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

THIRTIETH MEETING

ADVISORY BOARD ON

RADIATION AND WORKER HEALTH

DAY ONE

The verbatim transcript of the Meeting of the Advisory Board on Radiation and Worker Health held at the Crowne Plaza Five Seasons Hotel, Cedar Rapids, Iowa, on April 25, 2005.

C O N T E N T S

April 25, 2005

TRANSCRIPT LEGEND

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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
WADE, Lewis, Ph.D.
Senior Science Advisor
National Institute for Occupational Safety and Health
Centers for Disease Control and Prevention
Washington, DC

MEMBERSHIP

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

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
Espanola, 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 Leon
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

AGENDA SPEAKERS

(in order of appearance)

Mr. Tim Taulbee, NIOSH

Dr. John Mauro, SC&A

STAFF/VENDORS

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

AUDIENCE PARTICIPANTS

AMENELL, MARY
AMENELL, PAUL
BEHLING, HANS, SC&A
BEHLING, KATHY, SC&A
BLOSSER, FRED, NIOSH
BRAND, ANSTICE, CDC
BROCK, DENISE, UNWW
BUCH, CATHRYN JOANNE, IAAP
CHANG, C., NIOSH
DEEP, HEIDI, NIOSH
DEHART, JULIA
DETHERAGE, DEBBIE, IAAP
ELLISON, CHRIS, NIOSH
FAIRCHILD, FRAN, IAAP
FITZGERALD, JOE, SC&A
FLEMING, LEEANN
FUORTES, LAURENCE, UNIV. OF IOWA
GILDS, S.
GRAHAM, PAULA, IAAP
GREENE, ELLEN
GREENE, GARY
HALLMARK, SHELBY, LABOR
HEISTER, MELANIE, NCRP
HINNEFELD, STUART, NIOSH
HOMOKI-TITUS, LIZ, HHS
HORGAN, TOM, SEN. BOND
IVERSON, SI
KATZ, TED, NIOSH
KOTSCH, JEFFREY L., DOL
LEON, BETTY L., IAAP
LOVING, ANITA, IAAP
LOWRY, LORI, IAAP
MAURO, JOHN, SC&A
MCKEEL, DAN, MD, WASHINGTON UNIV.
MILLER, RICHARD, GAP
MOORE, RON
NESVET, JEFF, DOL
NETON, JIM, NIOSH
PORTER, DIANE, NIOSH
PRESLEY, LOUISE S.
RIDER, MARLENE, IAAP

ROESSLER, CHARLES
SCHAUER, DAVID, NCRP
SHELTON, JAMES L., IAAP
STONGER, JANE, IAAP
TAULBEE, TOM, NIOSH
THOMSON, KATHY, IAAP
TOOHEY, R.E., ORAU
VORHICS, DAN, IAAP
WEBB, E.D., IAAP
WEINREICH, REBA, IAAP
YERINGTON, LASCA, IAAP
ZIEMER, MARILYN

P R O C E E D I N G S

(1:12 p.m.)

WELCOME AND OPENING COMMENTS

DR. ZIEMER: Good afternoon, everyone. This is the 30th meeting of the Advisory Board on Radiation and Worker Health. We're pleased to be here in Cedar Rapids, Iowa for this particular meeting.

I would ask, if you haven't already done so, would you please register your attendance with us today in the registration book that's near the doorway. Also, individuals who wish to make public comment later in the meeting, there's a place for you to sign up there, as well.

There are copies of our agenda, as well as a number of other documents relating both to this meeting and other activities of the Board, and they are on the table down by the side wall. Please avail yourselves of those, as well.

At the meeting of this Board in St. Louis February 7th to 9th, member Tony Andrade was not present with us. Shortly thereafter the Board learned that Tony died on February 10th. I would like to read and enter into the record of this meeting a memorial resolution for Tony

Andrade.

Antonio "Tony" Andrade, acting leader of the Quality Assessment Office for the Weapons Engineering and Manufacturing Directorate, Los Alamos National Laboratory, died suddenly Thursday, February 10th, 2005. Tony had a distinguished career at Los Alamos and was recognized nationally as an expert on worker safety and radiation issues. His associate director, Dave Beck, said we will all miss Tony and his steady counsel and keen insights here at Los Alamos.

Tony Andrade began his work at the Laboratory as a graduate assistant in 1979 and became a technical staff member in 1981 as a member of the thermonuclear applications, or X-2 group. Later he led the former radiation protection group, ESH-12, and was group leader for Radiation Protective Services at the time that he was appointed to this Advisory Board, his appointment following his nomination by Senator Pete Dominici.

While at Los Alamos Tony had been a member of the National Security Program support team. He had also been a technical assistant to the

Associate Director for Defense Research and Applications, as well as nuclear reactor project specialist and director of the Omega West Reactor.

A native of El Paso, Texas, Dr. Andrade was a graduate in mechanical engineering for the University of Texas at Austin. He earned a master's degree in nuclear engineering and a doctorate in plasma physics, both from the University of Michigan. Tony Andrade is survived by his wife, Rosemarie, of -- who also works at Los Alamos in the nuclear materials technical division, and by four sons.

I would ask that the Board and those assembled please rise and let us observe a moment of silence in memory of our departed colleague.

(Pause)

DR. ZIEMER: Thank you very much. Board members, you have received a large stack of materials since the subcommittee session this morning. I'm going to ask Lew Wade if he can review what has stacked up here before you in addition to your regular Board book, and Lew, any other introductory comments you may wish to make at this time would be fine.

DR. WADE: Thank you, Paul. As you know, we're going to begin this afternoon to discuss the Iowa TBD and then tomorrow will continue on with a discussion of the Iowa SEC petition.

You have a number of materials that have been provided to you, some in your workbook and some given out during the lunch break, and I'd just like to walk you through those materials so that we all realize what we have. And I'd also solicit, if there's any additional information you might want, if you would let me know, I could get that information.

But if you'll start with your workbook under the tab that says “IAAP TBD, Technical Basis Document,” the first thing you'll see under that tab is the presentation that's going to be made by NIOSH concerning the revised Technical Basis Document.

Second you'll have a document signed by John Mauro dated April 18th, 2005. What this is is the report prepared by your contractor reviewing the Technical Basis Document. This was an unclassified review. It did not involve the Q-cleared individuals. This is something that was prepared by John and submitted to all

of us on the 18th of April.
In the stack that I've handed you -- that you received over lunch there's another document from John dated April 23rd, 2005. This is an addendum to the report that I just mentioned. It contains some additional thoughts and deliberations that John wanted to share with you, so that's an addendum to the April 18th document.
Also handed out is something from John dated April 22nd. This now is the report prepared by the Q-cleared representatives of SC&A. This document was prepared by them early last week and was cleared by DOE the end of last week and was sent to you on Friday. We're giving you a copy here on the likely possibility that you didn't have an opportunity to print that document out.
So in all there are three documents that your contractor has provided, two related to the unclassified review and one related to the classified review.
If you go then to the next tab in your book, the IAAP SEC petition, the only tab (sic) there is a supplement to the SEC petition evaluation

report, and it's dated the 31st of March, 2005. A handout was given to you in the form of a PowerPoint presentation. This is the presentation that Larry Elliott will make tomorrow to you. This is NIOSH's presentation to the Board with regard to the Iowa petition evaluation.

And then lastly you have a document with the letterhead of the University of Iowa. This is material that was provided to us under the signature of Dr. Field. It's information that he wanted to share with you.

So those represent the materials in your possession as it relates to this two-pronged discussion of Iowa that we're going to have, first the TBD and then the SEC petition. If any Board member would like me to make available to them additional materials -- the original SEC petition evaluation, all of those materials were made available to you. If anyone has any needs, just slip me a note and I'll get those materials to you as quickly as possible.

So that represents an accounting of the materials that you have relative to these

discussions.

The one additional thought I'd like to leave with you -- again, we're going to have an Iowa TBD discussion leading to an SEC petition discussion tomorrow. I'd like to remind you that the SEC -- excuse me, the SEC rule -- and I'll read from it -- the Director of NIOSH will propose a decision to add or deny classes of employees to the cohort. This proposed decision will take into account one, the evaluations of NIOSH; two, the report and recommendations of the Board; three, information and -- presented or submitted to the Board; and four, the deliberations of the Board.

I point out number four to you now. The deliberations of this Board are terribly important as they will create a record that will support your recommendation. I encourage you to -- to deliberate fully and to make that record as complete as possible as you undertake the issues surrounding Iowa. Thank you.

DR. ZIEMER: Thank you, Lew. And I note, Board members, there also is a handout from John Mauro which is his PowerPoint presentation.

Did everybody get that, as well? I found that in my stack and that's -- that deals with the Iowa Army Ammunition Plant. That will be our contractor's presentation. Make sure you have that.

DR. WADE: Thank you.

DR. ZIEMER: And then I call the Board's attention to a draft which we will address probably tomorrow, but this is a draft letter -- I don't believe it's available yet to the public, maybe it is -- so far we just have copies for the Board. We will make copies for the public. This is a letter which was -- the Board requested at its telephone meeting last month that deals with the Iowa situation and the Board's action or sort of no action in the intervening period, and deals with the issue of what happened with regard to our previous recommendation. So this will be in the form of a letter, which will be considered and will be directed to the claimants, and Mike and Rich were tasked to prepare that letter on behalf of the Board, so that -- you have that draft, too.

(Pause)

DR. ZIEMER: Okay, I'm sorry. I'm the only one

that has this. This is a secret draft and I'm not letting you see it.

We will -- we will get this copied and will make sure the Board members have it, and also it'll be available for the public. It's not in final form, but basically expresses some regrets about the situation.

REVIEW OF DRAFT MINUTES

DR. ZIEMER: Okay, let us proceed then. I call attention to the draft minutes in your booklet and you probably discovered by now that there is -- there's something missing in it. It revolves around pages 14, 15 -- well, 14 and 15 of those minutes. The -- you will -- you will see as you look at that that there's a large gap in the minutes in terms of content, and we are trying to retrieve the appropriate pages, so without objection we'll defer action on those minutes till later in the meeting, probably tomorrow or even the next day depending on how soon we get these. You can make sure everything else is okay in the meantime, but we will not take action until we have the full set of minutes before us.

IOWA ARMY AMMUNITION PLANT TECHNICAL BASIS

DOCUMENT

DR. ZIEMER: We're going to proceed now with the materials relating to the Iowa Army Ammunition Plant. This will be initiated by a presentation by NIOSH, followed by a presentation by SC&A, so we'll begin with the NIOSH presentation on the Technical Basis Document, and Tim Taulbee is going to make that presentation. Tim?

PRESENTATION BY NIOSH

MR. TAULBEE: Can everybody hear me okay? Thank you, Mr. Chairman, and ladies and gentlemen of the Board. I appreciate this opportunity to talk to you about the revision to the Iowa Army Ammunition Plant Technical Basis Document.

Before I get started I want to recognize one of my colleagues, Mark Rolfes. He's another health physicist. Mark and I worked on this revision together. Mark is primarily responsible for the internal dose changes to the site profile or the Technical Basis Document, whereas I worked on the external dose reconstruction components. Next slide, please.

Little bit of an overview of what I plan on

talking with you today about is a background of this revision, a little bit of the history of how we got to where we're at today with this revision. I'll specifically go through the changes with site description, onsite ambient dose, internal dose reconstruction and external dose reconstruction, and then wrap up with a quick summary. Next slide, please.

The main purpose of this revision was to address worker comments and concerns that we had heard through a series -- or a couple of public meetings -- or one public meet-- one public meeting and one worker meeting. And the second purpose was to extend the coverage period. Rev. 0 of the Technical Basis Document only covered from 1957 to 1974, and part of that reason was our uncertainty with the materials that were handled and the work practices from that early time period. So we knew with Rev. 0 we were going to have to try and do more work to understand those earlier exposures, and so that part was reserved. The new revision goes from 1949 to 1974. Next slide.

Specifically, some of the worker comments and

concerns that we heard dealt with internal dose, the handling of bare pits, depleted uranium exposures and how that -- the exposure potential occurred during disassembly.

Probably the largest thing that we heard was the use of Pantex data, and specifically for tritium exposures, radon. And then also the use of Pantex data under external dose with the neutron to photon ratios, and also again the handling of bare pits and workers not caring -- or not wearing dosimeters all the time.

What I'm going to do through my presentation is kind of hit on each one of these to go through the changes that we made to the site profile and how we revised it to incorporate these particular comments. Next slide.

So a little bit of the revision time line. About a year ago, in April 2004, was the first Technical Basis Document for Rev. 0, and this was developed by the Oak Ridge Associated Universities team and it was reviewed by NIOSH. And kind of the fundamental basis of that initial site profile was using a lot of Pantex data. With both Iowa Army Ammunitions Plant and Pantex assembling nuclear weapons, we felt

at that time that the work practices would have been similar. They were operated by the same company. We felt that that was a good surrogate.

In June 2004 Mr. Elliott and Dr. Neton came out to Iowa and discussed that site profile or Technical Basis Document -- pardon me if I'm using those two words interchangeably -- and the purpose was is to discuss it with the public and with workers. And during that time numerous comments and concerns were raised, and they came back to NIOSH sharing those concerns with the rest of the team. They asked Mark and I to look into these comments or look into these questions that workers had raised because they really posed potentially major problems with our initial assumptions of using some of the Pantex data and that applicability.

So in July of 2004 Mark Rolfes and I came out here and we had the privilege of meeting with workers -- some of them I see in the audience and it's good to see them again -- to discuss their concerns in more detail, in more depth, so that we could gain an understanding of that.

Following that meeting we came back to

Cincinnati and began to come up with our strategy of how we were going to review and incorporate their concerns, and we quickly realized that we needed access to more information. We needed to know what the source terms were, what were the early work practices, because at that time all we had reviewed was non-classified information.

We went to the National Archives and Records Administration, as well as to the Department of Energy in Germantown, in order to gain this additional insight as to -- to try and address some of these concerns.

In November of this year is when we began revising the site profile or the Technical Basis Document. We -- as part of the expanded time period we needed to conduct some calculations, some dose recalculations. These were conducted by Pacific Northwest National Laboratory under contract to Oak Ridge Associated Universities.

In January we submitted the revision for classification review. Because we had used classified information in our review, we were concerned of how much of that information would

get translated into the document, and we needed to get this reviewed by the Department of Energy to make sure that we weren't divulging anything or disclosing anything that we shouldn't be.

We received a non-redacted document back from DOE on February 14th. Unfortunately that was a week after your last Advisory Board meeting is when we actually got that document back.

And then in March we released the revised site profile. Next slide.

So now I'm going to try and go through some of the changes to the site profile and start with the site description and fissile materials.

Well, when did fissile materials first arrive on site? And what I'm talking about with fissile materials, they're the most radioactive component from an external and internal dose -- dose reconstruction effort.

We looked at lots of different sources -- interviews with weapons experts, review of courier service history, multiple literature notations -- and we really don't have a good answer for this particular question. We've got a general guideline of what time frame that we

believe these materials were on site. But since we can't rule out that early time period -- and I'll talk a little more about that in just a second -- we've used the claimant-favorable assumption that they've been on site since March of 1949, which is when the first weapons were assembled at Iowa. Next slide.

But some of the information that we do have that we can share is that the early weapons were what was called in-flight-insertable, thus they were a ball and capsule design and the capsule was kept separate from the weapon. The capsule was what would contain the fissile material, the uranium or plutonium. And this was kept separate from the rest of the weapon until the time of use.

We know that the first sealed pit assembled in Iowa was the W-25, and this was in December of 1956.

We know from the Line 1 project history reports that prior to the assembly of the W-25 that non-radioactive model pits, or capsules, were used in mockups during assembly.

From a report -- or a text written in 1979 about the Mason-Hanger Company, we have an

annotation that in 1956 the company recorded two more firsts at the Burlington AEC plant, and this is when they first began to assemble nuclear warheads for guided missiles, and in doing so handled the fissionable material for the first time.

In October of 1957 was the assembly of -- or the construction of Gravel Gerties, and the purpose of the Gravel Gertie is to marry, basically, the fissile material with the high explosives in a safe type of environment. What they were concerned with was an off-site release should the explosives go off prematurely, therefore there could be a dispersion of fissile material. So they constructed these Gravel Gerties and the first time that this occurred was in October of 1957. So all this data together still doesn't give us a definitive date, unfortunately, as to when the fissile materials were on site. And the primary reason is is we know they weren't assembled, but there was surveillance activity that went on during the assembly process, and surveillance would be bringing a weapon out of the stockpile and teardown and then reassembly.

And during that time period we can't rule out that the capsules didn't come back out of the field. We don't believe that they did, but since we can't rule it out, we've gone with the claimant-favorable assumption of assuming 1949. Next slide.

Another worker comment and concern that we heard -- that Mark and I heard out in -- down in Burlington back in July was that our exclusion of onsite ambient dose -- that there would be some low level exposure to workers not on Line 1 and that -- you know, around transportation gates and that type of thing. Initially the Rev. 0 used the Pantex data to justify this dose would be very low. What we've done is we've gone back and we've looked at the area dosimetry from with inside the assembly cells -- non-storage areas but assembly cells -- and determined from that data that there's a dose rate of around 37 millirem per year. So this purpose of this onsite ambient dose is to assign it to non-Line 1 workers. Next slide, please.

