupon, a recess was taken.)

18 **DR. ZIEMER:** Before we listen to our next presenter, I
19 want to remind members of the public that if you do
20 wish to make comments during the public comment period
21 which will be at 4:15, please register at the table in
22 the back with Cori. There's a sign-up sheet back

1 there. We need to have some idea of how many wish to
2 speak so that we can allot the time accordingly, so
3 please do that if you haven't already.

4 **NAS REPORT ON REVIEW OF DTRA**

5 **DOSE RECONSTRUCTION PROGRAM**

6 Now our next presenter will be Dennis M. Schaeffer,
7 better known as Mike Schaeffer. Mike Schaeffer is here
8 representing the dose reconstruction program of the
9 Defense Threat Reduction Agency, and more particularly
10 he's going to take a few minutes and tell us a little
11 bit about the newly-issued report of the National
12 Academy of Sciences, and you have in your packet a pre-
13 publication copy of the executive summary. The full
14 report will be out soon, I guess -- maybe Mike will
15 tell us that and there'll be an autograph party at
16 Barnes & Noble's on that, Mark -- or Mike?

17 **MR. SCHAEFFER:** Probably around June.

18 **DR. ZIEMER:** Okay. Well, anyway, please welcome back -
19 - Mike's been with us before, and please address the
20 Board at this time.

21 **MR. SCHAEFFER:** Thank you, Dr. Ziemer, for the
22 introduction, and I'd like to brief just at the very

1 top level the recent report that was released by the
2 National Academy of Science on DTRA's dose
3 reconstruction program.

4 I apologize for not having any slides today because
5 this was given to me at short notice, and so I'll try
6 to be brief and take you through the -- just the top
7 level details.

8 This particular study was commissioned two and a half
9 years ago as a result of a Congressional mandate
10 following on the heels of a General Accounting Office
11 audit of the dose reconstruction program. And one of
12 the major recommendations of the General Accounting
13 Office was should or should there not be continuous
14 oversight that had been somewhat lacking over the years
15 in our dose reconstruction program. Keep in mind that
16 we have been constructing doses on the order of over 20
17 years during the course of our program that started in
18 1978. So this report represents an important
19 milestone, not only where we are in the program, but
20 encompasses the entire experiences that we've had in
21 this program from day one. Until your program was
22 created for the Energy workers, this was a one-of-a-

1 kind program. And I just wanted to remind you of all
2 of the things that have happened over the years have
3 been somewhat embryonic in the early days and
4 developing over the later years, and I believe that was
5 pretty well the point I made in the overview of the
6 program I gave back in August of last year.

7 The dose reconstruction study encompassed taking a
8 sample of 99 dose reconstructions performed by Defense
9 Threat Reduction Agency and its predecessor agency,
10 Defense Nuclear Agency, mainly by its one contractor,
11 SAIC. Basically some of the issues the committee had
12 to deal with were basically three issues, and these
13 have been nagging issues over the life of the program:

14 Does dose reconstruction represent a valid process.
15 Second of all, how does that valid process help in
16 working with a compensation program, in this case run
17 by the Department of Veterans Affairs. And the third
18 most important issue that ties both our program and the
19 VA program together is is there sufficient benefit of
20 the doubt being exercised through this program that
21 gives the veteran the best chance for compensation.
22 And of course this report represents a very, very

1 comprehensive study if you read between the executive
2 summary and the beginning and the conclusions to the
3 end, a very in-depth look at every detail that goes on
4 during the course of our constructing doses.

5 The National Academy had four basic charges associated
6 with dose reconstruction, and then one charge of course
7 that applied to the entire program. I will summarize
8 the four basic charges that they had before them.

9 The first charge was are the doses accurate. And the
10 second charge is are the doses as they are reported to
11 the veterans and the Department of Veterans Affairs,
12 are they reported accurately. The third charge was are
13 the assumptions reasonable and credible with respect to
14 how we estimate the upper-bound doses. And the fourth
15 charge was are the data -- and when I say the data, are
16 the records and the historical reports robust enough in
17 terms of allowing dose reconstruction to be conducted
18 and to be conducted accurately.

19 So I'm going to hit each one of those very quickly as
20 regards what the Academy found. The first, are the
21 doses we reconstruct accurate. The basic finding was
22 the average value that we construct for our external

1 doses, while indeed they may be accurate and valid, the
2 upper-bound estimates that we provide for those doses
3 likely are not true upper bounds at the 95th
4 percentile. So it indicates that we have some room for
5 improvement there.

6 As regards internal dose, it said that for the most
7 part the doses that we estimate for inhalation to
8 organs, in some cases and many cases are representative
9 upper-bound estimates. However, it did mention a few
10 scenarios where the upper-bound estimates that we
11 provide for inhalation doses are perhaps severely
12 underestimated. And they specified the particular
13 instance of where we construct doses for areas where
14 fallout that's already been deposited on the ground
15 from a previous test is impacted by shock wave of a
16 current test in that we don't fully account for all of
17 the resuspension of the previously-deposited fallout in
18 those instances. And of course they don't affect a
19 large group of people, but nevertheless it's enough
20 that we need to go back and relook at doses we
21 constructed -- internal doses for those populations, or
22 subpopulations.

1 It also said, internal doses, that we don't pay much
2 attention to performing ingestion doses. But the
3 perception there is that the ingestion doses do not
4 form a large part of the entire internal dose, and the
5 consequence of our not paying much attention is
6 probably not very consequential to the entire dose to
7 the veteran internally.

8 The next charge, are the doses reported accurately.
9 The answer is the doses we report to veterans and to
10 the Department of Veterans Affairs are indeed accurate.

11 However, they feel that -- the Academy feels that we
12 can do a better job in communicating the upper bound of
13 uncertainties, what does this exactly mean, and also
14 that the VA in turn can do a better job in
15 communicating what the actual risk from that radiation
16 really is in terms of inducing cancers and other
17 diseases.

18 The third charge, are the assumptions credible and
19 reasonable, and this is the area where we received
20 probably the most criticism, that a lot of the
21 assumptions we make for upper-bounding doses are not
22 credible and reasonable, and that's from two

1 standpoints. Scientifically we've not taken into
2 account a lot of the techniques that are available
3 today to do uncertainty analysis on the 95th percentile
4 value. We have focused over the years on providing a
5 good reasonable estimate -- accurate estimate on the
6 central tendency value, but we've not paid much
7 attention to the fact that 95th percentile values also
8 have distributions of uncertainty.

9 On the other hand, the non-scientific part of the
10 program, have we incorporated in every case over the
11 breadth of the program all that the veteran could give
12 to us in the way of personal anecdotes and information,
13 and we've not, to a great degree, done that
14 consistently across the life of the program. We do it
15 better today than we did back at the inception of the
16 program. Do we do it the best way possible in terms of
17 where we're going in the future? I think that's a
18 scenario where we can do even better still in terms of
19 making sure that we have consistent ways of
20 communicating with the veterans and gaining all the
21 information that they have as insights to the process.
22 And also what they did.

1 The fourth charge, are the data accurate and robust
2 enough to support dose reconstructions. The Academy
3 found that the reference sources are sufficient and
4 adequate to allow dose reconstructions to be derived
5 from available historical data. In fact, they
6 commented that data are rather -- rather extensive and
7 available to perform dose reconstruction.

8 Of course where does this go? One of the items I
9 believe I briefed to you in August of last year was
10 should the DTRA dose reconstruction program have an
11 oversight committee very much like the Energy workers
12 program. And that's the subject of the last charge the
13 committee had is did they find it appropriate that we
14 should have an oversight over the dose reconstruction
15 process, independent of the agency. And the answer
16 came back yes, and this is sort of where we are today
17 on the program, that makes it very much indicative that
18 we need to be involved in the type of business you're
19 doing because, rather than you having the lessons
20 learned from us, I think this is the point at which the
21 roles between the two programs are going to reverse and
22 that we're going to look to be doing very much the same

1 thing that the Energy workers program is doing to
2 actually improve our program.

3 Some of the comments we had is we have a plan of course
4 to put the recommendations into effect. We believe of
5 course that the Academy did a very, very thorough and
6 scholarly piece of work in investigating our program,
7 and some of the suggestions in there -- or all the
8 suggestions are excellent suggestions that will help us
9 make the program better. And of course the very most
10 important thing with implementing this particular --
11 recommendations of this report is we need to be able to
12 do the best job we can for our veterans who were
13 exposed during the atomic test era and the post-war
14 occupation of Hiroshima and Nagasaki. And we believe
15 that this particular study will take a 20-year-old
16 program and push us into the future, should there be
17 means to allow us to continue this program.

18 I'll take any questions.

19 **DR. ZIEMER:** Thank you very much. Let me comment
20 before we have questions, and that -- the comments are
21 as follows: First of all, this item was added to the
22 agenda very late, as many of you know, and the reason

1 was that the report just came out. And it's our hope
2 that we can have a more in-depth time to focus on this
3 report, perhaps even at our next meeting, and perhaps
4 invite the Chairman of the Academy committee, who I
5 believe was John Till -- or else one of his colleagues
6 -- to address the group and go into the report in
7 depth. Since it's a report of an Academy committee,
8 that might be worthwhile.

9 It probably would be inappropriate for us to put Mike
10 on the spot and ask him to go into any depth today in
11 terms of our questioning. I think I would just like to
12 limit the questions -- one or two brief questions if
13 you have them, and then we're going to move on to our
14 next topic. But we do appreciate at least giving us
15 this initial glimpse of the nature of the report. It
16 has I think the -- certainly the recommendations that
17 the committee made are very pertinent I think to us as
18 well to look at what they recommended for that program
19 and see what kind of parallels we might have with our
20 own program here in terms of the oversight, monitoring
21 issue, quality control issues, that kind of thing --
22 and communication with the claimants and so forth.

1 But we have several questions again. Please keep them
2 brief and let's not try to get into depth on this
3 report today. Okay, Gen -- we'll just go down --
4 around the table here.

5 **DR. ROESSLER:** Mine is not a question but a comment,
6 and I think it's lessons learned for us from this
7 report and I think we really ought to study it in some
8 detail because there are a lot of them. My impression
9 when I read the comments, the deficiencies, is that
10 this program already has taken -- you know, is doing
11 these things, has -- has learned from it. But I think
12 the thing that impressed me as the committee looked at
13 the data and talked about quality control, illegible
14 data, lack of standard operating procedures, and I
15 think that this -- certainly in this program is in
16 effect. But we as the Board should make sure that we
17 continue to monitor, especially I think the standard
18 operating procedures.

19 **DR. ZIEMER:** Thank you.

20 **DR. MELIUS:** Yeah. Yeah, I thank Larry for putting
21 this on. I was the one that requested it -- short
22 notice -- and others may have, also, but appreciate

1 that. And also, just to echo Gen's, I think it's --
2 there are things that are underway here that sort of
3 obviate some of the potential problems in the program,
4 but one thing I have trouble with the report was --
5 from the executive summary and what we've heard about
6 it is sort of what were the more important findings?
7 It's a typical Academy report in that we've found a
8 problem here, then usually later in the paragraph it's
9 buried in saying but it really wasn't that important,
10 you know. And it's very hard to judge, of all the
11 different sort of potential problems they found, what
12 were the more -- you know, most significant, at least
13 from your perspective in trying to address, and then I
14 have a follow-up question.

15 **MR. SCHAEFFER:** I think the most significant, and Gen
16 touched on it very briefly, that I think underlies the
17 entire program in terms of moving it forward is you
18 look at the life of the program over the last 25 years,
19 there's been various forms of two-way procedures. Of
20 course better now than they were back then. Likewise,
21 SOP, now much better than of course back when we
22 started the program, where admittedly some of these

1 procedures were lacking. And I think the way forward
2 here is of course the science and the art of developing
3 QC procedures and SOP of course have evolved over the
4 years, and this is where we need to get back into the
5 queue and actually start developing what are those more
6 extensive procedures that you see at DOE establishments
7 or that you see the U.S. Navy Nuclear Propulsion
8 program use in conducting their work. So there's all
9 sorts of paradigms that we can draw on today that I
10 think would be most important for us to embrace in
11 their entirety, but this is an area where, number one,
12 I think we need to concentrate a lot of effort. It's
13 also one where we can also institute actions right
14 away, so that provides a good opportunity.

15 Let's see, what's the second issue you brought up?

16 **DR. MELIUS:** Yeah, just one -- I don't know if you have
17 any preliminary thoughts. One of the recommendations
18 and findings that struck me was this issue of how you
19 take into account the veterans', you know, personal
20 recollections and information they provide and how to
21 you systematize that into the -- your follow-up and
22 provide the documentation on that. Any thoughts on how

1 -- I know that's sort of a moving target, but any
2 thoughts on sort of where you will go with that
3 particular issue?

4 **MR. SCHAEFFER:** That of course represents the next
5 equally important area. I think there's three issues
6 that are important. The first we just talked -- first
7 two we talked about. This is an area where we've not
8 been consistent in our practices over the years.
9 Again, the Academy report was written in the vein that
10 they took the look back to 1983 on some of these doses,
11 clear up to 2001. And given the fact that there's
12 better degrees of performance here as time marches
13 onward. But one of the areas I believe we can do even
14 a better job is talking to the veterans, taking into
15 consideration what they say. And this is a very, very
16 big gray area in terms of our having to work probably
17 in a closer partnership with the Department of Veterans
18 Affairs. It's very, very important -- very, very
19 important that we get the veteran's statement up front
20 in this process. And not only is it important that we
21 just get a written statement, that we also have the
22 opportunity to be able to go back and talk to the

1 veteran about that statement, get into a dialogue up
2 front in our process before we even pick up and do a
3 dose reconstruction. Although we're doing many of
4 these things today, we need to probably do them even
5 greater emphasis. And I would say part and parcel with
6 the QA procedures and SOP, we need to develop exactly
7 what are those processes we -- that we're going to do
8 to extract every last bit of information we possibly
9 can from the veteran.

10 The second area that goes along with that, again, are
11 assumptions always valid. I think we need to do
12 something very similar that is done in the NIOSH
13 program in that we need to sit down and spell out the
14 basic assumptions prior to our doing any mathematics to
15 assign a dose to the person, either from available
16 dosimetry or other radiological data, which the Academy
17 of course found -- finds is very robust in terms of
18 being able to allow us to do the process. So we need
19 to knit those two parts together very, very intimately
20 much better, and I think even in terms of eliciting a
21 response from the veteran is -- this is what we've got,
22 will you shake hands with this so we can move forward

1 with the dose -- realizing again that's going to be a
2 very, very precarious process in that some people, no
3 matter what we do, no matter how well we make
4 assumptions in their favor, may not agree with them.

5 **DR. ZIEMER:** A comment here and then we'll go on --

6 **MR. ELLIOTT:** Can I go first? Just for the benefit of
7 the public that's here today, this is a pre-publication
8 copy. We've provided the Board with the executive
9 summary and the title page. The public can go to the
10 web site, www.map.edu, and they'll find this report as
11 a pre-publication copy. Once the hard copies are
12 available, we'll solicit interest from the Board
13 members and purchase you a copy for reference, for your
14 benefit.