So moving on to internal dose reconstruction, one of the concerns we heard was workers

handling bare pits, and this caused us a great deal of concern when we first started our reviews because this affected both internal and external dose reconstruction. From an internal dose reconstruction, we were very concerned about the material oxidizing or something along those lines and being available for workers from an inhalation standpoint.

What we verified through a review of classified information is that all the fissile materials were encapsulated at the site. I can understand why workers would indicate the bare handling of pits. To workers this would actually seem as if they were handling bare metal, bare uranium or bare plutonium, but there was a cladding material. There was a material surrounding the actual fissile material, encapsulating it.

So following along with the internal dose reconstruction, I'm going to go through the tritium, depleted uranium and radon changes. This did not constitute a change in the Technical Basis Document. This was further confirmation of -- of Rev. 0. Next slide.

So with the tritium dose estimation -- again,

this was a reliance on the Pantex data, and some of the reason for the Pantex data -- not to make any excuses here, but it was more readily available at the time, at the initial time of the writing of the site profile, and we did rely on it too heavily. We should have gone more with the Iowa data.

Again, in Rev. 0 the basis for the dose estimation was Pantex coworker data. In the revision we used tritium measure-- Iowa-specific tritium measurement data. This was new data that we had collected. And then also process knowledge, and some of this comes from our interviews with workers, and this was a really -- very interesting component and we were very fortunate. When we sat down with workers back in July, we went through and they described to us how the materials would be handled onsite or arrived and how they would be tested and inspected. And then when we reviewed the AEC health and safety reports, we found that in fact same description of how these materials would be handled, how they would have been checked, and so we had two corroborating evidence. When we compared that

to the tritium measurement data, all three were telling the same story, so we're very confident that we've got an idea or that we know what was going on with the tritium in that time period, even though to date we have not been able to locate any tritium bioassay data. Next slide. So our tritium exposure model is based upon the purging of the headspace gas that's in the JP containers. These would be tritium shipping containers. And basically before these would be allowed to be released to production for assembly, they had to be purged to make sure the concentration was below 90 microcuries per cubic meter. Based upon this type of allowable concentration, we've estimated that the maximum annual intake would be about 4,900 microcuries per year, and this results in a dose of about 331 millirem per year.

Now this dose level would be easily readily detectable in bioassay. This dose level is higher than the typical or average value that you see at Savannah River, which is where these containers would have been packaged together. What we have is an AEC review in 1969 indicating no positive urinalysis. That was

according to their report in 1969. Now we don't know what they're referring to as what was positive. It could have been five microcuries per liter. But we do -- we also interviewed an Iowa laboratory staff person who analyzed the bioassay. And he indicated that there were a few positives; however, nothing abnormally high. He indicated that the vast majority of the data was zero, that it was below detection limit. And again, four microcuries per liter would have been readily detectable at that time period.

So with this revised model, the Iowa assigned exposure is approximately three times higher than what the maximum recorded annual dose at Pantex is. And the reason for this is we're using an exposure model instead of bioassay data. As you'll see with -- when I get later into the external dose reconstruction, any time we use a source term model to do our dose estimations, we end up compounding claimant-favorable assumptions and so our estimates of exposure increase quite significantly. Next slide.

Another concern that we addressed in the

revised site profile was dealing with the disassembly and depleted uranium exposures. From our review of classified information we determined that the original exposure source term from Rev. 0 was appropriate. However, as workers pointed out to us during our meetings that the frequency of disassembly and the time period certainly needed to be modified. Our initial assumptions were that Iowa primarily did assembly type of operations, not disassembly -- not assembly and disassembly. From our review of information, they clearly did more assembly than disassembly, but with the surveillance activity thrown in there, you've also got weapons coming out of the field, being torn down, which could be considered a disassembly operation, as well. So in Rev. 0 the frequency of disassemblies -- and this would be one worker -- what they're involved with was initially two disassemblies per year, and this was very, very low. Rev. 1 we've changed that to 100 disassemblies per year. And from our interviews with workers, they talked about that there would be a production schedule, that at times there would

be periods of assembly and then there would be periods of disassembly and then periods of surveillance. And so it was kind of a cycle that was going on and they stuck very close to that particular schedule. This is what we gained back in July.

What we learned also is the time period. Initially Rev. 0 only considered from 1950 to 1957. With the revision we've expanded that from 1949 to '74, and again this is due to that surveillance activity that workers would have been doing of the teardown of the particular weapons. Next slide.

Another internal dose exposure to change within this new revision was at Firing Site 12. During our review of the Iowa specific air sample data from FS-12, Mark noted that some of the positive air samples for depleted uranium were during regular HE tests. And we knew initially during the hydroshot tests that we would -- that we would see depleted uranium increases, and that was accounted for in Rev. 0 of the Technical Basis Document. However, these non-hydroshot tests or regular HE tests was a surprise to us. And in -- through

interviews with people familiar with the hydroshot operation and then subsequent HE testing -- this is likely the resuspension of contaminated soil following the hydroshot activities. Some of the uranium would be deposited on the ground and you'd detonate a regular HE charge and that -- some of that dirt would be resuspended, and that was resulting in the positive air samples.

Again, this exposure was not considered in Rev. 0. With the help of information from workers and so forth, we've added this as a chronic -- chronic intake model based upon the air sample data to account for exposures over the whole time period from hydroshots starting around 1965 to 1974. Next slide.

Another concern we heard was the use of Pantex data for radon estimation. And again, this was when we went and we looked back at the data that we had, and the Iowa radon measurement data was lower than the Pantex data that we had. Since this was lower, we didn't make a change to the Technical Basis Document. The geometric mean was lower than the Pantex data, and so we viewed this as being more claimant-

favorable; therefore we left this particular exposure alone. Next slide, please.

Now I want to talk a little bit about the external dose reconstruction and kind of go through the monitoring time line and specifically talk about photon dose and neutron dose.

What I'm not going to talk about is skin dose. I'm going to talk about that right here 'cause this is still reserved in the site profile. And the reason that the skin dose is still reserved at this point in time is due to a description that we heard from -- from workers and from Dr. Laurence Fuortes, who indicated that some workers discussed an exposure of reaching back into what -- what they referred to as the pit and wiping it out, the inside. Well, it wasn't the pit. It was -- this was of the ball and capsule design weapon, so they'd be reaching back into the ball and doing potentially some cleaning or something along those lines. In that type of an exposure scenario, at worst case the exposure would be depleted uranium. Therefore there could be a significant beta dose rate to the hand and to

the forearm, and at this time we can't estimate what that particular exposure is. However, it's non-penetrating radiation. This would be beta dose to the skin at this time. So until we develop that particular model, this skin dose is still reserved within the site profile.

So now talking along the monitoring time line, what you will find in looking at the data -- and I hope to walk you through it here -- is from 1949 to 1974 there's really four periods or eras of dosimetry monitoring. And era one would be from 1949 to 1955, and this is where there's no personal monitoring data. This is also during the time period of in-flight-insertable weapons. Therefore, we don't really have an indication that they were on site. If they were on site, then this would clearly be a gap in personal monitoring type of protection. If they were not on site, there wouldn't be any exposure and you wouldn't expect any -- any personal monitoring data during that time period.

Is this better, if I just stand back? We'll try it this way. Sorry.

Era two would be from 1955 to 1962, and here

all that we have is intermittent monitoring data. Typically what we have is one quarter of monitoring data per year, and it's important to note that we're not sure that they weren't doing more monitoring at that time period. We only have primarily the Landauer badge information. We know that they were using Tracer Labs, as well. And so from our data gaps, it could be where they're switching between vendors. We just simply don't know at this time.

We do know that this was the time period of the first sealed pits, that this is where we do have definitive evidence that the fissile materials were on site. We also know that at -- during this time period was the establishment of the Rad-Safe Program, or the radiation protection program, which included monitoring of individuals, both personal monitoring as well as air sampling. There was training that was conducted on all Line 1 workers for the safe handling of radioactive materials, as well as the development of emergency response capabilities, both on site and off site. All of this is in the Project One history reports

that are -- that were available from the University of Iowa and from the Department of Energy.

Era three is from 1963 to 1967. This is again routine monitoring data -- or this is the first time period when we had routine monitoring data. And the badging was of workers with the highest exposure potential, and specifically radiographers, assembly/disassembly workers and inspection workers. And I'll get to a slide a few down from now where I'll discuss this a little bit more.

During this time period was the first implementation of neutron monitoring data using NTA film, as well as the routine monitoring of fissile material storage areas. This would be area monitoring, area badges placed within the storage vaults. Next slide.

The final era is from 1968 to 1974. This is where there's extensive routine monitoring of the work force. They were using the Landauer Gardray badge. This was a J-type badge which was four-window film badge. It had an open window, a plastic window for beta determination, an aluminum window for low

energy photons, and then a lead/tin alloy filter for high energy photons.

There was also the badging of multiple types of workers. People generally entering any of the controlled areas were badged. We also see the first extremity -- routine extremity dosimeter monitoring. This was for people handling the more radioactive -- the actual pits during their inspection process.

Also we have continued neutron monitoring there in this time period, and then there's also extensive area monitoring of the fissile material storage areas as well as each assembly cell. At Iowa there would be a dosimeter put into each assembly cell. It was read on a two-week basis, and those results were recorded.

So what we have from an external dose time period is from era three and era four we have routine monitoring data that is available. Prior to this time period, all we have is -- well, we had no monitoring data, and then we had some intermittent data where sometimes there'd be a period of a few months that would be together, and then we don't have any more data for that particular year.

So we have two different types of dose reconstruction that we do here. One would be using the routine monitoring data and the other would be development of a source term model, and this is where the generic pit and the work factor come into play.

So what I would like to do is focus on this last time period first because this data is actually used back here in our model for estimating the earlier work -- or earlier doses, and so I want to try and explain this component first.

So one of the worker concerns that we heard with this latter period where dosimeters were -- were worn was that there was a loosely-enforced practice mandating radiation dosimeters be worn at all times. Some workers during our interviews indicated that they always wore their badge, others did not, that they didn't always wear their badge.

Well, what this does to the data is introduce a negative bias in the monitoring data, so there'd be too many zeroes within the dataset. Rev. 0 we didn't account for this. We only accounted for the missed dose based upon

readings below the limit of detection.
In Rev. 0 (sic) we incorporate this by applying a correction method of eliminating the zeroes, and let me go through that right now. The red line here is the original data. This would be from 1965 at -- at the Iowa Army Ammunition Plant. If you were to fit a distribution -- a lognormal distribution to this dataset, you end up with a geometric mean of about 6.6 mR per month that a worker would be exposed to.
Well, in this period of -- this 60 percent zeroes, we have three populations of people. One would be workers who wore a badge and were not exposed, so they are true zeroes. Another would be workers who wore a badge but the reading was below a limit of detection, therefore they were exposed but their badge reading would be zero. And now we've got this third group of people who did not wear their badge, even though they were supposed to and the rad protection group really didn't enforce the practice.
So we looked at how could we partition that across here, should we take the number of zeroes and partition it, 33 percent across each

one. Should we assume half of the zeroes were false zeroes. We looked at different ways that we could try and do this and realized that any way that we tried to partition this was going to not be giving the full benefit of the (unintelligible) or the uncertainty to the claimants, therefore we eliminated all of the zeroes.

So effectively what ends up happening is for our geometric mean we're now sampling up here at around 17.4 mR per hour. This would be about the 83rd percentile of the original data. So now we bias all of the monitoring data that we had. By eliminating the zeroes we moved it up to where we're only analyzing that top portion of the dataset. So this does introduce a slight bias to the data, but we don't really see any other way around estimating these zeroes. Next slide, please.

From this data the geometric mean of an annual dose is calculated -- these were monthly doses, actually four-week, so there's going to be 13 badge exchange cycles per year. And so in order to estimate this, you'd simply multiply by 13 by those values that are in Appendix F of

the site profile.
Some of the claimant-favorable assumptions that introduce this bias is that we're assuming an exposure every -- every cycle, every badge exchange cycle. We're not taking any credit that some people would be monitored but not exposed, nor that there are values that are actually below a limit of detection. So we've eliminated the limit of detection, we've eliminated true positive zero.
So these are the new annual dose distributions, and in specific this particular column here, and this would be the uncertainty in the upper 95th percentile. I've included in this particular slide the number of workers monitored. After we released the site profile -- this is one of the quickest comments that we got back, that we had taken out that number of workers and what was NIOSH trying to hide. I wasn't trying to hide anything. I simply didn't use it in my data analysis. What I was using here was the positive dosimeters, and that was why that particular information was in there. I apologize if anybody was under the impression that -- that I was actually trying

to hide this information, but it certainly wasn't. In a revision of the site profile I will include it back in.

What we have here is the actual number of positive dosimeters, by year, and this is what we used to develop those particular distributions. And as you can see, we have several hundred per year, totaling up to about 6,000 total positive dosimeters measuring radiation dose at Iowa. This is out of a total of about 22,000 dosimeters over this time period. Next slide. Oh, I'm sorry, go back for just a second.

What I want to do is -- because of this concern about the number of workers monitored in this early time period, I took 1965, which was 46 workers, and went back and determined where -- who were those workers during that time period. Next slide.

And in going through my assessment, what we found is that of the 40 workers within a single dosimeter cycle in 1965, 15 of them were from the production department, nine were from the inspection department, six from the X-ray department, and these were the workers who were

the most highly-exposed on the site. These were the people handling the pits directly and directly working with the fissile materials. Safety and the AEC also were included in this population. Most of the zeroes that you see in the dataset are from these two pop-- from these two particular groups. So by discarding the groups or discarding all of the zeroes, what we've got is a sampling of the highest exposed workers.

Other of the other interesting things in looking at the particular datasets was following our discussions with workers out here in Iowa where they were very -- very helpful in describing their work practices and the work activities, I was able to go back to Cincinnati and look at the dosimeter reports and look at the names, and I saw several of the same people that I had just interviewed, that I had worked with, that were describing these exposures to me. So I'm very confident that we have the highest exposed workers in this -- even though this is a small population, we've actually included them.

The other thing to consider within this

population is that in 1963 the AEC put out standards for radiation protection, and this would be AEC manual 0524. In that they required individual monitoring for all workers likely to exceed ten percent of the quarterly limit. The quarterly limit at this time period was three rem per quarter. So they were required to monitor everybody who had the potential of exceeding 300 millirem. If you'd go back a slide.

What you'll see here is during this time period -- this is the upper 95th percentile of our modified distribution. All of these doses are well under the 1.2 rem per year that would trigger that particular type of monitoring. And this is why only a sampling was done. This is -- this is compliance-based monitoring. We see this across multiple Department of Energy sites where they only monitor the workers that they feel are the highest exposed to ensure compliance with the AEC regulations. As the doses began to expand, so did the number of people being monitored and the number of -- the issuance of dosimetry really increased, almost -- well, three -- four-fold. So as things --

as materials would begin to increase dose rate, you end up with a higher monitoring percentage. Next slide. No, the next one.

Another worker concern that we heard was the handling of the bare pits. Even though the pits would be encapsulated, there was concern of the low energy photon dose. For Rev. 0 (sic) this is where we used the generic pit. And some of the claimant-favorable assumptions here that we use is that all pits were plutonium without cladding. And there's only so much that I can say about cladding -- that I can disclose about cladding materials, et cetera. In fact, it's very little, so to ensure I don't say anything that I'm not supposed to, let me read something out of here, out of the site profile, because I know this is approved text.

(Reading) It's important to note that not all components had a significant low energy photon dose. There are three basic types of pit used in assembly and disassembly at Iowa. One, enriched uranium pits; two, plutonium pits; three, composite pits, or a combination of plutonium and enriched uranium. Since the low

energy -- or, I'm sorry. In the composite pits the plutonium always had an outer shell of enriched uranium.

So when they were composited they would be surrounded by enriched uranium, and enriched uranium doesn't have much of a low energy photon dose compared to plutonium.

(Reading) Since the low energy photon dose from enriched uranium is negligible, only the plutonium pits had a potential for significant low energy photon dose.

So what we've assumed from the generic pit standpoint, and for all time periods, is that all of the pits were plutonium. So we've eliminated all of the others in an effort to overestimate. We've assumed that there's no cladding. We've also assumed that all the pits were 15-year aged plutonium, and this could be typical of a disassembly type of an operation. As plutonium ages, over time you get more in-growth of plutonium 241 converting to americium, therefore the dose rate actually increases over time from fissile materials.

Another overestimating assumption that we've used is that all dosimeter badges could only

measure a fraction of the americium 241 photopeak. This is the predominant dose component from -- from the plutonium pits, especially the aged ones.

When we initially wrote this revised site profile, this was our assumption 'cause we were quite confident that as we gained more information about their photon monitoring that we would find that their dosimeter probably could have measured this dose -- the full dose, not just a fraction. But at the time when we wrote this back in November, December and January, we didn't have that information yet and so we put this in as a claimant-favorable overestimate. Since then we've found out that clearly the use of the Landauer Gardray J badge could measure the full photopeak, and so this is really an overestimate. All of these maximize the low energy photon dose. Next slide.

So the changes to post-1963, what we've done is we've corrected for the potential negative bias of workers not wearing their dosimeters by a reanalysis of the dosimetry data. We've incorporated the low energy photon dose from

specific pits, and these are the adjustment factors that I've got here. When you total these up, this comes out to about a factor of two that we would be multiplying their dosimeter dose by in order to account for this low energy photon dose.