15 **DR. ZIEMER:** All right. Thank you for that comment.
16 This is not a NIOSH document that we can make available
17 to the public. It's not a government document, so --
18 but it is available on the web site if people want to
19 read it.

20 Okay, Mark and then Tony.

21 **MR. GRIFFON:** Yeah, I think a couple of my questions
22 were actually captured, and I had several, but I will,

1 as Paul suggested, save some of the more detailed ones.
2 One thing I wanted to ask about, there's a reference
3 further in the report -- page 127 they talk about the
4 exposure profiles and they -- there's a conclusion that
5 20 of 99 of these exposure profiles were found to be --
6 have inadequacies, I think is the phrase -- I'm
7 paraphrasing. And yet the overall conclusion, as you
8 stated, in the executive summary is that the data was
9 overall adequate. Is that consistent or am I -- am I
10 misreading that? The exposure profiles I believe were
11 used for the individual dose reconstructions.

12 **MR. SCHAEFFER:** I think the basic conclusion the
13 Academy made is sound, based on the examination they
14 made. We'll admit to you that if you don't read it
15 from cover to cover and digest every scientific detail,
16 you'll probably lose the flavor with actually how it
17 relates to the overall recommendation or conclusion.
18 So I would not say based on the 20 that you looked at
19 that necessarily they were full-blown inadequacies.
20 There were probably lots of gray areas.

21 **MR. GRIFFON:** I gue-- the reason I'm reflecting on the
22 exposure profiles is because of the working group's

1 efforts here, too. I just want to find out, from our
2 perspective, what we need to build into our system.
3 But do you recall why -- and maybe this is putting you
4 on the spot too much for the detail, but why there were
5 so many inadequacies in those exposure profiles and are
6 -- is anything -- have you reflected on ways to change
7 that or has that been maybe modified already, how you
8 do yours --

9 **MR. SCHAEFFER:** I believe that that's going to be taken
10 up into the holistic approach we take to correct QC,
11 QA, SOP, talking to the veterans. I think that that's
12 very, very important that when we do upper-bound
13 uncertainties, for instance, it's not just a scientific
14 value, it's a part of -- considering all the data from
15 the veteran, if the veteran says he's within 100 yards
16 of ground zero but there are no available historical
17 reports that puts the veteran no closer than 500, then
18 we have to hold out the possibility and provide the
19 Department of Veterans Affairs an answer that goes
20 right with the veteran's statement and leave it to the
21 VA, of course, to make the judgment in terms of all of
22 the -- the available data as to whether weight is given

1 to an upper-bound estimate at 100 yards versus 500.
2 And I think in the past we may have tried to enter
3 ourselves into that judgment process more than probably
4 we needed to. Again, this takes a lot of work and
5 collaboration with understanding what the goals and
6 objectives the Department of Veterans Affairs has and
7 what are their considerations in making decisions.

8 **MR. GRIFFON:** Just one last follow-up on that. From
9 what I understand, you didn't have a interview process
10 for the claimants?

11 **MR. SCHAEFFER:** No, we do have an interview process.

12 **MR. GRIFFON:** You do have an interview process.

13 **MR. SCHAEFFER:** But if you looked at it over the
14 entirety of the history of the program, there are
15 various stages of inconsistency in how we did this,
16 maybe less in the earlier days, more in the later days.

17 In terms of how we do it today, we wouldn't want -- of
18 course capture how we do it today, add a little more to
19 it than what we have, but the important part is to
20 develop a procedure by which we will do this in
21 somewhat of a uniform fashion.

22 **MR. GRIFFON:** And is it a scripted interview now -- I

1 mean now, what you have, is it a scripted interview
2 where you go through a set of standard questions with -
3 -

4 **MR. SCHAEFFER:** Give you an example of what we have, we
5 have a basic questionnaire that we elicit from the
6 veteran with basic name, address, where he lives, basic
7 information as to what shot he thought he was at, and
8 of course we send that back to the veteran and they
9 confirm it and mail it back to us. In terms of what we
10 did in the last eight years is we developed, in
11 cooperation with the VA, a more extensive questionnaire
12 that the VA can hand out to their claimants that we can
13 also use when we talk to the veteran to go through and
14 touch all the questions and elicit all the information.

15 Is it a scripted interview by the type that you're
16 talking about, much like NIOSH does? Not quite like
17 that, but we do have a standard questionnaire.

18 **MR. GRIFFON:** Yeah, I actu-- the reason I brought it up
19 was some of the accounts in the report -- I guess those
20 were letters, maybe unsolicited letters from the
21 claimants describing what incidents they were involved
22 in and they have very in-depth descriptions of what

1 they did during those -- the tests, I guess.

2 **MR. SCHAEFFER:** Right.

3 **MR. GRIFFON:** And the -- I don't know if you couch it
4 as in your current pro-- do you try to capture sort of
5 work his-- you know, work history that way or do you
6 ask them, I don't know -- I was just curious if you had
7 a sort of standard set of, you know, questions along
8 processes and potential exposures now or if it was more
9 open-ended questioning --

10 **MR. SCHAEFFER:** Actually it's pretty specific. If you
11 looked at the form that's in the VA workbook, as well
12 as in our program, it's not only specific to what they
13 did, it's specific to the types of test, whether they
14 were on the test site, whether they were in the
15 Pacific, whether they were in Hiroshima or Nagasaki,
16 the forms are -- have different sectors that are
17 peculiar to the differences in the types of testing.

18 **MR. GRIFFON:** That's what I was getting at. Thank you.

19 **DR. ANDRADE:** A quick comment and a quick request. I
20 don't want to put you on the spot right now and
21 hopefully when you report back it'll be interesting.
22 Having come from a place that has recently been

1 accosted by the GAO, I know that they tend to make rash
2 accusations based on little data. Two of them really
3 strike me as completely frivolous. One is how in the
4 world do they have the scientific bases to predict or
5 to tell you that your beta to gamma factors are off by
6 a factor of two or three? Same with the neutron to
7 gamma factors. Okay? That means they must know a
8 whole heck of a lot more about your study than
9 yourselves. Nevertheless, I appreciate the program
10 that you all are going to put together to try and
11 address some of these issues, but I would really like
12 to know what sort of basis they have stated to make
13 these kinds of accusations. And not until the veterans
14 are indeed interviewed, talked with -- their commanders
15 interviewed, et cetera -- will anybody really have a
16 clear picture as to what really happened out here.

17 **MR. SCHAEFFER:** Let me address your questions there
18 'cause I think both of those issues kind of stand apart
19 from the program and where the current body of
20 knowledge is. Let's take for instance neutron quality
21 factor. It didn't say we failed to use a neutron
22 quality factor. What it said we didn't do is, in the

1 upper-bound estimate of a neutron dose, take into
2 account the body of knowledge as we know it today,
3 reflecting the uncertainty on the quality factor. And
4 I believe Dr. Kocher addressed that very well today as
5 to what that truly means in terms of application to our
6 program. Let's say we apply a quality factor of ten,
7 we don't put in the upper-bound estimate that could
8 have -- be as high as 20 and as low as five. Similarly
9 for the skin dose factor that goes hand in hand with
10 the fact that the skin dose is based -- part of that
11 external exposure to the skin is based on the upper
12 bound of the gamma estimate. And one of the areas of
13 the report indicated that our upper bounds are
14 somewhere on the order of 1.2 to 1.5, for instance -- I
15 hope I'm quoting that correctly -- and the dose should
16 be perhaps along the order of magnitude of two to
17 three. Put that in the context in the fact that we use
18 the upper-bound estimate to come up with the skin dose.
19 That's where that particular comment is being
20 addressed, as well as of course any uncertainties in
21 the quality factor.