I guess I should back up a little bit there. With the concern on the low energy photon dose, the initial Rev. 0 of this site profile indicated that all of the pits were -- would be of sufficient -- the cladding would be sufficiently thick such that there wouldn't be any dose. During our review we've determined that that is generally the case, but not always, and this is why we used the plutonium over the whole time period. Next slide.

So now let me talk about the changes for dose reconstruction prior to 1963. Prior to 1955 we don't have any monitoring data. We expected the exposures would be low due to the absence of fissile material, and if they were present at all it would be during these surveillance or modifications, retrofits that would be conducted, so it wasn't a routine type of an exposure, as it was in latter years.

Starting around 1955 we have intermittent monitoring data, but since we -- to fill in those gaps, we decided to go with the source term model using a generic pit and a work factor. And again, any time we use source term type of model, we end up compounding claimant-favorable assumptions on top of each other and this over -- tends to overestimate the dose. Next slide.

So when we first talked about the generic pit, what we needed to do was find out what the source term was and be able to talk about it, and our goal was to try and be as transparent as we could at the time. And so through a review of the classified literature and with the assistance of the Department of Energy, we developed parameters to describe a generic pit. And the goal of this was to come up with a bounding -- a bounding pit. With these parameters, and these are identified in Appendix D of the site profile or TBD, what we have is the result of an upper bound of the photon dose rate from all pits at Iowa. With these parameters, with our modeling, this is the upper bound. This would be the maximum

dose rate a worker would be exposed to from handling one of these materials.

These calculations were conducted by Pacific Northwest National Laboratory by Dr. Rick Traub and Dr. Bob Sherpells*, who ran MCNP codes in order to calculate what this dose rate would be, and then this was compared with measurement data.

The purpose -- go back, I'm sorry. The purpose of the generic pit, again, was to establish an upper bound. So with this generic pit we could come up with -- if a worker were to hold one of these pits for 2,000 hours of a year, this would be a true upper bound for the particular worker. What we wanted to do was come up with is a more reasonable dose, 'cause the purpose was to put this and assemble this object into a -- into a weapon. This is where the work factor came in. Is there a way we could use the latter monitoring period to estimate what the relative time or proximity or shielding they would have been exposed to from the earlier time period. Now next slide.

So again we're using the routine monitoring data here in trying to estimate what the dose

would be back in this time period. Next slide. So again, the work factor is a relative occupancy, proximity and shielding factor. It was not intended to be maximized. It was never intended to be the 95th percentile. The combination of the generic pit, which is an upper bound, a maximum dose rate, and the work factor is an overestimate of the dose. And this is where you basically take -- you can -- you can prove this to yourself by looking at normal distributions and multiplying one by the other. If you take a maximum, like a 99th percentile of the normal distribution, and as long as you're multiplying your second distribution by at least the mean, or something slightly positive, then you're going to end up with your final distribution being an overestimate of the combination of the two. Okay?

So it was never intended to be maximized. It was the combination of these two would result in an overestimate of the dose.

The work factor was calculated by taking that modified annual distribution times the correction factor to make the units work

between exposure and personal dose equivalent, divided by what we call the era dose rate times 2,000 hours.

Now unfortunately, here's where transparency or disclosure becomes an issue because I can't really describe to you what the era dose rate is or how we calculated it. So this is an area where I was able to explain it to Mr. Presley and Mr. Griffon and Mr. Fitzgerald and Ms. DeMers in Germantown, but in this scenario I can't disclose how we actually calculated this particular dose -- this dose rate. Next slide.

To calculate the work factor, though, what we took was the modified Hp(10), the era dose rate times 2,000 hours will give you the simulated annual dose, and we calculated a series of work factors. And you'll see we've divided those between era three and era four, and the reason we did that was we knew that there was a change within monitoring -- where is that; here it is -- where in this later time period we're looking at thousands of dosimeters being issued. And so we wanted to know was there going to be a change in the work factor during this time period, and our initial intent was to

take the maximum of the two. What we found is we got basically the same answer.

So we're very confident that what we're predicting here is the actual exposure potential, because it tracks along with our era dose rate changes. Next slide.

So in estimating the pre-1963 dose, we take the generic pit -- which again is an upper bound. We have a claimant-favorable central tendency of the work factor, and I've got this as a small arrow because it's a slight bias; it's nothing like what the generic pit bias is. Times 2,000 hours, and then we get into a little bit of a problem with the americium and the 15-year assumption -- claimant-favorable assumption, and then in 1949 there was no such thing in the AEC as 15-year plutonium. So we ramped this up, assuming that plutonium was all made in 1945 up to a maximum in 1960. Overall this is a -- this results in an overestimate of the annual dose. Next slide.

And this is illustrated by this graph. This is our model dose, and you can see that the value peaks out here about four -- about four rem, four and a half rem, and this is before you

apply any adjustment factors. This is before you apply that additional dose -- or not additional dose but the correction for the low energy photon response. So effectively these values would all be multiplied by two. And what you'll see -- this is where the model dose and uncertainty and compounding claimant-favorable assumptions ends up overestimating what the actual dose would be. 'Cause within this parameter here -- these arrow bars, by the way, are the fifth and 95th percentiles. They're not one standard deviation. So effectively here in this early time period we have the fifth percentile equating about the 95th percentile later time period monitoring. This is how much of an overestimate some of this modeled dose that we have is.

Again, because we have intermittent monitoring data here and we have no monitoring data here, using a source term model's going to introduce uncertainty, going to introduce compounding claimant-favorable assumptions and you end up with a dose that is -- is quite large. The true dose is somewhere between zero and up in here (indicating). Okay?

Another worker comment concern that we heard was the Pantex neutron to photon ratios. And again, this initial assumption of using the Pantex data was out of -- out of convenience from the early time period of Rev. 0 in that a lot of the Iowa data had not been coded yet so it hadn't been put into a format such that we could easily analyze it. Since then we've coded it. We also used MCNP to determine the under-response of the NTA dosimeter. NTA film has a problem below about 800 keV neutrons in that it really can't measure them, so we used MCNP to model what fraction of the dose would be below 800 keV, and it comes out to about 40 percent. So from a claimant-favorable standpoint, we doubled the actual dose. It would be like 50 percent.

And when we finished doing this, the Pantex data still indicated a higher ratio, and this is likely due to the contemporary use of lead aprons. At Pantex they use lead aprons to block some of the photon dose that would be delivered to a worker. In the use of a lead apron you're going to be blocking the photon dose, but the neutrons it's pretty transparent

to. So the end result was no change to the Technical Basis Document. And on the next slide let me show you what the actual values were.

The original Iowa data, neutron to photon ratio, was .15. When we corrected based upon MCNP, it raised this to about .3. The Pantex ratio is .79, so it's about a factor of two and a half higher than what the corrected Iowa data would indicate. Since this was a claimant-favorable assumption, we already had it in the Technical Basis Document, we didn't try and revise it in order to do -- make any changes. Next slide.

So in summary, the major purpose of this revision was to incorporate worker comments and concerns. The second part was to expand the dose reconstruction methodology into that early time period. The initial site profile was truncated at 1957; we needed to expand it back to 1949.

As you can see from the presentation, transparency and the disclosure of information from '49 to '62 -- I really can't tell you all that there is about the work factor and the

details of how that was calculated. From '63 to '74, with the release of the generic pit dose cal-- dose rate calculations we can now discuss what that full dose rate would be, and there is no issue with disclosure in that time period.

And finally, while disclosure is an important program value for us at NIOSH, it's not an overriding limitation on the scientific conduct of our dose reconstructions for compensation purposes.

And with that, I'll be happy to answer any questions.

DR. ZIEMER: Thank you, Tim. Let's begin with Wanda Munn, and then Gen Roessler.

MS. MUNN: Since there's no indication of any fissile materials on site prior to 1955, I have forgotten why we felt it necessary to begin our overview at 1949.

MR. TAULBEE: 1949 is when they did the first assembly of nuclear weapons. After -- once you start an assembly operation and you start sending weapons off into the stockpile, they would come back occasionally under surveillance type of mode where they would be torn down and

then put back together again. We can't rule out that the capsule didn't come back at this time with those weapons during the surveillance. We know that they were not assembled -- the capsules were not assembled into the weapons 'cause we have evidence of the use of mockup pits for that purpose. So it's that early time period of that potential for exposure. We haven't been able to rule it out is the simple reason.

MS. MUNN: I see. Thank you.

DR. ZIEMER: Clarification here, perhaps, too. Identify for the recorder, please.

DR. FUORTES: Hello, this is Laurence Fuortes and a couple of statements have gone by that I would like to take issue with, but just this one about the lack of evidence of fissile material prior to 1955 is not evidence of no fissile material prior to 1955. That is a statement regarding the availability of data to NIOSH confirming fissile material after 1955, not absence, not confirming absence there of -- prior to -- we have workers who worked as early as 1950 describing no mockup pits at that period, so I'd say if you want to ask Mr. Webb

or one of the other workers, we can try to clarify for you that concern, but this speaks very, very, very strongly to a concern I have about the availability of data to NIOSH to corroborate certain things. So I hope that philosophical point makes sense.

DR. ZIEMER: Thank you. Okay. I think Gen Roessler and then Jim Melius.

DR. ROESSLER: My question has to do with the radon estimations that you pointed out. It's on page seven in the slide. And you say that based on the information you have, the levels were lower in the -- this area than in Pantex. Well, that's really -- for those of us who live in the upper midwest, that's contrary to what I would think because Iowa is a high radon state and I think this is pointed out quite dramatically in a letter which you probably haven't seen yet, but from Dr. Field. So I don't know how much data that was based on. I guess I'd like a little more evaluation of that situation, that natural radon.

MR. TAULBEE: Okay. Well, we can certainly do so. Part of the reason that we did not use the Iowa-specific data was, one, it was less than

what the Pantex data was. Number two, we couldn't tell where those measurements were taken on site, whereas with Pantex we had building identification so we could tell where they were being -- where they were taken and -- you know, in the Gravel Gerties, et cetera. At Iowa we just had a collection of data, so we didn't have exact information of where the buil-- where those measurements were taken. So as a result, between the two, when you don't know, we went with the Pantex data. We could certainly try and evaluate that further. I don't know that we've gone back to the Army recently to see if they actually have measurements, you know, within the past year.

DR. NETON: Tim --

DR. ZIEMER: Jim Neton, could you add to that?

DR. NETON: I'd just like to add a little bit of clarification on that point. I believe there was something on the order of about 380 measurements taken by the Army, but they were taken fairly contemporary -- in a fairly contemporary time frame, about 1989, so -- and we -- we don't know which buildings -- they weren't identified as being associated with any

particular building. We do feel that we need to go back and take another look at that. For example, they may not have been -- since they were taken by the Army, they may not have been placed -- measurements may not have been taken in areas that were underground, representing the higher potential exposure levels in those areas. So we -- we are willing to go back and certainly feel we need to go back and take a look at that -- that data -- those data.

DR. ZIEMER: Jim Melius.

DR. MELIUS: Yeah, I have some questions about the data availability issue. I believe in your presentation, Tim, you made a reference to when the original ORAU site profile was produced that at that time, quote/unquote, the Pantex data was more available and therefore they used it, and since then you -- you being NIOSH or whoever's been involved in this effort -- have gone and obtained more data. But is there other data available that you have yet to examine? I mean it would certainly appear from what we've been hearing about both the radon and about some of the other data that -- that we're continually finding new sources of

information about this site. And could you give us some sort of overview on that?

MR. TAULBEE: Certainly. Any time we're developing a site profile -- site profiles are designed inherently to be revised and updated as we get new data. At some point you have to put an end to the -- to the research and issue a Rev. It doesn't mean that you actually stop looking for data or stop continuing to collect data. It just means at this point in time we needed to get a revision out so that we could start doing dose reconstructions. The actual research could go on effectively for years in a sense. And so from that standpoint, we need to start doing dose reconstructions. So it's a balance between how much data digging do we do, and then how much do we feel we've got enough to bound some of the dose estimates.

To give you a perfect example here, I really believe once we get the tritium measurement data, we will have sufficient evidence to go back and revise the site profile such that the tritium doses that we're assigning now are -- are much higher than what the actual exposures were. The bioassay data I believe is out there

somewhere. It could be at Pantex. It could be in Iowa Records. We have looked extensively for that. But that's an example of potentially other data sources that are out there that could affect the site profile. However, our goal in this particular revision was to come up with upper bound estimates such that any new data that we found would basically confirm that our estimates were in fact overestimating.

DR. MELIUS: Yeah, I think you misunderstood my question.

MR. TAULBEE: I'm sorry.

DR. MELIUS: I'm not really concerned about your philosophy in doing this, though I appreciate that explanation. But rather what -- what do we know about what data is out there that has not been examined? There's a lot of references in your report and I believe some of the other reports to a lot of data from Iowa being shipped to Pantex, being stored there. Has NIOSH ever done -- gone in and tried to do an inventory of what's available and examined that information and --

MR. TAULBEE: We received from the Department of Energy an inventory of those records that

are down at Pantex. There's about 120 boxes of records that are down there. We received some description about those particular records. Based upon those descriptions we requested some of those records from Pantex. An example would be the Iowa tritium measurement data. That was something that we found through that records retrieval and review process. So yes, we are aware that there are records down at Pantex.

DR. MELIUS: But -- but you've never gone and examined those --

MR. TAULBEE: We have not --

DR. MELIUS: -- records directly.

MR. TAULBEE: We have not individually gone down there. We have reviewed those summaries of what the records were and requested samples, and based upon that methodology we were able to retrieve both air sampling and -- both air sampling data for tritium and depleted uranium.

DR. MELIUS: Yeah, so about how much of that proportionally -- I mean is that -- you think you've examined all the data there or is --

MR. TAULBEE: Certainly not.

DR. MELIUS: No. So it's a small proportion of it.

MR. TAULBEE: Yes, sir.
DR. MELIUS: Okay. Thanks.
DR. ZIEMER: Okay. Additional questions or comments? Mark Griffon?
MR. GRIFFON: Can -- looking at this pie chart -- I'm trying to find the page --
DR. ZIEMER: Page 13 is --
MR. GRIFFON: -- page 13, yeah. This is for 1965, the question of the jobs that were monitored.
MR. TAULBEE: Yes, sir.
MR. GRIFFON: I know --
MR. TAULBEE: Those are departments.
MR. GRIFFON: Excuse me?
MR. TAULBEE: They're departments.
MR. GRIFFON: Departments, okay.
MR. TAULBEE: That those workers came from.
MR. GRIFFON: Okay. Do you -- do you have department information for all time periods or is this a -- how -- how did you come -- how did you --
MR. TAULBEE: Well, this information came from --
MR. GRIFFON: -- construct this table, I guess?
MR. TAULBEE: -- the University of Iowa, from

their records that we captured a couple of years ago. The best summary that we have is really from about 1965 forward, from a department standpoint. I believe, and please -- if Dr. Fuortes knows more about those records holdings -- I believe the Army has individual employment cards over all time, but I am not that familiar with that standpoint.

MR. GRIFFON: Okay, and -- and as far as the -- the dosimetry records that you used post-'63 to '75 or so, those didn't have job titles on them, did they, or...

MR. TAULBEE: Not all of them have job titles. We do have some job titles, but it's certainly not comprehensive at this point in time.

MR. GRIFFON: On the -- on the follow-up slide on that, the discussion of the bare pits, I just wanted to -- a clarification on the assumption of the bare pit is claimant-friendly on the low energy photon doses. It's also claimant-friendly on the overall photon dose received? I just wanted to --

MR. TAULBEE: That's correct.

MR. GRIFFON: -- you didn't say that, I just wanted to --

MR. TAULBEE: That is correct.
MR. GRIFFON: -- I think we can say that. Right? Right.
MR. TAULBEE: Yes. Yes.
MR. GRIFFON: All right.
DR. ZIEMER: Did you have additional follow-up? Go ahead, Dr. Melius.
DR. MELIUS: Yeah, I -- back to the pie chart, I think you may have answered this indirectly, but do you have num-- sort of the denominators for those department -- how many people worked in those departments at that time so --
MR. TAULBEE: No, I don't, not for 1965, sir. Although we could -- probably could develop that by coding all of the information, all of the annual summaries that we had. But where this information came from was a tally of workers, their summation of their occupational history -- I'm sorry, occupational dosimetry. This would all be put onto one form with the department listed on that particular form. And there's about -- I believe around 800 of these particular forms and we have not coded all of them to give you a proportion --
DR. MELIUS: Okay.

MR. TAULBEE: -- at this time.
DR. MELIUS: And a related question, as you get back into that earlier time period of monitoring, I believe you -- yeah, one of your slides here for era three, and actually I think going back into era two, but for the monitoring that was done you refer to it as being done to workers with the highest exposure potential.
MR. TAULBEE: That's correct.
DR. MELIUS: Is that based on an evaluation of whether those people have the highest exposure based on data that was subsequently collected, or is it based on what sort of the philosophy of the program was at the time?
MR. TAULBEE: It's a combination of -- of things. One is from our interviews with actual workers out here in Iowa last year and then going back and looking at the dosimetry records and seeing the people that I was talking to, seeing their records. And listening to them talk about what their exposures were, they were clearly the ones doing the assembly, the disassembly, the inspection that was going on. That's one component.
The other component comes from CATIs. The

third component does come from monitoring philosophy at that time. So it's a combination of things that have given us this picture. It's not one particular piece of information.