22 **DR. ZIEMER:** Okay. Thank you very much. We appreciate

1 this early review of the report, and we'll look forward
2 to hearing more on it later.

3 **BOARD DISCUSSION/WORKING SESSION**

4 **REVIEW PROCESS OF COMPLETED DOSE RECONSTRUCTIONS**

5 Now we're going to move our attention to the dose
6 reconstruction work group again, Mark. We do want to
7 only go till 4:15 on this, so you want to pick up where
8 you left off this morning or -- or is there enough time
9 for you to do -- I can -- we can move the public
10 comment period up if you'd rather not -- can you get
11 enough done in 20 minutes to make it worth doing this
12 afternoon?

13 **MR. GRIFFON:** No.

14 **DR. ZIEMER:** Okay, and then we'll defer your things
15 until tomorrow then -- 'cause we have a session
16 tomorrow. You have more to cover than you could in 20
17 minutes and you have handouts that will come tomorrow.

18 **MR. GRIFFON:** I'll have handouts tomorrow morning.
19 It'll be easier for people to look at something.

20 **DR. ZIEMER:** Okay. Then we will ask for the ledger of
21 public comment participants. Just a moment here.

22 (Pause)

1 **MR. ELLIOTT:** Pardon me?
2 **MR. MILLER:** Is it on the web site, did you say?
3 **DR. ZIEMER:** I don't know if it's on the web site yet.
4 **MR. ELLIOTT:** Is that the Board's letter?
5 **MR. MILLER:** The Board's letter, yeah.
6 **MR. ELLIOTT:** To Secretary Thompson --
7 **MR. MILLER:** Yes, Secretary Thompson --
8 **MR. MILLER:** Yes.
9 **MR. ELLIOTT:** I believe it's on the web site.
10 **MR. MILLER:** As of when? Okay. All right, we'll look
11 again. Okay. Well, I think what you agreed upon was
12 that the statutory intent of Congress was to -- that
13 the 22 listed cancers was in fact a fixed list and
14 whatever -- whatever caveats you had, you at least --
15 it appeared from what I heard and the rumor mill that
16 this was the view that the Board had reached as a
17 consensus, and if that was the case, I hope that NIOSH
18 takes that and HHS takes that to heart.
19 I would just like to reflect on something that Dr.
20 Melius had raised, which was with respect to the
21 incorporation of worker studies. And if I understood
22 the response, at least from Mr. Elliott was we'll take

1 up the question of worker studies after BEIR VII. And
2 if that's right and if BEIR VII is say two years from
3 now or a year and a half from now, we're looking at
4 five years after the statute's been enacted before
5 NIOSH begins to look at worker studies in its
6 compensation model. And I just wanted to reflect and
7 remind that the statute, in terms of setting the
8 guidelines -- which is your IREP model -- requires that
9 you at least take into consideration information on the
10 risk of developing radiation-related cancers on work
11 place exposures, and I know you all are familiar with
12 it, but it just sort of struck me sitting there, we're
13 going to have to wait five years to deal with that
14 question. Seems to be a long time, and I thought Owen
15 Hoffman's suggestion was really quite constructive,
16 which is there's -- there are a number of studies out
17 there which have come to multiple conclusions, and I'm
18 not talking about a single study, but multiple studies
19 that have raised questions, for example, as we've
20 discussed in the past, age at exposure. Is the slope
21 positive or negative with respect to age at exposure,
22 and -- and the IREP model in some cases is linear and

1 in some cases it assumes that people are less
2 radiosensitive the older they get. And -- and yet
3 there are four or five studies out there now by three
4 different authors, some of which were funded by NIOSH
5 from the HERB branch, which seem to indicate well,
6 there's a lot of uncertainty in this area, that -- that
7 what we learned about the atomic bomb survivors and
8 what we learned about workers are very different, that
9 you have a positive -- you may have a negative slope,
10 not a positive slope. And if that's the case, is there
11 a way that, you know, SENES or others can propose ways
12 in which those studies, where there are multiple
13 studies -- not a single study but where there are
14 multiple studies that seem to confirm that point, and
15 it's a worker study -- that that can be accommodated
16 sooner rather than later, because the effect, for
17 example, on age at exposure is so stark. And yet we've
18 got studies out there which seem to cast significant
19 findings on worker studies that are different than
20 those who were atomic bomb survivors, and we know a lot
21 of the issues that came up with the atomic bomb
22 survivors that may explain why you have a different

1 result for worker studies than you have from atomic
2 bomb survivors such as the healthy survivor effect.
3 But I would just like to propose at least for the Board
4 to think about grappling with this sooner than waiting
5 for BEIR VII, 'cause it seems like that's a long time
6 to wait subsequent to enactment.

7 The second question I guess I would be interested to
8 hear about would be the -- the weight of evidence
9 around chronic lymphocytic leukemia. The only reason I
10 guess this sort of keeps coming to my attention was --
11 was -- 'cause I keep getting all these letters from
12 claimants who FAX them to me at home and say -- from
13 the Department of Labor that says Dear So-and-so, The
14 probability of causation from chronic lymphocytic
15 leukemia is zero.

16 So, you know, curious about the CLL debate and going
17 back to BEIR V, what we discover is that the
18 statistical question before BEIR V was do we have
19 enough cancers that are in excess of what was expected
20 for that population, and there were two CLL cases
21 identified in the life span study for mortality, and
22 there was an expectation of 2.83 deaths from CLL. Now

1 I don't know if that's a statistically stable estimate,
2 but I don't think it looks that way to me. It looks
3 like a very unstable estimate, and there are a number
4 of questions about the misclassification of CLL as it
5 is. I mean, you know, hematologists and others will
6 tell you it's easy to misclassify it for a number of
7 reasons. And there are a number of others who have
8 written on this subject extensively about how to treat
9 all of the leukemias, and so I would just like to ask
10 the Board to -- and maybe NIOSH -- to think about
11 whether or not it is worth opening the inquiry, because
12 I don't know that it's sustainable to say -- I don't
13 know that it's defensible to say there's a zero percent
14 probability of causation from any radiation exposure.
15 Now in Germany just recently a court in northern
16 Germany found, based on the work of Wolfgang Hoffman,
17 who I've now learned is not related to Owen Hoffman, is
18 -- has -- has -- has developed an extensive review both
19 of literature and -- at the cellular level and
20 epidemiologic level to indicate that in fact -- this
21 was in a particular case involving an individual who
22 had up to 400 rem -- was an X-ray technician -- that

1 this was a work-related radiation-related injury. Now
2 if that's the case, and granted, it is merely a court
3 decision and -- and -- and it was not -- but was based
4 on, you know, the scientific weight that was brought to
5 the table in that case, is this something worth opening
6 up and looking at at this point, or is it a matter
7 where the book is closed because it was closed in BEIR
8 V or because Charles Land says it's not going to go
9 into IREP? And I would just urge you all to think
10 about that question and add it perhaps to that lengthy
11 list of to-do's.

12 Those are my comments. Thank you very much. And I
13 want to also compliment the NIOSH and their staff for
14 putting together a terrific meeting in terms of
15 information, the wealth of individuals you brought
16 here, so thank you very much.

17 **DR. ZIEMER:** Thank you, Richard, for your comments.
18 Let me ask if any of the Board members have questions
19 to ask of Richard? There appear to be none. Thank
20 you.