DR. MELIUS: But there's been no systematic verification of that, going back through and looking at people by department or -- or where they worked to try to get a sense of who might have been missed based on -- you know, whether -- what high exposures might have been missed based on subsequent data that became available about that department and so forth during years when there was much more comprehensive monitoring.

MR. TAULBEE: That is correct. I would like to -- that -- that's correct.

DR. MELIUS: Yeah, maybe systematic isn't the right -- I may -- that may be --

MR. TAULBEE: That's not the word.

DR. MELIUS: -- exaggerating it with the way you --

MR. TAULBEE: What I would like to indicate is that there is other information that we do have that I'm sorry I can't disclose dealing with source term that also helps us make this

determination.

DR. MELIUS: Yeah.

MR. TAULBEE: I'm sorry.

DR. MELIUS: But -- but -- you don't have to apologize for that. But you wouldn't necessarily know, based on that other information, you wouldn't know everyone that -- all the -- who was -- might have been exposed in a similar situation that wasn't monitored.

MR. TAULBEE: That's correct, yes, sir.

DR. MELIUS: Yeah, because it's very -- I mean it's -- I'm just trying to get an understanding of how robust that --

MR. TAULBEE: I understand.

DR. MELIUS: -- that conclusion is.

DR. ZIEMER: Tim, could you help us understand a little further -- I'd like to go back a minute to the -- the boxes at Pantex, and you made a decision to look or to request certain things. Tell us a little more about the things that you did not request. On --

MR. TAULBEE: Okay.

DR. ZIEMER: On what basis would you have said we don't need these now or these may not be nearly as important or -- and sort of follow

that -- I think sometimes we're left with an uneasy feeling that there's 100 boxes out here and we've gotten a few files, but what's in the rest of those? And this Board is, in a sense, under pressure -- time pressure, as a minimum, and to make a decision with a lot of boxes only examined by titles or file names or something. Help us understand that whole business.

MR. TAULBEE: Certainly, and I apologize for not expanding more on this earlier. What we had was -- we have the boxes, we also have the description. In many of the boxes, especially the dosimetry records and rad protection type of monitoring and incident reports along that, what was accompanied in there was a copy to the University of Iowa. Back a couple of years ago we sent a team out to the University of Iowa to Dr. Fuortes's shop and captured all of those records. So when we saw that particular label on a particular box, then we didn't try and request more information from that because we knew we already had that, that (unintelligible) --

DR. ZIEMER: And give us a feeling for what -- is that a big fraction of the total or...

MR. TAULBEE: A big fraction, it is a --
DR. ZIEMER: Significant figure --
MR. TAULBEE: -- my guess is probably 25 percent type of a scenario, maybe -- let me go through what some of the other boxes are that we made the decision not to, and this would be like a box labeled the Mark 30 program logs, for instance. And what this would contain would be all of the specifications and so forth for that particular weapon. And so it wasn't related to dosimetry.
When we went through and we saw something that would be related towards occupational exposure, that was where we asked for sampling of records. Some of our sampling of records did not return what we thought that they might have. For instance, there's several boxes of smears or swipe data, and so we asked for sampling from that, hoping that that would be, you know, uranium or radioactivity smears. What they were was smears for beryllium, and so -- or for -- there's also other boxes labeled as bioassay and so we asked for a sampling of those records, hoping that they would be the tritium records. And it would be bioassay for

MOCA, a high explosives that they were doing monitoring for. So that was our process of going through and eliminating which boxes that we would want and which boxes that we didn't. And I would probably say 50 percent of them or more were clearly a group of production type of records related to specific weapons assembly/disassembly.

DR. ZIEMER: Thank you. Mark?

MR. GRIFFON: Just to follow up on that, Tim, were those boxes classified, any of those boxes classified or...

MR. TAULBEE: Any time that we request a set of records out of the Pantex and Iowa holdings, it undergoes a classification review.

MR. GRIFFON: Oh, no, I meant of the 130-box inventory at Pantex --

MR. TAULBEE: I don't know which ones are classified.

MR. GRIFFON: On your index you couldn't tell, right? Okay.

MR. TAULBEE: They're all stored in a classified vault.

MR. GRIFFON: Oh, they're all in the classified vault, right?

MR. TAULBEE: Yes.
MR. GRIFFON: Right. But you don't know because you weren't there --
MR. TAULBEE: That's correct.
MR. GRIFFON: -- whether there was something -- right. I mean I guess part of our experience doing this work is that oftentimes there's some very valuable health and safety information amongst those production records, so I'm not sure that that's just -- sometimes those titles can be deceiving.
Having said that, I have one other topic I think that wasn't covered in the presentation, but it was brought up by worker testimony at past meetings and maybe in letter form. I forget where I've seen it. This question of the potential for fissile materials to come off the pit and have potential internal exposures from plutonium in that manner. And I know that this was -- was not considered an issue, but in Appendix E -- I'd point the Board to this section in Appendix E of the TBD, if you have it with you, you point out that it couldn't happen, and then in this next paragraph it states that it actually happened a few times at

Pantex. Although you go on to say that these incidents were well-documented, my question would be that, you know, is there a -- I mean it certainly could have happened at Iowa and you just didn't retrieve those incident reports. That's one fear I have, maybe. Are you -- I mean it seems like you're pretty certain that no plutonium exposures could have occurred at this site. Are you ready to make that kind of statement here or where do you stand on that? I know we had a little follow-up in some of the subcommittee meetings, as well.

MR. TAULBEE: That's correct. And this is something that we are trying to track down more along the lines of the plutonium waste that you had pointed out to us a couple of weeks ago in a relatively small quantity. Due to the magnitude of those particular accidents, we see at Iowa very similar types of accidents where a pit would be dropped or something. We do have incident reports for Iowa, and we see where the workers evacuated the cell or the room when this would occur -- when this occurred and the rad safety group coming back in and checking

the materials. So we see the similar type of incidents occurring. The difference is is that at Pantex one of them actually broke open -- or it actually didn't break open, it cracked. It had a fracture in the particular pit following this incident and it contaminated the whole cell. And there was bioassay and follow-up along those lines.

Based upon the monitoring practice and monitoring program that was going on, the routine smears and the care of the workers in the handling of their materials, I'm fairly -- I'm very confident that there was not any of the catastrophic incidents that we saw at Pantex. There was certainly the potential, by far, and concern of when a very similar accident happened. It just simply didn't break open at that time.

DR. ZIEMER: Henry Anderson.

DR. ANDERSON: Just trying to get a handle on some of the data, do you -- do you go through and sort of grade the information by its utility? I mean for instance, there may be measurements like there was for radon, but it's 35 years after some of the people may have been

there and there's some other -- now it's measurements, but one might question, as you did; you decided not to use that and use radon in another part of the country. Do you go through that with some of the other data? For instance, we've heard that in some of the measuring -- or the badges, you have the badge data, you can do some of the laboratory issues of limits of detection and things like that, but it might be less useful because you don't know who they were on or what the people were doing, and then you start to make assumptions. Do you have any kind of a qualitative any way, assessment of the quality of the information you have? We've continually heard that well, this is claimant-friendly. At what point does claimant-friendly become very divorced from data? I mean it may be claimant-friendly, but just saying everybody has the highest -- we'll just make up a dose is even more claimant-friendly than some of these others. So that's kind of a -- the first part of it, do you -- do you do that?

And then my second question is, there's been a number of site profiles that we're reviewing or

that we have reviewed. Where would you place this one as far as quality, data and information compared to the other site profiles that have been done?

MR. TAULBEE: Let me answer your first question. We do go through a process, and the purpose of the site profile is to describe the methods that we would use for dose reconstruction. It doesn't detail all of the data that we have used or looked at or analyzed.

For example, at Iowa there is a large volume of pocket ionization chamber data, particularly among radiographer workers, that we didn't even use in this particular analysis. We also have within that same dataset times of them entering into the radiography cell and leaving, so we have time measurements, as well -- they were in this particular cell for a half-hour type of thing. We didn't use that data, as well. We didn't discuss it in the site profile because we don't -- we're not using it, from this particular standpoint. So there is some data quality review that we go through. We know pocket -- or dosimeters, film badge dosimeters

are of higher quality than pocket ionization chamber data. Therefore, since we had the film badge dosimeter during the same time period, we decided to use that instead of the other dataset. Okay? So there is a data review and quality that we do as we're developing the site profile.

To answer your second question -- and I'm sorry, I just forgot what it was.

DR. ANDERSON: Basically how does the quality and the extent of the data used in this site profile preparation compare to some of the other sites, so we can do kind of quali-- qualitatively get a sense of --

MR. TAULBEE: Sure.

DR. ANDERSON: -- how confident are you that you've actually estimated doses rather than just make --

MR. TAULBEE: Okay.

DR. ANDERSON: -- the policy decisions of, you know, protectiveness.

MR. TAULBEE: And I think Jim wants to speak to this, but let me start it. When you compare Iowa to atomic weapons employer, we have a large volume of data compared to what we do

dose reconstruction with from AWE sites. When you compare it to some of the larger facilities, in that early time period prior to 1963, it's much lower than what we see at other -- other facilities. But it's certainly not -- I guess I should just leave it at that. It's not as much lower than what we see -- the big part that we don't see is the actual bioassay data. We do see -- we have sufficient information I believe to estimate that particular dose, but for Iowa we have yet to find any bioassay data. Film badge monitoring is about the same. They were following the AEC manual 524 as to who would be badged and who wouldn't. So it's very common across other facilities to see this gap or this limited amount of monitoring data. Y-12 is another prime example for that, and that would be prior to 1961 at Y-12.

DR. ZIEMER: And Jim, would you like to elaborate on that?

DR. NETON: I'd just like to elaborate a little bit. I think Tim's right on with his response, but I think -- it's hard to compare these different sites. Each site is very different,

and what we find here in Iowa is that the potential for internal exposure we believe was fairly low because of the encapsulated nature of the material. There were no grinding processes going on with these pits, et cetera. Whereas a place like a Bethlehem Steel, it's the opposite. Fairly low external dose potential but huge potential for internal based on the processes involved. So each site stands by itself. I mean you can't really compare the quality of one dataset with the other, I don't think. It really depends on the processes that were employed at the site and what we can do with that as far as a source term calculation.

DR. ZIEMER: Dr. Melius.

DR. MELIUS: I have a few more questions. One is I guess a request for information if you have it on that revised table you put in your slides, the work factor development, where you added the number of workers that were monitored.

MR. TAULBEE: Yes, sir.

DR. MELIUS: Will you also have available -- I wouldn't expect from memory, but the data on the number of workers that had positive

determinations?

MR. TAULBEE: I have -- I have not --

DR. MELIUS: I mean you have the number of positive -- I can't -- it just might be helpful to get a sense of relatively what that proportion is. I don't expect you to have it in your head.

MR. TAULBEE: Yes, sir. Unfortunately I've not gone through and done that type of a tally yet, so I'm sorry --

DR. MELIUS: Well, if you could or if it is available somehow --

MR. TAULBEE: Oh --

DR. MELIUS: -- it would be useful to have.

MR. TAULBEE: Okay.

DR. MELIUS: Okay. Secondly, along this line of sort of how do you go about doing this, and this gets to the area of -- of classification and so forth. I guess I'm trying to understand that in this process that you're going through that -- I assume you're always, in doing a site profile you're always looking for what's the -- the best data is to characterize the exposure.

MR. TAULBEE: Yes, sir.

DR. MELIUS: So though, you know, a source term

type of information may -- along with other information may be adequate, it's not preferable, so you're looking for what is preferable. Detailed individual monitoring data I guess is sort of eventually the -- what you're trying to get at, and what I'm trying to understand, one, is does the secrecy issues related to the site prevent you from accessing or utilizing better data that might be -- that might be used in evaluating or describing someone's exposures at the site?

MR. TAULBEE: Yes.

DR. MELIUS: And then along that same line, it's just getting a sense as to what extent the classification impedes our ability to -- for you to present, I guess, this information to us and for us to -- who are not -- don't have the appropriate clearances to understand the scientific basis for this, so I guess they're sort of two separate but related questions.

MR. TAULBEE: Okay. With regard to the issue of do we have better data such that we could estimate the doses more accurately, yes, we do. The problem is is that if we were to do so, all we would be able to give you is the annual

dose.

DR. MELIUS: Uh-huh.

MR. TAULBEE: There wouldn't be other information associated with anything else, and that's as transparent as it would be.

DR. ZIEMER: Did you have a follow-up on that?

DR. MELIUS: No, that's...

DR. ZIEMER: Other questions or comments from the Board?

PRESENTATION BY SC&A

DR. ZIEMER: If there are no further questions or comments, we're going to continue with our review by our contractor. John Mauro's going to make a presentation which -- this represents a summary of the review that they've done, pretty much on an accelerated basis now, since our last meeting. John, look forward to hearing from you here.

DR. MAURO: Good afternoon. My name is John Mauro. Many of us have met before. Before I get into my presentation, this may go on -- maybe it doesn't need to be said, but when I'm in a situation like this I ask myself the question, okay, let's say I'm a worker. I've come down with a cancer and I worked at this

facility for some time period, whether it's pre-'63 or post-'63, and as a health physicist who's read all this material, listened to a very impressive presentation and been giving a lot of thought to this particular problem over the last month, I say to myself -- and I'm -- but I'm a, you know, a -- a claimant -- am I convinced? And what do I say, well, what do I need to be convinced that I feel as if I've been treated fairly, especially since I have this background in this area? And right now, as we stand here today -- and now speaking for myself -- is that I've got a lot of questions, and I'm not entirely convinced that if I were denied on the basis of the information that I heard here that I would feel as if I was treated fairly. Okay?

And I think it's -- it's sort of really common sense, but -- and I'm going to try to give you my reasons and our reasons, and I'm going to ask several of our folks to come up because, you see, right now what we have here is we have a crew of four people that have written the report -- the reports that you have before you, and it was very much a collaborative effort.

I'm here before you to speak because I was sort of the point man, carrying the flag. In fact, I took the first run at writing the report that you have, and then we went through a loop, a iterative process, and everyone has very, very strong feelings and brings to the table lots of talent that's -- that complement each other. But I'm going to sort of get the ball started and then I may pass the baton to some of the other folks who have deeper insights into certain issues.

So with that as an introduction, I'd like to go to the next slide.

As you all know, the Rev. 0 came out quite some time ago, April 16, 2004. This is sort of my excuse table. Okay? This is my -- we started work -- we got the green light on March 14th. Okay? And we said John, hit it. We put together our team and we started to read everything, and -- and we try to digest as much of this materials as we could, and then we -- what you see is a very intense schedule where we had people mak-- performing interviews of workers. We're reading, we have people getting their Q clearance in this time period. As soon

as the Q clearances come through, we have people that went, along with other members of the Board, to read as much material as they could in about a two-day period.

During this process we're holding conference calls with the Board and representatives of NIOSH and gathering information, so we're on the sprint, and then on April 18th we deliver the report you have. And then of course -- and the interesting thing about this whole process is, I really didn't have a chance to talk to Joe Fitzgerald and Kathy DeMers until the very end of the process because they were locked away from us. And in fact, the report -- relatively brief report that you received, about the 20-page report which represents our recently-cleared document, it wasn't until Thursday of last week that Joe and I finally had a chance to talk to each other. And all sorts of lights start going off, we start to realize things and learn things. So we're in a very intense process and today I'm before you to try to communicate places where we feel NIOSH's case is really tight and they did -- in other words, I'm convinced, as best I could be

convinced, given what we've went through -- and other areas where I'm not so convinced, or perhaps we're not so convinced.

And first and foremost, normally we would take at least two months to go through -- to get to the point where here -- or maybe even three, given that we're dealing with classified documents. The product you have right now in front of you is what we normally would have called a preliminary working draft for the purpose of delivering to NIOSH for factual accuracy review. Then normally what we would have done is have a -- an open meeting that would have been recorded where we all had a chance to ask each other questions, discuss some of the issues. So really what's happening now is we really have accelerated the process. And in fact I'm very anxious to get feedback on some of the factual accuracy issues that perhaps we missed, or places where we might have got these right. But right now I'm going to communicate to you where we are right now at this point in time, given that we really haven't read every document we wanted to read and we did not have full and unencumbered

access to information. There's still a long list of documents we would like to look at. There's a -- we've learned that there are a lot of records out there over and above the records that were looked at by -- by NIOSH that would be a pretty good idea for us to look at. There are a lot more people we want to talk to.

I haven't seen the results of the interview record. I don't know if you're aware of this, but when we had our team of people interview many of the workers, they took notes. And normally I would have -- we would have access to all those notes. But what happened was those notes were confiscated and had to go through a clearance process, so -- which is -- so we don't -- we are just now getting access to that information. So what we are -- we're sort of stepping in the middle of a process and what I'm going to give you now is a -- a picture of what we see. I'm trying to make it as clear as we can, and in some places we're going to be right or strong and in some places we're going to be weak, but it's -- my intent is to be as helpful as I can to understand what do we have here. Next slide, please.

All right. When you read the Rev. -- by the way, I did not read Rev. 0, so I didn't have the benefit of Rev. 0. We hit the street running. On the 17th we jumped right on Rev. 1. Okay.

What we -- what I've done -- done here is simply say well, this is the report. The report basically is divided into these different sections, and what I -- what I'm going to do is give you a first -- initial impression, after one month's worth of work, where -- where I think each section lies. And the first chapter that's of -- you know, that's important to talk about is the occupationally-related medical X-rays.

Well, it turns out that evaluation was your standard section. We've seen that section before. We've seen that approach before and the way in which they did their -- they do their dose reconstructions. And like many of our other reviews of that section, the major concern we have with that section is it leaves out the possibility of fluoroscopic examinations whereby the -- so I would say if

there's any significant concern that we have, observation with regard to the first chapter on occupationally-related medical X-rays is that it treat-- it does the posterior/anterior dose reconstruction for chest X-rays, but it -- given the time periods we're talking about, we were surprised that there was no discussion of fluoroscopic examinations, which as you know, per examination it gives a much higher dose than a typical chest X-ray. But that's our first impression of first item.

Now we're going to talk about the occupational environmental doses. When you think about the operations at this facility's -- the way it -- the little -- the model you build in your head about -- you know, as you're reading and you start almost trying to visualize, what I visualize is that there were people who are what we call Line 1 workers. We're going to put them aside for a minute. I'm going to get to them because that's where I think the real issues are, but there are all these other people that were working at the site, working outdoors, doing a whole array of things where they were exposed to both external exposures

and potential internal exposures. And that's the chapter that they call occupational environmental dose.

Within that category it's convenient to think of two different kinds of groups of workers. This is how I've done it for myself. That group of workers that were really -- had very low potential to experience very much exposure and -- because they did not -- were not up close and personal and visiting on a periodic basis these storage areas, I think they call them igloos, because here's where perhaps hundreds of these pits were stored. If you go inside one of these pits, that's -- they're calling that an environmental dose. So I find that -- if there's any place where there is a problem with regard to wow, somebody could have gotten some pretty high doses, it -- in the chapter called occupational environmental dose, it's what I call -- you see the -- notice underneath that heading, the second bullet heading, I have a -- I bolded "External exposures, non-Line 1 workers". I bolded that because within that chapter, that's the place that drew my attention and drew all of our

attention especially.
Now we've heard a lot of discussion about tritium exposures, internal exposures to tritium. And the way in which the tritium exposures may have occurred for the occupational environmental doses is people are working outdoors and these various facilities -- these Gravel Gerties, they were handling tritium and it was being vented, so it's going up into the atmosphere and being dispersed, and then there might -- there are people outside that could be exposed and inhale the tritium. Well, there's no doubt in my mind that the way in which they modeled that -- those exposures were grossly conservative. In other words, they didn't underestimate those tritium exposures, I'm positive of that, as long as the source term that they used, the number of curies per year going out, was -- were reasonable. We did not check to see if in fact the number of curies per year being vented out of these units into the atmosphere was in fact a reasonable upper bound. But one thing for sure, the way in which they modeled the release of the material, its dispersion in the

environment and then exposure of a receptor, was extremely conservative, by perhaps two orders of magnitude. So I'm not worried about that tritium exposure. I'm -- I'm convinced. If I was -- if I worked there and someone told me that well, the only exposure, you know, that I knew I was outdoors and the only time I got exposed was to this tritium, well, I got to tell you, I would buy it. I'm saying there's no -- I don't have a problem.

Let's move on to the occupation-- no, no, I'm sorry, we'll stay with the slide for a while 'cause I'm going to set the stage 'cause it'll eventually -- going to zero in on where the action is.

DU exposure. Another thing that went on outside is they -- there was a -- they burned -- a burning pits. They burned these explosives which has commingled with them some depleted uranium. They ran -- they ran some models and -- and from what -- what I read, what I saw there, the way in which they treated that problem was -- was reasonable, science -- scientifically sound and claimant-favorable. In other words, given that the quantity -- see,

what they did is said all of the uranium that was being commingled with the explosives outdoors, when that was burning, all of the uranium became airborne, vaporized, became airborne and it was a -- they -- in a very, very fine form that was highly respirable, and then they did a atmospheric dispersion calculation. They said let -- to calculate what the dose would be to this guy outside who might be exposed to this airborne plume. I have to tell you, I'm okay with that. Okay? I -- I find that approach to what they did reasonable, scientifically sound and claimant-favorable.

We had a couple of minor comments. For example, well, we noticed that they used a certain particle size distribution that could have been a little bit more claimant-favorable, but you know, given the fact that they did not take credit for -- for example, when you have a burning pit -- not pit, but a burning area, you get plume rise. Okay? They didn't take that into consideration. Plume rise from the heat will increase dispersion. So I walk away from that -- now remember, we spent one month. We

had to say what are we going to look at closely and what are we going to say well, this looks okay. I would say that this exposure to DU from burning sites, probably okay. Move on. Ingestion of DU in drinking water. Notice we're still under occupational environmental. Well, one of the things that they addressed in the report was that well, listen, you've got all this uranium that's being burned with explosive all over the ground everywhere -- garage areas -- and it's raining and there's runoff, and the runoff is carrying the -- the -- is running off to a nearby drinking water source called Mathis Lake and this -- and they say well, listen, is it possible that there's some uranium finding its way to Mathis Lake at a concentration that's unacceptable. They took a number of samples over the years from Mathis Lake and they -- they -- they measured the amount of uranium in that water and they found out that the concentrations that they've been looking at in the drinking water from Mathis Lake is really no different than it is in background levels anywhere in the United States. I walked away from that. I accept

that. I said I'd buy that. There really was not mu-- if there's a problem with this site, it's not that. Okay? Let's keep going.

All right. Now we're going to go to the next -- the last item under occupational environmental, external exposures, non-Line 1 workers. Bing, here's our first problem area. Now I want you to visualize this.

You've got this building -- large building, and I don't -- I don't know exactly what it looks like, but apparently they stored hundreds of -- of pits, nuclear warheads, inside the building. Okay? And apparently there were film badges that were hung inside the -- this building and collected data. Every two weeks they took the film badge out and they read it out to see how much dose over that two -- two-week period each film badge experienced. And the data show that the doses or the exposures of the film -- those film badges -- there were a lot of them -- ran from about 100 millirem over a two-week period, two week being continuous two week, up to over two rem over that two-week period.

Now not much is said about that in the report, and here -- now -- now I say to myself, if I

were a security guard and I worked at that site -- now I don't know if this went on -- and I was inside there with my gun, securing that for eight hours a day -- I don't know if this happened, far as I can tell, the report is silent on this particular issue -- but all of a sudden, what we're saying is oh, so in theory I could have gotten two -- over a two-week period, I -- remember that's two contin-- that's two weeks continuous or -- which -- whatever number of hours that is, but if I'm a worker, I'm there eight hours a day. So in other words, some fraction of -- of two rem. Okay? I don't know what the numbers go -- Hans, do you know off-hand what we're talking about? If we're -- instead of being -- what -- instead of being a full two weeks it'd be there about one-third the time?

DR. BEHLING: (Off microphone) It's 0.2374.

DR. MAURO: About .23--

DR. BEHLING: (Off microphone) (Unintelligible)

DR. MAURO: -- point -- 230 millirem.

DR. BEHLING: (Off microphone) About (unintelligible).

DR. MAURO: Okay, about a quarter of that dose.

Okay. Now -- now, so he's in -- let's say he's in there, okay? And he gets that photon dose from the -- what's coming off the -- these pits. But then you have to remember -- now he -- we're -- those film badges are missing the low energy photons. We've got to multiply that by something like 2.2 because we're missing that americium component, so the dose all of a sudden goes from 200 millirem to maybe 400, 500 millirem in that two -- in that two-week period.

We're not done. We're saying but wait a minute, he's also getting hit by neutron exposures, and we know that the -- that the neutron to photon ratio that they used is .79 -- by the way, I buy that. I mean I'm -- as a health physicist, I looked at what they did. We modeled everything like they did and we came up with neutron to photon ratios ourselves from this generic pit. We looked at what -- the data they had and as far as I'm concerned, they picked a good number there. That .79 is pretty good.

But what this means, though, is beside that 500 or so millirem per two-week period, this

person's also getting -- you multiply that by .79 and so you're getting another 300 millirem on top of that. And then you've got to multiply that neutron dose by 1.9 to convert it to, you know, effecti-- you know, the -- the quality factor, you know. In other words, this -- this -- you know, a rad of gamma then to a rem of neutron, so you multiply by what -- this 1.9 factor.

Bottom line is this. Now I don't know if this happened there or not, but again, think of it like this. I'm -- if I was a worker and I knew that I worked there and I was a security guard and I spent a lot of time inside that building, what do you get -- Hans, you ran the numbers. What -- what kind of doses would this guy get at the end of a year of work?

DR. BEHLING: (Off microphone) 27,000 to 54,000 millirem --

DR. MAURO: Okay.

DR. BEHLING: -- (unintelligible).

DR. MAURO: Right, which is much bigger than any number that's anywhere in the report. Now I don't know if it's true. Now I -- you know -- you know, we'll talk -- I'll talk to Jim.

Jim, this the first time you're hearing this and -- at NIOSH. Now I don't know, maybe these guys didn't stay inside these -- didn't go inside -- maybe they stayed outside. There was a locked door and they just stayed outside the locked door. That will be -- it's a different story, but -- so my first concern is that. I said -- bam, I think -- this one is the one I'm nervous about because thi-- now we're talking about doses that are substantial -- if in fact that scenario that I just invented actually occurred. Or even if it occurred only partially, where a person maybe didn't spend eight hours a day inside, but maybe three hours a day. We're talking about big doses now. I'm going to leave that section on occupational environmental doses now, and we're going to move into internal exposures of Line 1 workers, the internal exposure again. My only criticism of this part -- now -- now we're at -- see, now we're Line 1 workers. We're no longer outside. We're inside this Gravel Gertie and we're doing our thing inside the Gravel Gertie with the pits. Okay? And -- and a person could theoretically -- the question is could he be

exposed. Now one of the things he could have been exposed to is tritium -- remember we had the tritium going out the vent. Well, he's in the building now handling the containers that -- where they're opening the bottles, whatever these thing -- these JP containers, and there could be some airborne tritium there where he's working.

We looked at the assumptions that were made to predict what the exposures might have been to the Line 1 workers inside that were handling the tritium. And given that their -- the characterization that NIOSH presented of the quantity of tritium -- in other words, that were inside the headspace of these containers was in fact 90 microcuries per cubic meter and the number -- and they opened two of these a day, I believe. What they assumed is all of that activity becomes airborne in this -- the -- this Gravel Gertie over -- and a year's worth. It's never vented. It never leaves -- never leaves the building, and it just keeps accumulating over the course of a year and it stays there.

Well, let me tell you something. You can't get

more conservative than that. I mean to the point where it's unrealistic. That does not happen, but that's the assumption they use, so they bound -- they bound that tritium exposure indoors to the Line 1 workers, as far as I'm concerned right at the -- right at the -- you really can't be higher than that, so I'm okay with that one. In other words, I walk away saying they're really putting upper bound -- given that -- we have to take on face value that they opened two of these JP containers a day, given that the JP container headspace contained no more than 90 microcuries per cubic meter, and given the volume of the headspace, which is small. Given that, the assumpt-- the model they used to predict what the exposures might be was certainly conservative. Okay. So I'm okay with that.

We move on to DU and other radionuclides. Here -- internal exposure, Line 1 workers. Picture the workers -- they're doing stuff with this pit. I can't even imagine what I -- that -- the action doing that kind of work, but -- and -- and -- the question is, is it possible for there to be some internal exposure. What we're

told in the report, Rev. 1, that they took some wipe samples -- okay? -- and very rarely did they ever really see anything on the pits. There was not much contamination of any plutonium or -- or uranium or deple-- you know, so the amount of -- so the argument is that well, there was very little likelihood of internal exposure. I -- I would have liked to have seen the results of the wipe samples. In other words, the box of data that was mentioned earlier by Tim, apparently there's a lot of data in there on what swipe samples -- I'd like to know what samples they took, what was the lower limit of detection, what they were looking for, so I could put an upper bound on what might have been on the outside surfaces of these naked and not naked pits so that I could at least get an upper bound and convince myself. But I have to say my intuition tells me it's probably right. But it's hard to say something here -- as a health physicist, you know, we're -- with limited time and limited data, I -- I look at the arguments being made. I would like to look at that data, though, and do some calculations and convince -- you know,

based on the swipe samples what do they see, how many do they take, how many did they see detectable levels, what their lower limit of detection was, what were they looking for, and put this one to bed. But right now I have a question mark there.

Radon, I have a real problem with the way they approached radon, and I think Jim would agree. (Unintelligible) agrees. You know, they actually came up with a -- (unintelligible) didn't do a radon concentration in the report that was something like 1.3 picocuries per liter. That's what I've got in my basement. I have a standard, wood frame house in New Jersey, which is a fairly high radon area. I can't imagine with it now being in a structure that it sounds like it was underground or partially underground or largely underground. The radon levels could easily -- I mean I'm very familiar with radon levels throughout the United States, I've been looking at it for years -- could easily have been 100 times higher than that. So I'm not at all happy with the radon part. Okay? I'd want to do a lot more homework on indoor radon. And we're

talking about some substantial doses to the lungs.

Now, by the way, that has nothing to do with the op-- what they were doing. It's just that they -- it's a NORM, naturally occurring radioactive material, that they happened to put themselves into a situation in a structure that, because of the very location and nature of the structure, there's a real good possibility that there were elevated levels of naturally occurring radon. It wasn't because of any radium 226 that we're handling. It's just -- the radium in the soil is generating radon, and especially if they vented this -- in other words, if this Gravel Gertie had a vent, was venting air out, what you do is you create a delta P between the indoor and the outdoor and that just sucks the radon right in. That's what happens in anybody's house. And if it happens to be you're in a naturally high radon area, you could have a pretty high concentration of indoor radon in a situation like this, another item that I'd be interested in looking at.

But now we're going to get to the real -- the

next bullet, external exposures of the on-line radiation workers. Here's where (unintelligible) -- where the real issues are, as far as I'm concerned. By the way, the last one, shallow doses, we all know that's on hold so we're not going to even talk about that.

So let's go to the next slide. Now, when all is said and done -- when all is said and done, visualize you're a worker. Okay? You worked any -- any one of those years. What the guideline says -- what the -- what the -- the TBD says -- we're going to use this -- if we don't have data for you -- in other words, we don't have a full year's worth of film badge data, we're going to go in, try to say -- and if we don't have it, we're going to use this table as a default surrogate for you. Okay? I have to say it's a very interesting approach, some of which is -- I'm not too comfortable with, and let me explain why.

Let's start off with the left-hand column. You'll notice that the total number of monitored workers, 1962 -- you can start seeing -- it's 29, 41, 36 -- let's talk about 1962 for a minute. In effect what's -- they're --

what's being said is -- well, no, let's -- let's go to '63, I'm -- we're going to get to '62 in a minute. Let's go to '63. It's my understanding of reading the TBD that from 1963 onward they're going to use the actual data, film badge data that people had, and if the person didn't have any measurements -- and apparently 95 percent of them did not have any measurements -- so in other words, what we have is -- there were 41 people in 1963 that had measurements. Whether or not they were full -- a year's worth -- in other words, that have a measurement taken every two weeks for the entire year so I can reconstruct his dose, but -- but the odds are most likely the guy that's going to show up who was exposed in 1963 -- well, only five percent were measured at all, so what we're saying is most of the time, for someone exposed in '63, we're going to have to do something as a surrogate, to fill in for this guy. And the approach that they decided to use was to say okay, we're going to go with two -- the number is 2.9 rem. Okay? As being the -- so we're going to fill in for that year. So if we had no data on that guy -- and this is

my understanding of the report -- we're going to say he received that year 2.9 rem.
Am I -- do I feel comfortable about that? That is if I was that person. The -- and by the way, that 2.9 rem reflects the following: They took -- notice that there were 295 measurements. You see -- if you'll follow across on the 1963 row, there were 295 film badges where they took out the zeroes, so these are the non-zero badges. And then they plotted it on a -- on a lognormal -- (unintelligible) paper and they got a straight line, and -- and they come up with a geometric mean, a geometric standard deviation, and what they're going to assume is that the exposure I got that year was the geometric mean of that distribution. Well, that means that I have a 50 percent chance of being less than that and a 50 percent chance of being higher than that. Don't like that. I don't feel as if you've given me the benefit of the doubt.
I would have much preferred two things. One, I would have preferred if I was sure that the 41 measurements that were -- I'm sorry, the total number of people, the 41 people -- that those

41 people represented me. In other words, those were all the guys that worked with -- that stood right next to me doing the same exact thing I did, maybe on Line 1, working with one or two pits or whatever they did, that those 41 people were a good surrogate for me. I don't know if they were or not.

Now for the first time Tim presented the bar chart that -- and Mark, you had a lot of questions about -- not the bar, the pie chart, very important chart because you see, if we have really good, rock solid information on the different categories of workers and we know we have a good databa-- even if it's only a partial -- that is, let's say only some of the workers, but we have a good cross-section that we could use as being a surrogate. So I would say to you I would be -- I would accept -- if I was a 1963 guy and you told me yeah, we've got -- we've got 41 people that came out of -- they all did the same job you did, and we come up with -- and a geometric mean of 2927 of the dose to those 41 people, I still wouldn't be happy because I wouldn't want you to use 2927. I would want you to use 95 percentile value.