21 Next we'll hear from Denise Brock, who represents
22 United Weapons Workers and Denise is with us from St.

1 Louis.

2 **MS. BROCK:** Hi, and I ask everybody to bear with me. I
3 took notes while I was sitting here so I'll be
4 shuffling and reading at the same time. It does not go
5 in really good order. And for the record, my name is
6 Denise Brock, and I do represent the United Nuclear
7 Weapons Workers of the St. Louis region. I am here on
8 behalf of all of Missouri Mallinckrodt workers. My
9 mother is one of those claimants. I think the Board
10 has met her. She is 80 years old and, for the record,
11 she has had her phone interview in December and is
12 still waiting dose reconstruction.

13 Today I do have some comments to make, as well as some
14 questions to be raised. First of all, I would like to
15 state that this is just not about science. It is also
16 about sick workers, dying workers, and the survivors of
17 deceased workers. And in some cases it is also about
18 incomplete science, things like -- or for example,
19 Mallinckrodt. I would like to give just a brief time
20 line -- there is a method to my madness.

21 In April, 1942 Dr. Arthur Compton, a physicist from
22 Washington University, met with Edward Mallinckrodt,

1 Jr. to ask if Mallinckrodt would sign onto a top secret
2 project purifying uranium for making the atomic bomb.
3 Mallinckrodt agreed, and Mallinckrodt thus steps into
4 the forefront of the Manhattan Engineering District,
5 later known as the Manhattan Project.

6 Here we go with the paper shuffling. One of the first
7 goals of the Manhattan Project was to build an atomic
8 pile to see if the theoretical chain reaction would
9 actually work. The scientists figured that they would
10 need 40 tons of uranium oxide and six tons of uranium
11 metal, along with graphite, to build the pile. By
12 July, 1942 Mallinckrodt Chemical in downtown St. Louis
13 was producing a ton of pure uranium oxide a day. The
14 magnitude, scope and danger of this effort was
15 unparalleled. Using the highest grade uranium ore,
16 known as Belgian Congo pitchblende, allowed the Project
17 to proceed quickly. The government's ambitious efforts
18 to build this atomic pile or atomic weapons supply
19 later took some of the very lives they were intending
20 to save.

21 For 24 years Mallinckrodt used 3,300 employees to
22 produce more than 100,000 tons of purified uranium

1 metals -- or materials. At the outset Mallinckrodt was
2 concerned about explosions from the ether used in the
3 purification process. I understand that in Plant 4
4 they were using this to make pure uranyl nitrate.
5 The early absence of knowledge about the dangers of
6 radiation led to some very cavalier approaches to the
7 management of radioactive waste, not to mention the way
8 in which Mallinckrodt workers handled these substances.

9 For example, when they were handling this Belgian
10 Congo pitchblende, the workers would take it off rail
11 cars into the plant for processing with little
12 protection other than cotton respirators and cotton
13 work clothing.

14 July of 1942 Mallinckrodt is producing a ton of pure
15 uranium daily, but workers are told that they're
16 working with uranium oxide SL42-17. Code names like
17 green salt, tube alloy, biscuit, juice, oats, cocoa and
18 vitamin were given to the various processes, and no one
19 was to say uranium. It was top secret. No one really
20 knew what they were working with.

21 And somewhere between 1943 and '45, workers were told
22 that they were performing a patriotic duty. The

1 Federal government built three cities for secret bomb-
2 making -- Oak Ridge, Tennessee; Hanford, Washington;
3 Los Alamos, New Mexico. In less than two years
4 Mallinckrodt sends materials to all of them, and this
5 is just a timeline of part of that.

6 And back to the workers, I must reiterate what I've
7 said in previous meetings. Claimants get letters
8 stating that it could be months or years before dose
9 reconstruction is completed on their claims. These
10 people do not have months or years. They are dying. I
11 have workers that have cancers that have come back. I
12 have workers -- claimants that have died while waiting
13 for this -- to get finished with their dose
14 reconstruction.

15 Most recently there has been an influx of Mallinckrodt
16 claimants getting ready to have their phone interviews.

17 This on one hand is a positive thing; it shows
18 movement. But the unfortunate thing is these claimants
19 are being sent questionnaires that they claim they
20 cannot possibly answer, for several reasons. One was
21 what I previously stated. These workers weren't told
22 what they were working with. They were -- I say lied

1 to while they were being poisoned. They weren't
2 monitored for all radionuclides or isotopes. And then
3 you're looking at survivors of these workers. When the
4 workers maybe that actually had an idea what they were
5 working with were told to keep it secret and they took
6 those secrets to their grave, this leaves the
7 survivors. You're talking about 70 to 80-year-old
8 people having to know things like this. It's almost
9 impossible. I have claimants, survivors, women calling
10 me crying or coming to my house saying I'm never going
11 to get paid, this is a hoax, this is ridiculous, I'm
12 just going to give up. I've got people that have
13 cancer that are having to have \$1,800 shots. I've got
14 a mother that can't afford her medicine. She's had a
15 quadruple bypass, and it's not an anomaly. These
16 people are sick and are waiting for this to be
17 expedited, and it's not happening. And I don't think
18 it's on purpose. I don't think it's with malice or
19 forethought (sic), but it is the truth. It just -- it
20 seems like it's stagnating or laying somewhere.
21 I've got workers that are living that are sent
22 questionnaires that are -- it's actually I think page

1 four, I believe, on the questionnaire, and it actually
2 says on there which radionuclides were you exposed to,
3 things like tritium, cobalt, actinium, protactinium,
4 polonium. These workers don't know what that is. Next
5 -- and then it says you can answer yes, no, don't know.
6 All respect to Dr. Toohey, he's wonderful. I did call
7 him. I had two claimants actually at my house, two
8 older men that are very sick, just on the verge of
9 tears saying I have no idea what this is. I don't
10 know. I wasn't told. So I talked to Dr. Toohey and of
11 course Dr. Toohey said they can say no or don't know,
12 and obviously they're concerned if they do that, that
13 somehow is going to have a negative effect on their
14 dose reconstruction. That, too, would be my concern.
15 Then you've got something next to it that says isotope.
16 They don't know what an isotope is, and then it says
17 solid, liquid or gas. And my question to Dr. Toohey
18 was, if this stuff concentrated, we don't know if or
19 where, could that form change? I mean this is an awful
20 lot for these 70 and 80-year-old sick workers or
21 survivors of such to know.
22 So what I did was I researched what radionuclides went

1 with what facilities, and I put a key there because we
2 have three Mallinckrodt facilities. And there wasn't
3 enough room, so I made my own paper, then I got the
4 isotopes and I filled all that out and I called a
5 meeting for those that were getting ready to have their
6 interview and I gave that to them so whoever interviews
7 these people will be prepared because these people do
8 know now what they were exposed to that they didn't
9 know then.

10 And my question, too -- I do have a question. Some of
11 the claimants have, as well. Once that phone
12 interview's done -- like I said, my mother had hers in
13 December -- the question would be I guess is there a
14 site profile completed on Mallinckrodt yet? Is that --
15 is that finished, completed?

16 **MR. ELLIOTT:** No, it's not completed. It is being
17 worked on.

18 **MS. BROCK:** Being worked on. I understand, but I guess
19 my confusion here is if there's limited to incomplete
20 individual data -- for example, I filed a FOIA request
21 on my father on behalf of my mother, and I got a call
22 from the Department of Energy stating that they did not

1 have the records or access to such, would I like to
2 withdraw my FOIA? I said absolutely not. If you don't
3 have it, then you put it in writing. I'll take it to
4 my senator.