Then I would say all right, you gave me the benefit of the doubt.

So I have two problems with the approach that NIOSH has adopted. One is the presumption that those 41 (unintelligible) of people represent me or -- you know, I'm -- they are surrogates for me. I don't know that. If they are, great. I'm ha-- then I'm halfway home.

My second problem is, given that they are a good surrogate for me, then I don't want you to use the geometric mean and standard deviation to represent my exposure that year. I want you to use the 95 percentile (unintelligible). This is me and this is what I would want to see.

So -- so in effect, my problem with the -- with the post-'62 time period is those two issues. One, we have to be confident that when you're doing a real person that you have no data for that when you decide to pick a surrogate that you pick a surrogate that represents him. And not only that, once you have that, that you have enough data about him and the people that were like him, then I would want you to pick off the 95 percentile. Then I'd be okay.

Right now I don't know if that's -- I don't think so.

You know, maybe in the later years, you know, to get -- another way to look at it is well, wait a minute, hold it, let's go to 1972. We've got 312 people were monitored. Well, you know, out of those 312, it might be possible to sort them out into the different work cate-- worker categories. And if it turns out the kinds of things they did in 1972 were more or less the same kind of things they did in 1963, well -- well, maybe we could build a surrogate from the 1972 data to serve as a representative of the early data, but I don't know that 'cause I don't know if the things they were doing in 1972 bore any resemblance to what they were doing in 1963. There's no way to tell from reading that report. Okay? So -- so my -- so -- so if -- if NIOSH said well, we're going to use later data to construct -- to do -- to reconstruct earlier data because we have a lot more data, I would say great, but you've got to make a case that -- that the later data is in fact a good surrogate for the earlier years. Now -- so that -- that's my concern with the

post-'62 dataset and how it's being offered in the Rev. 1 TBD.

Let's go to the pre, and things get a little bit more interesting and a little bit more difficult to appreciate. What we're saying here is if it's pre-- if it's 19-- well, if it's 1962 or earlier, it's a given. This is your Hp(10) -- see the list of numbers starting from 1949 right up to 1962? That's the dose -- the geometric mean of a dose, Hp(10) dose, that we're to assume you got. All right? A pretty big dose. And on face value, as a health physicist, I said well, one of two things. One of two things. Either there was some very strange things going on be-- from going from here to here that they did a lot -- and I have no idea, I'm not -- you know, what -- what happened, that mean -- if that's a realistic treatment of the problem, my God, what was going on in 1949 to 1962 that was that much different, a factor of ten different than after that. So right after that, that makes me wonder if -- make -- you can argue well, that's proof that it was very conservative what they did, the generic pit you would argue is very

conservative. But I have to say I'm a little more skeptical of that, and now we're going to talk about the generic pit for a minute. My understanding is -- is the following: That NIOSH looked at all of the pits, and from that they constructed a generic pit that is -- doesn't represent any real pit, but it's a pit that would deliver the higher -- a very high dose rate at one meter away. Joe Fitzgerald and Kathy DeMers, our two Q-cleared people, went in, spent two days, and one thing they walked away with. Without a doubt in their mind, that's a conservative pit. In other words, it turns out the 33 millirem per hour, which the generic pit represents, the naked pit, that dose rate's -- as far as our -- Joe and Kathy are concerned, they buy it. They -- they are convinced that that is an upper bound representation of what the dose rate might be. But what they're not comfortable with is the work factor. Okay? In effect, the work factor is a way to adjust down. In other words, they multiply that dose rate, that 33.3 millirem per hour by .153 and say -- 'cause that's like your -- the -- NIOSH explains it well, we -- we

really don't believe these people were exposed to 33.3 millirem per hour eight hours a day, 2,000 -- 2,000 hours a year. It was something less. And they went through this (unintelligible) era description, which I don't understand, so we have to take that on face value that there's some secret stuff there that we don't know about. But -- but in the end, what it really means is effectively what they're telling us is that it's -- for all intents and purposes, what this means is that -- that the person that's exposed effectively worked one hour or so a day one meter away from this generic pit. We -- we are ready to get behind and say that generic pit's a good pit, for two reasons. One, Joe looked at it and, based on the design, he says that bounds it. We ran -- given that design, we ran MCNP and we came very close to that. We actually came up with 45 millirem per hour instead of 33, but given the uncertainty, we -- so we're convinced that that's a good number, but I have to say we are not prepared to get behind the work factor. We don't know if that's a good number or not. So -- so that's one of our first and more

important concerns.
Also, a lot of our concern is that it seems like there's a lot more data out there, and -- and they -- and they -- and they went into this model. From my understanding of the regulations is you exhaust your data as best you can before you go to models. It seems like that they leap to models pretty quickly. I would have spent a little bit more time looking at the data, so that's like one of our observations.
But anyway, so you -- in the bottom line, this is your handy-dandy look-up table on how to do dose reconstruction, and a -- our two concerns, this -- the key points we're making is for post-'62 I'm a little concerned about whether or not you can actually come up with surrogate data because of the limited number of measurements. And I'm a little bit concerned that they used the geometric mean as opposed to some higher end value for the distribution to reconstruct my dose.
For the pre time period, I'm concerned that I don't understand that work factor and I can't get behind it and know for sure. Although I've

got to tell you, those are pretty big doses, you know. So you've got to say -- you know, you have to accept that.

Let's go -- last slide -- next slide. All right -- and that'll get to the bottom line of what we found out. One, the generic pit is likely to bound external doses to Line 1 workers. We're good.

Oh, by the way, this is -- one of the points that we're -- that's in here that Joe pointed out and -- basically -- in effect what this says, number two, is that there's actually newer dat-- remember I talked about this neutron to photon ratio where they got that ratio from the Pantex, well, apparently there is more data out there that Joe is aware of -- became aware of, and apparently -- now I don't know if anyone has looked at that data yet, so one of our -- one of -- and Joe, correct me if I'm wrong -- right now I'm prepared to buy in on the .79 neutron to photon ratio, but apparently there's more data out there that's worth taking a look at which would help to further convince us that that's a good neutron to photon ratio.

Number three, this is the work factor issue. We cannot verify that as claimant-favorable. We were -- we just did not have enough time to dig into it and understand it fully, that in fact it is reasonable, if not somewhat conservative term in that equation.

Number four, the exposures associated -- and this is what I mentioned earlier -- with the -- that might have occurred associated with the pit storage areas, we're -- we're -- we're not su-- we think that that might be an important source of exposure that has not been properly explored.

We talked about the adequacy of the post-'62 film badge data. You know, very little -- very few measurements were made '62 to '67. Can you do very much with that by way of reconstructing doses to people who don't have any data, we're concerned with that.

Another general concern is that excessive use of models when apparently, from our interviews, there's a lot more data out there. Based on the interviews with -- with workers, apparent-- and some of the work we've done so far, sounds like there's more data that -- especially like

these swipe samples, that could tell us some more -- that we need to look at and -- and the way we look at it, the way we interpret the regs is that you're supposed to go -- your first priority is to the real data before you jump to models.

Number seven, this is a ve-- this is almost a philosophical question. Now this is what came out in the letter that was sent out on Saturday to you all. I don't even know if you had a chance to look at it, but it's a very interesting -- almost a policy question. What -- what's happened here is for pre-'63 a model was built, a very conservative model, by the way. We don't know whether that model is scientifically valid. We believe it's conservative, but is it a reasonable upper bound representation of what transpired pre-'62. So the question is, is that -- is that appropriate. You know, when you read the regs, when you go to a surrogate approach, when you go to a model, it's my understanding that you just can't pick any -- a very bounding design, upper bound, 'cause you could always make it worse. And -- and -- and then I was thinking

about why is that a problem? Well, I picture two people, one -- let's say we have this bounding pit, very, very conservative and is -- and is based on -- let's say let's make sure it's conservative, and then based on that pit I get compensated. Okay? And the guy that's next to me, though, he doesn't. And he says well, listen, well, why didn't you make it a little more conservative? If you made it a little bit more conservative you'd have covered me, too. So it seems to me, and this is an interesting thought -- NIOSH sort of has an obligation to, when they build a generic surrogate to deal with a situation -- this case happens to be the -- the classification issue, they had to do that because of classified -- but I could see the same situation arising with -- let's say falsification of data. Let's say oh, we can't use that data, it's been falsified. Well, you know what we'll do, we'll build a surrogate (unintelligible), you know, that we're sure is bounding. Well, you know, when you start to do that, how conservative do you get? It seems to me you have an obligation to make it conservative, but it has to have

some scientific validity, that is there some statistical basis that you placed an upper bound in a reasonable way. Because otherwise, if it's -- if it's a little bit arbitrary, you could always say well, let's be a little bit more arbitrary and then give the ben-- even more benefit of the doubt so that even more people get compensated. So you're going down a path that's kind of strange. And do you -- I don't know if you understand where I'm going with this, and I -- and I -- it's a very thought-provoking piece.

And finally, we -- we feel that all potentially relevant records, classified and unclassified, we really have not had a chance to review to the extent that we normally would have reviewed them.

And I think that's the end of my story. Joe, Arjun, Hans, please -- you know, 'cause -- you know...

DR. ZIEMER: Joe Fitzgerald doing follow-up here. Joe?

(Pause)

MR. FITZGERALD: Thank you. I'm Joe Fitzgerald. I led the team that spent some

time looking at the classified information in Germantown, Maryland for a couple of days. And we also had the extra advantage of having basically worker interviews that were conducted rather extensively by my colleague, Kathy DeMers, who I'm sure a lot of the workers certainly know. And we certainly have a perspective that's probably overlaps but is decidedly different than the one John is referring to, and that was done, you know, rather purposefully given the time frame that we have. And I just want to really accentuate some of the issues that John certainly outlined here.

You know, we went into the review certainly as a first priority to -- to validate the technical adequacy of the models that were being presented. And given the time frame, that was probably our first order of business. And I won't go into too much detail, but just to say it was a rather exhaustive review because certainly there was a lot of questions and a lot of concerns over the parameters of the bare pit represented and we certainly wanted to spend time doing that. And the

report that documents this portion of the review is available. It's out there. It's about 20 pages long, the actual review portion is about ten or 11 pages. That was intentionally kept short to clear the Department of Energy reviewers, classification reviewers. But you know, we, again, very purposefully wanted to nail this thing. And we looked at the parameters. Okay? We looked at mass. We looked at the radioactive components, the pit geometry, looked at the cladding issue, the isotopic composition, impurities. You know, we asked all the questions I think a lot of the workers certainly had and a lot of the questions that we, as a review group, certainly had. So, you know, certainly we spent a great deal of time -- in the day and a half that we had, a good portion of the time trying to validate that the models themselves were conservative and ultimately upper bound. But in doing so, and I think the report's clear, I think we felt that in going through that rather detailed analysis that in fact we felt it represented a conservative model, we were troubled in a sense that this is the first

opportunity that we have had to get into the -- I guess the classification issue, the notion that one will have to deal with classified data as part of the process that all of us are working with. And I'm very familiar with classified information having spent a great deal of time in Department of Energy. But in this particular context it's particularly troublesome because in a sense it represents this extra scientific -- a factor X, if you may -- that one has to accommodate. And in doing so -- and I think this was raised a little earlier -- it's unavoidable. And first of all, it's -- let me just first say it's very legitimate, very important that this be done. And I think there was a great deal of care taken in doing this. But in doing so there's uncertainties introduced. There's certain uncertainties introduced that have to be accommodated, and this is something that puts the process into sort of unknown territory, in a way. It's not something that is defined in the Act, not clearly addressed by the procedures. And so when we're looking at this and trying to figure out, you know, were these

best estimates and trying to answer our charge to the Board, it was pretty clear this was something outside of that. But yet accommodations -- and I would say significant accommodations were being made which provided an influence, a perturbation on the final answers, on the models that I think raises what I would say some pretty significant policy questions about how that plays out in the final answer. And I -- I want to be rather opaque about this because to go into any further detail would be -- would be probably kind of dangerous in the sense it'd be hard not to inadvertently trip into it, but we did identify that issue as, if you may, a sidebar policy question that there were certainly uncertainties that -- that could not be articulated and yet were very important to the final answers, the ones that you in fact and we in fact have looked at in terms of these models.

So yes, they do represent upper bounds -- we -- we thought, and I think certainly the Board members who were with us can corroborate, as they -- they may, that they -- that they were

technically valid, but yet we have this big issue.

We went further than that. We had certainly the benefit of extensive worker interviews, and I'm sorry Kathy couldn't be here, my colleague, but we spent a great deal of time with the workers over the very limited time that we had. We only had a few weeks, but I think she probably covered -- I heard this from some of the workers -- more ground than one could imagine. And in that process we were troubled again, and I -- again, this is not a long time to go through the paces, but we were troubled because in looking at things like the work factor we could not marry up what we were hearing from the workers -- and these are -- more than one workers, this is corroborated across five or six or seven or eight workers, so this is a pretty significant sampling of the people that had first-hand knowledge of the operations. And we found this for the other reviews, as well. But we could not corroborate, couldn't marry up their experience with a number of these parameters, and I think fundamentally the work factor that we had the

most trouble with. But when we talk to the workers, we hear that, you know, it was commonplace to in fact be in proximity with one, two, (speaker moves away from microphone) in some cases with some of the people that were familiar with the (unintelligible), multiple arrays of pits, (speaker returns to microphone) yet the work factor focuses on one pit at a time. Okay? Felt that was not an insignificant inconsistency, one that -- you know, we don't have anything else to go by. There's no (unintelligible) of procedures. There's -- you know, procedures could not be located. There's nothing hard. What we really do have is the body of the worker (speaker moves away from microphone), remembrances, recollections, and the actual experience (unintelligible), and that did not match up. (Speaker returns to microphone) We had this experience about the proximity, the distance to the pit, and we very pointedly asked them (speaker moves away from microphone) well, what's the -- what's the handling of a pit, what happened day in and day out, same questions I would certainly expect NIOSH to ask

and we sort of expected answers that would (unintelligible) with what we were seeing as work factors.

DR. WADE: Stay close to the microphone.

MR. FITZGERALD: Oh, I'm sorry.

And what we were hearing was, you know, no, it -- a lot of direct contact. Certainly an hour a day -- I had a couple of workers almost laugh in my face about the notion that it was limited to such a small fraction. And looking at Pantex experience where in fact one had to go to lead aprons because the exposure got to be considerable at the trunk level, you know, it sort of struck me that yes, there was some resonance in the fact that, you know, this question of the parameter of proximity, the duration of time, the numbers of pits -- these are all very important questions. These are very influential issues.

Now it was one question to say, you know, the bare pit is conservative. You know, that was sort of the primary we went into looking at. And I have to say it was well thought out. A lot of homework was done with DOE and, you know, it was a creative solution to it. But

when we went further and got into the work factor, you had to go to the workers for that. There just isn't anything harder, nothing that's probably more important, and we really couldn't marry that up very well. So again, that -- that issue was certainly one -- and I want to emphasize, it was a very important issue, and one that we sought to substantuate (sic) further with the additional workers that we talked to and we could not substantiate those parameters that are associated with the work factor with any of the workers. Okay? And that -- that really I think was a troublesome issue.

And certainly going further than that, you know, we saw the area monitor data for the storage areas. And some of you may be familiar with the experience at Pantex when the Cold War ended and you start piling up pits in the storage areas at Pantex. One of the biggest issues is increasing ambient level of exposure that was taking place in the igloos and the storage areas and what to do about that. That was sort of in the late -- early '90's that that issue had come up. And so it's a very

significant issue in terms of -- of -- of both understanding and also reflecting what the high level of exposure means. And I think in the case of IAAP we didn't get any disagreement that there was a likelihood that in fact this multiple array of pits being stored in various locations did represent a substantial source of exposure if in fact the worker -- in this case a guard, unmonitored guard -- was in the wrong location. Okay? And I think it was pretty clear that, depending on the time of year, that worker might very well be indoors than outdoors, or be closer to the multiple pits than the area monitor itself, which is positioned on a wall in the storage area is. Now recognize that the -- this -- the area monitor is our best measure of what the radiation field was in that storage area, and we're getting fairly high measurements. I guess it was something like as much as 18 rem a year, which is a couple millirem an hour, but if you're a security guard and you're positioned at a location in fact closer to that array than that area monitor, in fact your exposure may be very well higher. So we're

seeing these degrees of uncertainty that frankly we could not find a way to explain it out. Okay? So we're really -- given the time we had, it wasn't very long, we wanted to test these -- these postulates, the assumptions, to see if we could in fact either substantuate (sic) or unsubstantuate (sic). Some we did and some we did not. I have to tell you, we did not substantuate the work factor.

Other issues that gave us pause -- and again, it's not a question that you can't come up with a solid upper bound model. I think, again, that was pretty clear that that was not only possible, had been accomplished. But what we really had problems with was the question of data. This was raised earlier, that there was a -- you know, unlike some sites -- we went through Bethlehem Steel. This site we know there was a spectrum of records that were available in 1974 that apparently, you know, at that point had been either burned -- in some cases, if they were operational data, which is I think standard procedure -- but most of them were boxed up and actually shipped to Pantex. Okay? That much we know. And in that -- in

that shipment were some very important health and safety procedures, there were swipe sample data, we think bioassay data, what have you. And clearly that data was not in fact used. Right. In the course of this review we just conducted we got some information from a worker that actual neutron dose rates and neutron to photon -- I'm sorry, neutron dose rates and neutron spectral data had been collected back in the early '70's from the production line at Iowa by Battelle, the national lab, and that data in fact was reported back and was available. And this is written up in our report, but I guess we had two reactions to that revelation. This came from the workers themselves. One, it sort of gave us a question regarding how complete the document review was, because clearly this had not been picked up. And second, this has tremendous implications to this point of conducting a realistic estimate of neutron dose at Iowa.

A good reason why we're going to the model, the neutron/photon dose rate model, is because there certainly isn't a lot of confidence in the NTA-based neutron dose information at Iowa.

But here's a case where the actual measurements have been taken, report isn't available yet, but clearly there's implication that maybe a modeling isn't necessary. In fact, we actually have fairly decent information that would be available.

In general I think there's a number of issues, and I guess the Chairman's beginning to signal me that haven't been covered very well, but I think our conclusion is that there's a large field of information that hasn't been accessed, that still needs to be looked at, both classified, unclassified. There's neutron dose rate measurements that needs to be reviewed, included, made available. And certainly I think the work factor represents a -- a significant shortcoming, a gap in what otherwise is a -- you know, a fairly complete model, at least on the external side. And without that gap being filled and frankly addressed by comparing it to the worker experience, I think it's a -- it's a -- it's a substantial problem.

Is there any questions from the --

DR. WADE: No.

BOARD DISCUSSION: IAAP TBD

DR. ZIEMER: We are running very tight on time, but maybe we have time for a few questions, then we're going to take our break. We have a public comment period starting at 4:15. We want to have a break before that, so -- and we of course will be returning to this topic -- we have a full morning of discussion ahead of us, but a few questions right now perhaps, either for John or for Joe --

MR. GRIFFON: This is probably for John --

MR. FITZGERALD: Arjun, as well.

DR. ZIEMER: Mark?

MR. GRIFFON: Yeah, this is probably for John. In the -- I'm noting on your -- your -- I think it's two overheads before this or -- I'm not sure where it is -- that one, that one right there -- 1965 total monitored people is 35. I know this is details, but I think there's important details here. In the pie chart that NIOSH presented, there's 40. Can someone explain to me what the difference is? And it says 40 workers from a single dosimeter cycle in '65, so...

MR. TAULBEE: That's correct, the -- this is

Tim Taulbee with NIOSH. The data that John has presented there in the total monitored came from summary sheets that were filled out by the site from their -- these were things that they had to report to the AEC. The data that I used is the actual dosimetry reports. They monitored more people than what is indicated there in that particular table.

MR. GRIFFON: And is the -- the data that you used, Tim, is it consistent with the spreadsheet that you provided to me?

MR. TAULBEE: That's correct.

MR. GRIFFON: All right, 'cause I tallied up 31, but we can -- I can talk about that later. I'm assuming thi-- is this 40 all the people that were monitored or greater than zero?

MR. TAULBEE: For like 1965 that was from one dosimeter cycle, there were 40 names on that particular cycle.

MR. GRIFFON: Forty names, so it could include the zero data. Okay.

MR. TAULBEE: Yes.

MR. GRIFFON: I stand corrected. Okay.

DR. MELIUS: Yeah, that was my question. I think it does include the zero. I was trying

to get at with the other.

DR. ZIEMER: Thank you. Richard?

MR. ESPINOSA: My question goes to both NIOSH as well as SC&A.

DR. ZIEMER: You need to get closer to the mike there.

MR. ESPINOSA: On the findings on number eight, all potential relevant records, classified and unclassified, hasn't been reviewed, and it kind of goes to your document, the April 22nd, 2005, page 12 of 20, the third paragraph, were generated during the operation of IAAP and were transferred to Pantex in 1974. A number of these were identified, requested -- were not identified, requested or reviewed. I'm just kind of wondering what percentage was reviewed or what's missing, was a percentage omission and if there's anything at Pantex still that's been identified today that hasn't been reviewed -- as far as the mis-boxed at Pantex.

MR. FITZGERALD: Well, I think that was a question that -- I think it was Tim that had answered that before, and we had a lot of discussions about to what extent the Pantex database had been accessed and actually walked

through and catalogued and inventoried in terms of what was there and to what extent it was relevant to the overall review. My concern there is -- and we put this in the report -- that we understand that boxes were mislabeled, some of the records are mis-boxed at Pantex so that the -- that the categories and the information that perhaps NIOSH might be using as a guide may not actually jibe with what the records actually are. Some of the missing records which are essential to coming up with a conclusion on a number of these issues, such as bioassay data, which would give us a handle on internal; some of this swipe information that isn't available which is essential to, you know, confirming this notion of no internal dose; and certainly some of the other issues we feel might very well be in a lot of those records and -- just beyond us how that has not been inventoried and we do not have a good feel of what some of those records are. Now some of them are clearly operational records and probably will turn out not to be particularly useful, relevant, whatever. But certainly some of these other records in terms of the safety

information, terms of the radiological information, we think will be very essential and there's just no clear idea of what's there. I think it's a -- it's a plane ticket to Amarillo, it's a walk-through for a couple of days and you -- and you're going to have a pretty good handle on what you're dealing with, but it has to be done.

DR. ZIEMER: Thank you. Does that answer your question, Rich?

MR. ESPINOSA: Yes.

DR. ZIEMER: I think Mark has another one here. Oh, Jim, yes. Go ahead.

DR. MELIUS: Well, my -- actually this will be brief and it refers to this slide that's up on the -- up there now. Your finding number four in your report basically says -- talks about the statistical significance or representativeness of the data that's presented up here, and you use 196-- for 1963 to '67. I'm just curious why and what basis '67 is the cutoff. I mean I can see from here, but is there some other analysis that would say that, you know, that that is -- data got -- suddenly got so much better or so much more

representative in -- in -- starting in '68?

MR. FITZGERALD: No, and I think NIOSH would need to answer this more, but I think we were looking at the numbers of workers, and it's pretty clear the badges began to rise and that -- that was certainly obvious. But the numbers of workers, in terms of the workers involved, that number didn't appreciably change much at all for the few years beyond that point. And in looking at the records and interviewing the workers, it just wasn't clear to us what the break point was at that point. The -- certainly the TBD speaks to continuous monitoring, but I think what we could glean from the data is that the continuous monitoring was the -- in fact those workers being monitored more often and the badges being presented more often, didn't represent a wholesale expansion of monitored workers. So -- you know, and there's just not an elbow on this thing. It certainly was a gradual rise, but we didn't see substantial difference in era three.

Now that's strictly going by the data, and I think the data's all you have at this point.

DR. MAKHIJANI: (Off microphone) (Unintelligible) answer a little bit. I'm Arjun Makhijani. These -- the break point in '67 is actually more -- more significant if you remember that the statistical analysis of uncertainties really has to be done by job category. So you cannot -- the -- NIOSH's charts in Appendix F where they plot all the non-zero data get at part of the problem by omitting the zeroes and not wearing the badges, only a part of that, but really in order to go from here to the individual worker, you do have to know which of these badges are representative of that work type. This is very transparent in the Mallinckrodt thing -- site profile which we're going to discuss later on, but there's no comparable data here. There's a little bit presented by Dr. Taulbee in his presentation, but it's evident that there are a number of categories and if you -- if these include zero data, you only got a couple of dozen total non-zero film badges, if that in some of these years. In some it may be a few. And by the time you get down to individual work categories, you may not have very much for a

statistical analysis. So '67 is not a bad breaking point, although we don't know how many zeroes we have there.

DR. ZIEMER: Thank you. Mark Griffon.

MR. GRIFFON: Yeah, I -- I just wanted to -- and I'm -- I'm going to ask Tim this question, probably. I wanted to know what you might be able to say -- 'cause I was going to offer something, but I don't want to put my foot in it -- on the -- on the era dose, 'cause I think that's an important factor in calculating the work factor, the denominator. Can you say anything more about it that might describe -- well, I'm going to -- I'll leave it at that. Can you say anything more to shed some light on what that value is?

MR. TAULBEE: Unfortunately, no, we can't. But you know, as we did discuss in Germantown, there are some -- some reasons and some things that are going on with that era dose rate.

MR. GRIFFON: Okay. All right.

DR. ZIEMER: Roy DeHart.

DR. DEHART: Both groups referred to classified data and were unable to explain properly in answering some questions. My question is, if a

dose reconstruction was done, I happen to be the claimant, could I do a reconstruction without access to classified data?

DR. ZIEMER: Tim, can you --

MR. TAULBEE: Yes.

DR. ZIEMER: -- respond?

MR. TAULBEE: All of the data of what we use to do the dose reconstruction would be in the Technical Basis Document. How we developed the work factor is unfortunately not fully detailed in the site profile or in the Technical Basis Document. But all the numbers, everything that would be crunched, everything that would be used to develop the dose reconstruction is in the Technical Basis Document. It's the how we got to some of those numbers that's not.

MR. FITZGERALD: Was your question whether you could do the dose reconstruction with the actual data, not the model?

DR. DEHART: Correct.

MR. FITZGERALD: Yeah, that's what -- I thought so, and I guess, Tim, if you did not use the model, could you in fact use the -- or actual exposure data to do a dose reconstruction or would you have to bump into classified

information?

MR. TAULBEE: If we were to do a -- basically if you were to discard the generic pit, the access of the data that we have to go back to the actual source term materials and reconstruct the doses, we do have access to that. But all you would end up with is an annual dose and therefore there would be -- we wouldn't be able to describe to you at all how we got to that dose. Does that answer your question?

DR. DEHART: Yes, it does. Thank you.

DR. ZIEMER: Mark, did you have an additional question?

MR. GRIFFON: You know, just to follow up on that same line of questioning, is there any -- and I -- this came up on our conference call. Is there any reason -- I guess other than overestimation techniques -- any reason for this drop-off in '62 to '63 dose estimates?

MR. TAULBEE: The only reason there is the change between using a source model -- source term type of model in which we compound the uncertainty and compound claimant-favorable assumptions versus when we actually had routine

monitoring data with no data gaps.

DR. MAKHIJANI: Could I -- could I say something --

DR. ZIEMER: Yes, please.

DR. MAKHIJANI: -- about the no data gaps, Dr. Ziemer? One of the concerns that we had that is listed in Attachment 6, both in item one and item 23, is that there are actually data -- there are probably some data gaps in the non-zero doses in the film badge dose records from '63 onwards because workers have testified that they didn't always wear their film badges. And that would likely also apply to at least some of the non-zero film badges. So there are missed doses in the non-zero film badges that are not accounted for in NIOSH's model post-'63 and pre-'63 'cause it enters into the work factor. So we've got a very significant issue because there's no real way to do a claimant-favorable analysis with -- with all the data that we have because we're missing a piece of the data and we don't know for how much proportion of the time each class of workers was not wearing their badges. That's a very, very significant data gap that needs to be

filled, and we do not know whether the data is out there to fill it, whether the information can be recovered from workers or otherwise.

DR. ZIEMER: Thank you. We're going to take a recess for 15 minutes, after which we will begin our public comment period. We -- the Board will return to the broad discussions of issues of the Iowa Ammunition Plant Technical Basis Document and our related reports again tomorrow morning, as well. So let's take a recess. Please come back promptly at 4:15.

(Whereupon, a recess was taken from 4:00 p.m. to 4:20 p.m.)

PUBLIC COMMENT

DR. ZIEMER: Let us reassemble and we will begin our public comment session.

(Pause)

The Board would like to particularly focus this afternoon on commenters from IAAP, and so we're going to give those commenters preference in the comment period in terms of the sequence of comments. If in -- if, before we run out of time, we run out of IAAP commenters, we will then open it up to commenters from other facilities. But for example, there will be an

opportunity tomorrow, particularly, for Mallinckrodt individuals -- although we're not going to exclude them necessarily today, but we want to focus and give priority to the Iowa commenters first. So -- and I do have separate lists here, so I'm going to begin with my Iowa list and I'll just take them in the order that they signed up.

First we have James Shelton. James, if you would approach the mike there in the middle. And if I don't pronounce someone's name correctly, please give us the correct pronunciation. Thank you. That mike may need to be turned on. We're not hearing you.

(Pause)

There may be -- make -- there's a power switch -- here we go, is it going?

MR. SHELTON: Can you hear me now?

DR. ZIEMER: Yes, there you go. Good. Thank you.

MR. SHELTON: Okay, very good. My name is Jim Shelton and I worked at the Army Ammunition Plant from the first working day of 1953 to July of 1992. And during that time I was part of the AEC operations from 1956 to 1975 --

excuse me, I have emphysema -- which involved a production operator and supervisor on Line 1, and I worked in all areas. And also as a security guard and security supervisor, and was in these areas sometimes for eight hours a day. And I received a questionnaire for site expert interviews. I'm not an expert. I just worked there. And here's one of the most important answers I feel is of concern.

During the time -- during the times that I and others were assigned to areas that work was performed assembling or disassembling the weapons, this would be for the duration of the 8-hour shift each day. Work was performed on or within one meter of the pit, uranium, plutonium, radioactive material, and this was during the major part of the shift.

I was never issued or a film badge, a ring, wrist or dose meter or a pocket ionization chamber at any time. I don't even know what a dose meter looks like. And I never participated in any time-keeping where safety department kept track of time that I or others spent in a area recording the time and the dose rates, never told or shown what level of

radiation exposure that I received. Never had a chance to review my radiation history. I was not aware of radiation protection outside of the radiation monitors which went off every so often and we had to get out of the building. And safety would say -- come down, check it and we would go back in.

And best of my knowledge, urine and blood samples were never taken until after the 1970's, and these were samples that were taken during our annual physicals. The urine samples were for drug tests to see if we'd taken any drugs or not, and the blood samples were for our cholesterol and our good well-being, et cetera, not for radiation.

I never had a whole body count or a lung count to detect the amount of radiation dosage. I never used any type of instrument to detect radiation before leaving the plant at any time during the shift. As far as I know, no one else did, either, when they left.

Production people -- personnel were never allowed to eat in the buildings containing explosive, hazardous materials or in areas containing radioactive material. Smoking was

permitted in designated areas only. Security guards assigned to areas where the buddy system was in place. This is where two guards have to be together. They carry two keys. One carried a key -- one carried a key and they locked themselves in the areas and they were allowed to eat their lunch in the buildings that contained radioactive material as they were not allowed to leave their tour until relieved by the oncoming shift guards for the oncoming production shift. They were within one meter of the radioactive material quite often each day, each shift. Also the guards wore their uniforms home each day. We never had lockers or showers until the late '70's. That's when we got a new building.

Mrs. DeMers had called me a couple of weeks ago and she was asking me about the amount of time that personnel spent working on this material, and she said that NIOSH was under the impression that personnel worked one hour a day, which would amounted to 365 hours in a year. This is not true, and somebody led them on somewhere. Okay -- okay, I'm not sure where they got their information from. We normally

worked on or within one meter of the radioactive material most of the 8-hour shift, including ten-minute breaks and a 30-minute lunch break. And when a push was on, we could work ten to 12 hours a day, seven days a week, and we could be on this for seven -- for several months at a time.

And the guard department -- get back to the guard department -- they was never issued any other special type of equipment that when they went into these areas, and they was in these areas for 8-hour period of a time and the buddy system, each one checked on the other one, checked all the material that was in there to be sure there was no tampering. And this was checked every few minutes. And this also included the yard C -- C, where the material was located, where they stored it. And guards was I believe more acceptive (sic) to this material than anybody else. Thank you for listening to me.

DR. ZIEMER: Okay. Thank you for your comments.

Next we'll hear from Laurence Fuortes. Dr. Fuortes?

DR. FUORTES: Thank you. I just want to make some comments regarding Mr. Taul-- Dr. Taulbee's presentation. First I'd like to kind of apologize to Larry and the NIOSH people for getting emotional during that presentation, but I think that's evidence that we all take our work rather seriously and the products rather seriously, and we have to take ownership for -- for those things we -- we produce.

Tim made some statements that I really had to react to -- maybe not as emotionally as I did, but some of those statements were things like I'm confident that these were the workers who were most highly exposed. I don't know, I -- I come from this from a very different standpoint. I had a -- I had a meeting of -- excuse me, a conference call between my staff and Larry's staff a week or so ago and we tried to go over these same sorts of assumptions that we make and where we're coming from. Coming from the same problem from a different set of assumptions, obviously.

But my set of assumptions is that we don't know. I mean I try to teach my students when I teach science that ignorance is the first step

towards enlightenment, and you don't come to the process of discovery of truth from a set of assumptions. We talked about this grand illusion when we talked about the optical illusion of the arch. It's still the same issue.

I don't understand how a scientist could look at this and say I know that these are the most highly exposed workers when they're told there were quite a few workers who were not exposed -- or excuse me, were not badged. And we have histories from workers that what, 140 workers were working in the bays themselves, but we have in these years only 15 on the pie chart you showed, 15 workers labeled as production workers and we don't know where they worked. We just know they were production workers, and of the 800 or so production workers at a period of time, that's what the major title was in the bays. So 15 out of 140 people who worked in the bays badged.