5 Well, then I get a letter in the mail -- actually, I'm
6 sorry. Then I understand that they said by not having
7 access, the Department of Energy did not own those
8 records, the vendor did, and I believe there's a
9 statute that says that DOE is to go to that vendor.
10 Well, we have a problem there because Mallinckrodt was
11 bought out by Tyco*. We have all sorts of problems.
12 Make a long story short, I get something back from the
13 Department of Energy stating my dad was under Q
14 clearance and they've destroyed his records. This
15 again is not an anomaly. My concern here is if you've
16 got workers and their records are destroyed and they've
17 had multiple job titles, multiple exposures, how are
18 you going to dose reconstruct them? I have grave
19 concerns. I'd like -- I've said this in the past about
20 using coworker data. I have workers telling me badges
21 were laundered. I have no idea what that means. And
22 if you're basing this on site information, we had

1 actinium, protactinium. I recently found out we even
2 had beryllium. I mean if -- if the health physicists
3 are aware of this, why are you asking the workers when
4 they have no way of knowing this?

5 **DR. NETON:** I'd just like to maybe clarify a little
6 bit. The purpose of the questionnaire is really not to
7 have the claimant provide a detailed response to us,
8 although that would be certainly beneficial to us. But
9 it's really just to get the record -- a complete
10 record. We felt that it's very important for the
11 claimant to be able to represent what they felt they
12 were exposed to or what they were exposed to, so we
13 could compare that to the record that's in the
14 Department -- the Department of Energy provides. In no
15 way is -- are we relying solely on the claimant's
16 response to the questionnaire to complete a dose
17 reconstruction.

18 **MS. BROCK:** The next thing I wanted to say was that I
19 understand Mallinckrodt produced a residue containing
20 radium in the process of recovering uranium from the
21 Belgian Congo ore. This residue was known as K-65
22 residue. In 1949 about 200 pounds of this residue was

1 shipped to Mound, Ohio. Eighty drums of rather
2 inhomogeneous material was supplied by Mallinckrodt
3 known as Sperry presscake, which consisted of a matrix
4 of iron, protactinium, aluminum, calcium, magnesium,
5 cobalt and copper. Kotter* Company also received
6 100,000 tons of material from St. Louis, possibly
7 tailings in the '60's and '70's. These were from the
8 Belgian Congo processing. During the Dodge v. Kotter
9 trial a deposition was taken of a Kotter manager where
10 he admitted that materials from St. Louis had plutonium
11 in them. I'm assuming that must have been -- because
12 I've recently researched and found it was PU-244. I'm
13 not a scientist or health physicist, so I hope that's
14 correct. I understand that's a natural-occurring
15 plutonium, and I understand that maybe there was a
16 criticality underground in Africa that could have
17 caused that. I'm not quite sure if that's correct.
18 I would also publicly like to state again -- and please
19 don't anyone take this personally, but I just feel that
20 Mallinckrodt should be a Special Exposure Cohort,
21 especially if there are only two criteria needed to
22 meet that. Number one, that the workers were

1 endangered. I think that's a given. And number two,
2 that NIOSH cannot dose reconstruct with sufficient
3 accuracy. And Senator Bond, which is a senator in
4 Missouri, will actually be flying in his DC Labor
5 person on the 27th to talk to me about that I've
6 briefed their office once, and I am hoping with
7 everything I have that -- that this goes through
8 because, to me, these workers are dying. It would be
9 the quickest way -- it would expedite this. But beyond
10 that, they were exposed to things they were never
11 monitored for. And unless Larry wants to tell me he
12 can go ahead and just slap a 150 to all of them, I just
13 think that would be the best way for me to do that.
14 I just have a couple of questions if you -- am I taking
15 too long?

16 **DR. ZIEMER:** You're okay, Denise.

17 **MS. BROCK:** Okay. Dr. Neton said that the site profile
18 was not finished yet. Could you tell the Mallinckrodt
19 workers, do you have any idea -- how long do you think
20 it will be before the site profile is done or what else
21 -- I understand you're getting ready to go to SLU, or
22 St. Louis University, and then possibly to Georgia to

1 collect more evidence or more information or data. Do
2 you have any idea how long it will take to finish this
3 profile before you can start dosing these workers?

4 **DR. NETON:** I think the site profile has been started
5 on Mallinckrodt. I know it's been started -- I would --
6 -- I can't give you an exact time frame, but I would say
7 it's a matter of months, in the next several months
8 it's on the agenda to be finished. We had recently
9 completed a data capture effort at the DOE Germantown
10 office where we found boxes of Mallinckrodt monitoring
11 records that we're going through and assembling. As
12 you know, ORAU -- Mallinckrodt has also been studied
13 extensively by ORAU, our contractor, in previous
14 epidemiological studies, so there exists a large volume
15 of records there. So the short answer is that there --
16 there's a tremendous amount of -- a large amount of
17 information available at Mallinckrodt that we need to
18 review to develop the site profile. And it in general
19 is to the claimant's benefit that we do that so that we
20 can make sure that the doses that we assign are
21 accurate, and in fact that we do contribute a missing
22 dose to their records that may have not been captured

1 in the monitoring program. But it will be a matter of
2 several months before it's completed.

3 **MS. BROCK:** And I agree. I mean I would hate to see a
4 site profile rushed through. I mean you want to make
5 sure that it's not incomplete, that there are things
6 there. But my concern, too, is if there are things
7 that these workers are not monitored for, such as the
8 actinium and protactinium, we've got three types of
9 radium, three types of radon gas, just enormous amount
10 of things. I know that you say you can use site
11 information to dose these workers, and maybe use a
12 worst case estimate. How do you keep from
13 underestimating that worst case? Maybe I'm just
14 confused, but I don't understand how you do that.

15 **DR. NETON:** Okay, it has to do with the uncertainty
16 distribution, which we've seen a lot of evidence
17 discussed today with Dr. Kocher's presentation, but
18 it's similar to that -- to that process. We take a
19 look at the available evidence related to the
20 monitoring information, and if there is no monitoring
21 information on the workers, we'll look at the air
22 sampling information. And using that, we'll take a --

1 we'll make a best estimate, a best judgment of what the
2 most likely exposure scenario was in the work plant.
3 But then we will assign a distribution of values about
4 that. And in sampling for the probability of
5 causation, when it's run through -- we'll assign that
6 distribution about the central estimate, and then when
7 the Department of Labor runs the probability of
8 causation calculation, it will use that distribution of
9 all possible exposures to come up with the probability
10 of causation. So it's sort of built into the model.

11 **MS. BROCK:** Hypothetically speaking, if I would get
12 this SEC to go through, what happens if claims are
13 actually dose reconstructed and denied? Is there a
14 possibility that I could help those people that have
15 been denied? Can they later go into the Special
16 Exposure Cohort? Is that a possibility?

17 **DR. NETON:** The rule makes a provision for any time new
18 information comes forward, it provide -- either
19 discovered by NIOSH or provided by the claimant, Labor
20 can reopen the claim and re-evaluate it at that time.
21 So that's a definite possibility and that's provided
22 for.

1 As far as once the claim has been denied and then being
2 moved over to the Special Exposure Cohort, I'm not
3 sure. Maybe Ted Katz could shed some light on that
4 issue.

5 **MR. KATZ:** I mean if -- if they're denied it through
6 dose reconstruction and then they're added to the
7 Special Exposure Cohort, there's a lot of steps in
8 between that that would explain that, but certainly if
9 they're added to the Special Exposure Cohort, then they
10 would be compensable claims under the provisions of
11 that cohort, yes.

12 **MS. BROCK:** I only have like three more questions,
13 sorry.

14 The 22 cancers, I understand there's only 22 cancers in
15 the Special Exposure Cohort. I do have numerous people
16 with prostate cancer, skin cancer. If the Special
17 Exposure Cohort goes through and you're saying dose
18 reconstruction cannot be done with sufficient accuracy,
19 those people fall through the cracks or are they dose
20 reconstructed?

21 **MR. ELLIOTT:** We are doing dose reconstructions on
22 prostate, skin, for the current SEC cohort members.

1 These folks that you've identified for future classes
2 to be added to the cohort would then be without remedy
3 at that point because we would be in a position where
4 we've said we could not do dose reconstruction for that
5 class.

6 **MS. BROCK:** Are you saying that prostate and skin are
7 part of the 22 cancers? Did I misunderstand that?

8 **MR. ELLIOTT:** No, no.

9 **MS. BROCK:** No.

10 **MR. ELLIOTT:** I'm saying that currently we are doing
11 dose reconstructions for members of the Special
12 Exposure Cohort who present with prostate, skin and
13 other cancers not of the 22. Now that's what's going
14 on now.

15 Once the rule -- our rule on Special Exposure Cohort
16 classes is in place and we add a class to the Special
17 Exposure Cohort, that is under the premise that we
18 can't do dose reconstruction. So unfortunately, at
19 this point, those folks who present with a cancer not
20 on the list of 22 would be without remedy.

21 **MS. BROCK:** Okay, thanks. Now this sort of has to do
22 with the Special Exposure Cohort, too, I guess, and not

1 to beat a dead horse because I've brought this up
2 before, but we had talked about this smoking. And I
3 noticed today that one thing that wasn't mentioned was
4 a former smoker, and I understand that RECA actually
5 removes the smoking in 2000, so I just think -- I'm
6 confused. Isn't it merely to be a consideration? I
7 know with smoking it's an automatic pay in the SEC, so
8 I'm wondering again if you've got two workers side by
9 side, they both present lung cancer, one's a smoker,
10 one's a non-smoker, where's the equity? I mean
11 nobody's disputing that smoking causes cancer. It's
12 about equity, and I'm not understanding how that's
13 equitable.

14 **MR. HENSHAW:** Russ Henshaw, NIOSH. I'm not sure,
15 Denise, if I can answer this question this time any
16 better than last time, but I guess all I would say is
17 that smoking in lung cancer is one of the issues we're
18 going to reconsider in the future, and hopefully
19 incorporate additional studies such as the Pierce study
20 that Owen Hoffman reviewed earlier. But beyond that, I
21 don't think there's anything we can add to that at this
22 point.

1 **MS. BROCK:** Just two more. The bone cancer, I was just
2 a little bit confused as I don't know if that pertains
3 to us or not. If you have -- are you saying that the
4 latency period should be lowered to five years? Is
5 that right, that if a person contracts or diagnosis --
6 right now is it ten years? It should be lowered to
7 five?

8 **DR. ZIEMER:** Owen or one of the SENES people may want
9 to address that. My recollection is that they were
10 saying the latency period perhaps should be shorter,
11 which would be more claimant-friendly, by the way.

12 **DR. HOFFMAN:** Yes, I -- it was in Iulian's presentation
13 this morning that this was brought up, and as a
14 precursor to the details on thyroid cancer. But
15 basically -- and NCI is doing this in the NCI version
16 of IREP is -- is correcting the latency for bone cancer
17 to allow for some probability of causation when the
18 cancers would be presented much earlier than is
19 currently considered. And the question is before
20 NIOSH, to what extent is this a significant enough of
21 an update that they would like their version to reflect
22 that assumption as well.

1 **MS. BROCK:** Thank you. And the next two are just --
2 are just statements. One would be in reference to
3 Shelby Hallmark from the Department of Labor stating
4 that any help would be appreciated. I've actually
5 talked with the Missouri -- the head of the Missouri
6 Building Trades Council and they've actually asked me
7 to come in and speak with them. They said that they
8 thought that that would generate thousands upon
9 thousands of claims, so I'm supposed to go talk with
10 them when I get back, after Senator Bond's office, and
11 that will cover the iron workers, construction,
12 dismantling, cleanup, what have you, so I will be doing
13 that next as well. Be really nice if you want to pay
14 me, that would -- hook me up, that would be great.
15 And I would also like to again ask the Board to please
16 come and have a meeting in St. Louis because this is
17 really tearing my budget up paying for all that
18 paperwork I send out to people to generate claims, and
19 then I have to try to get to these meetings, which I
20 don't want to miss. But if you would come to St.
21 Louis, it would be greatly appreciated and I'm sure I
22 can drum up plenty of people for public comment. And

1 thank you very much.

2 **DR. ZIEMER:** Thank you, Denise. Mark, comment here?

3 **MR. GRIFFON:** I just wanted to comment on one of
4 Denise's first points about the interview process and
5 the question -- I mean it's come up in a couple of
6 public commenters about maybe we need -- maybe these
7 questionnaires, the interviews, could have a site-
8 specific component or could have site-specif-- people
9 that know these sites better to conduct those. And I
10 don't know if any of that is happening, being
11 considered, I -- I --

12 **DR. ZIEMER:** I thought that Dick Toohey spoke to that
13 at the last meeting. I think the answer was yes, but -
14 -

15 **DR. NETON:** No, there's no site-specific component
16 because it's an OMB-approved script that we have to
17 follow. However, we do afford the opportunity, if the
18 claimant suggests something that we could follow up
19 on, we would do that. But at this point, we're not
20 considering a site-specific script.

21 I will say that in general we're not requesting the
22 claimant to go through -- it's not our approach usually

1 to go through an entire list of the periodic table and
2 ask them if they were exposed or not exposed. The
3 intent was to which nuclides, if you're aware, were you
4 exposed, and that is a list that would be used to
5 invoke maybe some memory. So it's -- and I think where
6 the confusion arises, we mail this script at the time
7 that the interview is going to be scheduled to the
8 claimant, just so they can go over it and get
9 comfortable with the lines of inquiry that we're going
10 to be, you know, talk through. And I think some people
11 receive the script and think that it's a detailed,
12 blow-by-blow thing that they're going to have to know
13 every answer, and that's maybe where the confusion
14 arises.

15 **MR. GRIFFON:** I guess the -- the -- just reflecting on
16 the last draft that came out about the interviews, or -
17 - or the information from workers I guess. They
18 weren't really interviews but a provided scripts or
19 information of what they did on their jobs, and again
20 and again, going through that report, I read that the
21 analyst tend -- tended to downplay some of this -- and
22 partially because, I think -- or one of their

1 conclusions in the report, and I may be summarizing
2 this wrong, but I think was that pulling the string on
3 all these things, to use your terminology, was going to
4 be very extensive. So my concern is that this
5 questionnaire process just doesn't become another check
6 mark in the processing of these claims, but rather that
7 NIOSH make -- there's some valuable information that
8 can be pulled from these claimants, rather than saying
9 well, if they can't answer it, we've got the answers.
10 I mean I think that -- and I -- go ahead, Larry.

11 **MR. ELLIOTT:** I got to talk to this.

12 **DR. ZIEMER:** Response, Larry.

13 **MR. ELLIOTT:** Let's go back to the start here. You
14 know, NIOSH -- I come forward and said we needed to
15 have an interview process here. It wasn't part of the
16 statutory requirement. We're very much interested in
17 hearing what the worker has to say. We interview
18 workers on the shop floor in all of our studies, in all
19 of our hazard evaluations, and so why not use that
20 experience in this program as well. We're very much
21 interested in hearing what the worker has to say and
22 we're not using it just as a check mark or checklist.

1 I'm sorry, I'm very passionate about this, but I need
2 to be passionate about this because NIOSH needs to
3 stand here and our integrity needs to stand up, and
4 this is part of that. So we're taking this very
5 seriously.

6 Could we do a better job on getting our interviews in
7 the hands of the claimants? I think we can. I think
8 we can do a better job of communicating the intent
9 behind what we provide in advance of the interview,
10 that it's not a -- we don't expect the claimant or the
11 survivor of the claimant to have all the answers. But
12 what we hope to be able to do is to help fill in some
13 gaps that may not exist in the -- and probably don't
14 exist, in all cases, in the DOE submittals that we get
15 back in our requests for dose information. So that's
16 the purpose and the intent behind this and I assure you
17 we take it very seriously and we want to hear what the
18 worker has to say.

19 **DR. ZIEMER:** That may be a key thing to make sure that
20 -- 'cause there may be a mismatch here. It sounds like
21 some of these survivors are thinking that the burden is
22 on them to come up with all this technical information,

1 so somehow it's not made clear to them that this -- if
2 you know something that we haven't culled out already,
3 we want to hear what that is. But somehow that message
4 needs to be communicated.

5 **DR. NETON:** I agree, I'd just like to comment on one of
6 Mark's comments about the site-specific scripts. I
7 mean I don't mean to imply we couldn't develop a site-
8 specific script and get it cleared through OMB, but I
9 think that we may sort of predispose the interview at
10 that point, you know, if we had a specific list and we
11 -- you know, then we wouldn't be able to pull out the -
12 - if we had a script of nuclides at Mallinckrodt, say
13 were you exposed to uranium and they came back and they
14 had information and said no, I was exposed to
15 plutonium, we wouldn't -- we wouldn't learn that. So
16 we try to keep it as an open forum as possible in this
17 process.

18 **MR. GRIFFON:** I'm not saying put words in their mouth,
19 either, with a site -- you know, some sort of -- that
20 you have -- you know, that kind -- but I think there
21 could be ways to do it site-specific. And I'm not --
22 and I know NIOSH's intent is to get this information.

1 I just wanted to -- it's more of a reflection on this
2 report that I was just looking at that we need to keep
3 our eye on the ball with this and that they may not
4 know -- I was just reflecting on the comments I heard
5 about -- and my research that they don't know the
6 radionuclides necessarily, but they have a lot of
7 valuable information that they can provide that when I
8 combine it with our other technical information it can
9 really validate your scenarios and your site profiles
10 and stuff like that. So that's all I was saying.

11 **DR. ZIEMER:** Okay. Thank you. Let's move on then.
12 Our next commenter is Philip Foley who is with PACE,
13 and Philip is here from Kentucky.

14 **MR. FOLEY:** I'm with the worker health program in
15 Paducah, Kentucky, and I'm hesitant to speak, but after
16 setting in this meeting, I feel I'd be doing my people,
17 my coworkers, a disjust-- a injustice if I didn't say
18 something.

19 We -- I have serious concerns with the dose
20 reconstruction because what placed Paducah in the
21 Special Exposure Cohort in the first place was that the
22 data -- there's a lot of data available. Mark's gone

1 through a lot of data at Paducah. But it was shown
2 that it was questionable, at best. And if I understand
3 correctly, when you do a dose reconstruction, you're
4 going to get this data from Paducah. Well, it's the
5 same data that placed us in a Special Exposure Cohort.
6 Just one -- I guess a for-instance. We had -- we've
7 had some risk mapping sessions. We'd asked the
8 gentlemen that were in releases, have you -- did they
9 do urine samples? Say yes. Well, how soon? Twenty
10 to 30 minutes after the release. So there's tons of
11 data, but it was taken at the wrong time. So you know,
12 you can look at this data and it will show that well,
13 they -- they weren't exposed. But that's because it
14 was taken too early.

15 There's a lot of things that you're not going to find
16 out -- I personally spent three weeks with an air hose
17 on top of a crane blowing all the dust and paint scale
18 and everything out of the 400 building, which is a
19 cleaning building, where they had a compressor shop,
20 they had a spray booth, I think they had a -- we found
21 out since, probably a neptunium trap, many things that
22 they had in this building. You know, these are the

1 kind of things these people are up against.

2 I saw the same letter, their questionnaire, that Denise
3 was talking about, and this gentlemen called me, was
4 about a 55-year-old retiree from our plant, and he was
5 upset. He was concerned because this page that listed
6 all these isotopes, said have you ever been exposed to
7 these. Well, you know, when I hired in in 1975 -- and
8 I'm sure -- I know long before that, when we asked
9 questions -- as an electrician, when I asked a
10 question, they said you don't need to know. You know,
11 this is national security. You don't have a need to
12 know. So we didn't know what was going on.

13 Now since, in the last three years working in the
14 worker health program, I've heard stories of these
15 gentlemen, when they brought the spent reactor fuel
16 from Hanford, stored it outside the control room in
17 barrels. They didn't know what was out there. Some of
18 them knew it was spent reactor fuel, but they didn't
19 know what was -- you know, it was just setting out in
20 the building. We had barrels of green salt all over
21 our buildings. There's a lot of exposures that people
22 probably weren't even tested for.

1 And I guess what I'm -- what my concern is, you know,
2 we've been called cold war veterans. I've heard us
3 called that and I've made this statement in a
4 Congressional hearing for Senator Bunting and also in a
5 DOE public meeting. You know, we're called cold war
6 veterans, and all we're asking is just don't leave us
7 out in the cold. You know, don't -- don't make us go
8 through some of the things like Denise was talking
9 about. We've got the 70, 80-year-old people. You
10 know, they don't know -- if you do a phone interview
11 with them, some of them that I talked with, you know,
12 they don't have -- their attention span is not very
13 long. They're not going to -- they're not going to be
14 able to set and go through this phone interview. I set
15 in on this gentleman with a phone interview and the
16 interviewer did a fine job. He didn't ask leading
17 questions. He listened to the guy. But I don't know
18 what he reported. And all I'm asking is just don't
19 leave us out in the cold. Help these people out.

20 **DR. ZIEMER:** Thank you, Philip. That concludes all the
21 names I have on the public comment list. Are there any
22 other individuals that were missed that I don't...

1 Okay, if not, let's quickly turn attention to
2 tomorrow's schedule. The Board will be reconvening at
3 8:00 o'clock in the morning. We actually start our
4 formal session at 8:30. There will be a session for --
5 basically for the Board. This is an ethics training
6 session that we're required to go through.

7 We will have a working session where Mark Griffon will
8 lead us through the next steps on the dose
9 reconstruction process that we're preparing for the
10 Board's quality assurance program, if I can use that
11 terminology.

12 There will be additional opportunities for public
13 comment tomorrow morning, as well.

14 Oh, and I'm sorry, I did miss -- we are going to have a
15 report on the epidemiological research program of the
16 DOE workers, so we will get a status report on that.

17 Thank you.

18 Also, tomorrow afternoon after the formal session, some
19 of the Board members will be touring the Oak Ridge
20 facilities. This will not be a formal Board meeting.
21 There will be no business conducted, but an opportunity
22 for some of the Board members to see some of the

1 facilities here in the Oak Ridge area.

2 I'm going to ask Cori if we have any additional
3 housekeeping items that we need to take care of today.

4 **MS. HOMER:** Just don't leave anything in the room.

5 **DR. ZIEMER:** Yes, do not leave things in the room
6 overnight.

7 So we'll now go into recess until 8:00 o'clock tomorrow
8 morning. Thank you very much.

9 (Meeting adjourned)