The guards who were working in the Y yards with the highest area exposures never badged. The workers who were doing disassembly, by their own history, never badged. The workers who

were receiving the pits from the igloos, shipping them back and forth, never badged to our knowledge. So I'd say there is a certain degree of uncertainty in my reading of workers' histories, which I don't recognize in the Rev. 0 or Rev. 1. I certainly don't recognize it in the statements made by the scientists who say I'm confident that this is the highest exposed work force.

Just a moment ago Dr. Taulbee said the reason that we have a different criteria post-'62 than pre-'62 is because this is the period in which we have no data gaps. I don't come from this situation of worker histories and observation of the badge data with that same assumption. That's -- that's an a priori assumption made by the scientists that will certainly affect their interpretations of the data they see.

Another observation is the confidence with use of surrogate data. At a certain point I was -- smoke was coming out of my ears, I'm told, when one of you asked about the confidence of use of Pantex data for radon exposures. And the explanation was well, the Pantex data is more claimant-friendly. It's more claimant-friendly

because the Iowa data was much lower. Whereas we had discussed the fact that the Iowa data is not only from 30 years later, but it's from a totally different work setting. It's from above-ground wooden barracks. That's -- those are ambient levels from Iowa whereas as the SC&A folks told us, you know, John Mauro said you could have ten-fold -- you could have hundreds of picocuries in underground areas and in -- in these high -- high geologic strata for radon.

So actually those are the only observations I wanted to try to point out to you, that there have been some -- some statements made as if they are fact, very strongly, which I would have to try to -- to introduce some element of doubt in -- in your minds. Thank you.

DR. ZIEMER: Okay. Thank you for those comments, and next --

DR. WADE: He has another comment.

DR. ZIEMER: Oh, I'm sorry. Yes, continue.

DR. FUORTES: I was told I was supposed to get up here and make one statement and I made three unrelated statements -- had to do with the chart, I'm sorry, that -- that was shown and --

and the job titles. I'm trying to work through this with the SC&A consultants. The job titles that we have for this facility are only based on termination records, and they are not exclusive job titles. So when you see that pie chart, please understand that people could have had multiple job titles. Radiation technicians typically have only one job title and task. However, all of the other job titles we are truly unable to attribute exposures to the job titles. It's a very complicated problem based on our -- our lack of -- our lack of those sorts of personnel data and IH data, sorry.

DR. ZIEMER: Yeah, I think we all understand that. In fact, a good point because probably none of us here have had the same job title all of our life, you know. We -- we do change.

MR. GRIFFON: Can I just ask one --

DR. ZIEMER: A comment here from our --

MR. GRIFFON: -- follow-up --

DR. ZIEMER: -- or a question here for --

MR. GRIFFON: Lars (sic), one -- one follow-up question, if I could, on that. The pie chart was presented as a -- as departments. Is that what the data was? Was it job title

information or department information?

DR. FUORTES: They are actually job titles at termination. We don't have department data. The only department data we have are area data from the storage yards. Otherwise we have individual badge numbers.

MR. GRIFFON: Okay. So I'm -- I'm confused. I might need a clarification, not now, but --

DR. FUORTES: Well, there may be difference in perspective how to look at these data, but the data that we have were the Landauer badge data, and we matched those codes to individual pers-- personal identifiers and those to the job codes at termination.

DR. ZIEMER: Okay, thank you. E.D. Webb.

MR. WEBB: I'm going to try and explain a few things to you people. Before I start, I want to tell you, you have my condolences. They expect you to make an honest decision that affects a lot of people, out of a bunch of hearsay. They don't give you the facts. They haven't give you the chance to get the facts. I heard a man stand there and talk about dummy pits a while ago. He never saw a unit. He never saw a unit in construction. They never

saw a standard operating procedure outline for how to build these units. I worked 25 years at that installation and I get a little bit perturbed at some of the information that's been thrown at you people.

They claim -- engineering claims we couldn't get too close to an item that could possibly be putting out radiation. They don't know what they're talking about. When that pit is brought into production, it's brought into production. When it's immersed in cast explosives that had been properly machined, that's a stage of construction. The further that item goes, the more sophisticated it becomes and the more critical becomes the inspection of the construction stages. Those stages are inspected by two people, production inspection and AEC inspectors.

Another thing they have told you that we could not be exposed for over one hour. One item would make that a lie if they knew what they were talking about, the assembly of a Mark-34. That has to be dry run. It has to be shimmed to make sure that you've got the proper glue gaps. Then it has to be disassembled, every

piece -- including the shims -- laid in progression on a mortician's cart so that they go back in the order they were taken off, and it's -- after it's assembled around the center piece, then you go around there with a rubber glove and you feel for a step. This thing's put together in a cage. There are long brass rods about an inch and 3/8ths in diameter with tension clamps to hold that HE in close to that center piece and to put them in there at different degrees of tension so that you have no step. When the glue gaps are cleaned off, they get gone over with an eyepiece with a micrometric reading in the bottom of it and -- and it's got to be in spec or it's no good. The people that are talking about these dummy pits, I would suggest to get ahold of an SOP, probably from -- from Amarillo, and go through it and get some facts. I wish there was some way you people could have stopped at Fort Madison or Burlington and talked to more of the veteran people that worked there. There's a lot of them couldn't come up here because they're physically unable. And because of the expense of their ailments, they can't afford

the cost of coming up here, and you're hurting yourselves if you don't give them every opportunity to tell you what went on.

But don't listen to these people that's getting this out of the air. That's a pipe dream. Anybody sitting here that worked in Division D can tell you after listening to that man, he never saw a unit constructed. I doubt that he ever saw a unit completed. And thank you for your time.

DR. ZIEMER: And thank you, Mr. Webb, for those comments.

Next we'll hear from Jane Stronger.

MS. STONGER: That's Stonger.

DR. ZIEMER: I'm sorry, did we -- is that wrong?

MS. STONGER: It's stronger without the first R, Stonger.

DR. ZIEMER: Okay. Yes, I see that now.

MS. STONGER: I'm different from a few of these people because I wasn't working there back in the '60's. But I'm the youngest of ten kids with a father that worked there and died. Many of my friends has parents that has cancer or died of cancer, and one question for NIOSH,

back in March of 2004 they sent us a letter stating that they was ready for the dose reconstruction. They had all the information, they was ready for a go. Then in January of '05 they sent us another letter stating that oh, we don't have enough information after reviewing your file. So... thank you...

DR. ZIEMER: Thank you, Jane, for your comments and -- there are NIOSH people here today if there are additional questions on that case that perhaps can help.

Debbie Detherage? Debbie?

UNIDENTIFIED: (Off microphone) That's my -- one of my sisters.

DR. ZIEMER: Okay, thank you. Anita Loving?

MS. LOVING: First off I want to say that I'm not a public speaker, so I apologize. I'm not used to this. But my father and my mother both were employees of Iowa Army Ammunition Plant, my mother from 1952/1953 until two months till -- before I was born in 1959. My father worked from 1958 until they closed the line in 1974. However, after talking to one of his coworkers' wives, I discovered that he actually started in 1949.

But what I wanted to draw attention to, I don't know how many of you saw, but there was an article in yesterday's *Des Moines Register* in the opinion section, and that all started from an e-mail I received from Paula Graham telling me of your telephone conversa-- or telephone conference that was to be held. She -- she e-mailed me -- it was April 10th, and I wrote back a response to Paula that said (reading) Hello, Paula, thank you for your e-mail. I want to help with this fight all that I can. My father, Wendell D. Pirtle, passed away last Sunday night, April 3rd. Monday, March 23rd -- or March 28th, excuse me, we were told that his cancer had come back and there was a large mass in his pelvis area and it had spread to his lung. He didn't even last a week. I had prayed so much that this compensation would go through in time that he could get to see some good from it. I am so extremely angry right now that I want to put that anger into some good use and get these people to wake up and realize how many lives have been ruined by their exposures. I have to go back to work tomorrow after being off a week for my dad's

funeral and preparations. I don't know how much of the phone conference I can listen to, but you can bet your boots I will go to the Cedar Rapids meeting.

And then the e-mail continued on with a few personal things (unintelligible), but this past Monday night I received a phone call when I got home from an Andy Dominick who is a reporter for the *Des Moines Register*, and we e-mailed and talked on the phone several times during the week, but she asked me to write a letter of the things -- what I would like to tell the Board, and that appeared in yesterday's paper. There's a copy up there to see and I would be more than happy to bring photocopies tomorrow for anyone that wants to see it. But this is what the -- what the letter said.

(Reading) Members of the Board, I was asked what message I would like to convey to you, and the first thing that comes to my mind is the sacrifice of health and life by hundreds of unsuspecting workers at IAAP. They were serving their government and country, all the time trusting their government and country to keep them safe during their employment. They

were deceived. While they did make an adequate wage, by no way -- by no means did they receive the amount of compensation it would take for a person to knowingly destroy their health, day in and day out.

My father was a very proud American, and he served his country well both in the Air Force during World War II and then at IAAP. I feel the government has done him and all the other former workers a great injustice. I am so angered by the time and the money spent on trying to recreate radiation exposure, a task probably impossible. You are spending millions of dollars when that money could be spent paying the claims to those who truly deserve the compensation.

My father will not ever get to see the compensation he deserved because he died last week from cancer, cancer caused by exposure to hazardous materials during his career at IAAP. His illness dramatically affected his quality and length of his life. After having surgery for colon cancer, he never again felt comfortable going out in public. He withdrew from society. Due to lung problems he was no

longer able to take his one-mile daily walks. I beg you all to consider granting this Special Exposure exemption Cohort to all the former workers with the 22 cancers, and to do so before it is too late for the remaining ones to see the benefit of it, as is the case for my dad. Before my father died he made me promise I would not give up the fight for the compensation he felt he was entitled to. I of course do not feel that the $150,000 compensation in any way whatsoever compensates for the loss of my father's health and certainly not his life.

When I think of the average compensation 9/11 victims received, settlements in the millions for their casualties, it really angers me and saddens me. These 9/11 victims, while -- while these 9/11 individuals, while were victims also, were not blatantly neglected and deceived by their own employer, United States government.

Some have said that dose reconstruction can be done using the records obtained from Pantex. I know my dad always told me that there was no comparison between Pantex and IAAP. Pantex

housekeeping on how the materials were handled was far superior to IAAP methods. It's not comparing apples to apples.

As for records of national security, if they're being based on tests of classified documents, I darned well want to be able to go over and have copies of this information. They cannot use evidence without making it public to families and the workers involved.

Please stop the deception and do what is right. Respectfully submitted, Anita A. Pirtle Loving, daughter of Wendell D. and Mary Frances Pirtle, both former employees of Line 1, IAAP, and both died from one of the 22 cancers.

Then I have just a few questions that I wanted to point out. First off, you know, all the research numbers and all are really impressive, but it comes down to this. You're dealing with human lives and the families involved, not the numbers.

And second off, members of the Board and NIOSH, I ask you to stand and look me in the eye, and all the other workers, and tell me that you would do any one of those jobs on the line of IAAP for as long as those workers did, and you

could honestly tell me that you would do it and -- and accept the radiation exposure that they did, tell me honestly that you would do it.

And number three, there was an article in the paper here back in November in the *Hawkeye* that said since the law was enacted in October, 2003, the Energy Department has expended $95 million on administrative costs, but has rendered determinations by physicians panels on fewer than eight percent of its claims by October, 2004, and has only secured payments for a mere 31 workers as of August, 2004. Now just looking at this today, I can see where a lot of that money's going, and it's not going to the ones that deserve it.

Then I wanted to ask how the Special exemption -- or Special Exposure Cohort would affect my mother's employment, because the way I read it, it was to anybody after 1962, while my mother worked from 1952 or early '53 until 1959. And to file a claim I had a heck of a time getting records. They had no proof she ever worked for them. She was on the government side and I finally tracked down a coworker and friend of hers in Davenport who had to fill out a special

form stating that my mother did work with her. Second of all, they keep as-- they keep saying that there's no physical evidence of the -- of the radioactive fissile material before 1955. I want to reference a letter that a coworker of my father received from -- his name was James (unintelligible) and the letter was dated December 28th, 1962, and there were nine -- nine individuals that trans-- that tran-- that traveled to -- it says here (reading) Work involved necessary training at Sandia Corporation to become proficient in assembling and testing of material produced by the contractor for the United States Atomic Energy Commission. Those were nine inspectors and my dad was one of those and her husband -- her late husband was also one of those, and they -- they -- they trained in September of 1949 on how to assemble and disassemble and the testing, and then they came back and started at IAAP. So that was in 1949, so I don't know why they would have been trained and -- and -- to be proficient in this in 1949 when it didn't -- if they say it didn't start till 1955. That doesn't add up to me at all.

I guess the biggest thing I want to say is that you really need to think about who it's affecting and not the numbers. I mean it's -- it's affected a lot of lives. I'm an only child and I was extremely close to my parents, and my mom's been gone ten and a half years and my dad three weeks. And as far as the dose reconstruction goes, I don't buy this and I'm not okay with this, and when I told my last I love you to my dad that night and he kept telling me don't give up on the fight, that's what I'm doing.

DR. ZIEMER: Anita, thank you for your remarks at a very difficult time in your life, I'm sure.

Incidentally, there's a -- Board members, there's a copy of the newspaper that Anita referred to here on this table, so if you want to peruse it after the session here, you can do that. I think Anita wants to take it back with her, but you can have a chance to take a look at it.

Next we have Gary Greene -- Gary?

MR. GREENE: Just an initial comment -- for someone that didn't -- doesn't do a very good

job of public speaking, I thought she did a nice job explaining that.

I'm here also on behalf of my parents. My mother and father both started working at the ordnance plant in World -- during World War II in the early 1940's. They subsequently met, married, and I guess I'm the result of that marriage. In 1951 my mother went to Line 1 till 1954, and at that particular point in time, within two years -- I guess it was three years, 1957, she contracted -- of cancer, rapidly-growing brain cancer, operated, removed an extremely large tumor out of her right brain and she died in 1961. I was 13 years old.

So during that time period, as I was growing up during that period, when both my parents would come home -- I don't remember much out of those first 13 years. I do remember one comment that was made one time -- because all of this was classified at that particular time, extremely top secret. My father ended up staying at the ordnance plant till 1974, didn't talk about those days at all. But I do remember one comment they made, the two ladies that worked on Line 1, was boy, our watches are really

going to glow tonight. I never really understood what that meant until about four years ago in 2001 when this started.

So during that time period then there's some things that have happened since 2001 and I guess today when our two senators were here -- or at least their comments were here, if nothing else, and I unfortunately couldn't be here, it's -- it's odd that we have two senators from the opposite side of the aisle in Washington, D.C. coming up with the same scenario of really pushing this Board into taking a look at quick action, early action, and what you're going to take a look at tomorrow is the petition, to take a look at all of these workers that are here today. Some of them are still with us, and thank God they are. Some we lost just three weeks ago. My parents have been gone -- my mother's been gone 45 years, my father's been gone since I was 33. He died in 1981.

Now this is hard for all the people sitting here, and I understand the scientists' point of view. My background is science. I'm -- was a high school chemistry and biology teacher, so I

kind of understand where these things are going. However, now in private business I'm doing some other things, and when we go to a state university, for example, to get information leading towards research, we -- we always go in for unbiased opinions when we do that, and that's how we present that to companies that we work for. But you know we pay those people to do the work. Do you suppose they would give you other -- results other than what they're looking for? Please bear that in mind, and I hope that our government's not doing that. I do not like the term "cover-up," but I do know in the '50's and '60's this was high profile, top secret, very, very classified information. We were at war in the 1940's, the 1950's and early part of the 1960's. So I appreciate your time and I thank you.

DR. ZIEMER: Thank you. Thank you, Gary. I do not have any more names on the Iowa list, but I want to open the mikes if there are other comments from Iowa folks. Yes, please, sir.

MR. IVERSON: My name is Si Iverson. I worked at the -- on Line 1 from 1952 to 1954, came

back in 1957 and worked till 1975. You just heard what Ed Webb said about dry running the HE with the pits. This is true 'cause I did the same thing at one time.

Also I want to get into the idea of pits, also. I received them and -- in this one area and they were -- when I was there we had -- had two inspectors that done the job, but what I had to do, safety would come down every morning and -- and select ten pits and say open them. So I would open these ten pits, take the tops off of them, and they would swipe them, and then -- they was two to a cart. Okay? Then I'd take these two to the inspectors and they'd lift one of them into a scale and close a door -- it's a glass door. Okay. Then they'd take some kind of measurements and weighed them. I don't know what they did for sure 'cause I didn't care, but there was two of them and one guy was taking measurements. When they get done with it, then they put it back on the cart and start over again with the other pit and so the same thing. This is done day in and day out. And when they got done with those two pits, I wheeled another two in; and sometimes I would

cap them right away, sometimes I would not. When I got down to only about two pits left, I'd open ten more. That's what -- and day in and day out. And the radiation badges was behind me, way up behind me and I was down here handling the pits, all the time, day in and day out.

Lunch break, yeah. No other breaks because we couldn't go nowhere. Once in a while I may walk up to the (unintelligible) or something like that, but generally -- once in a while my foreman called me into another area. But this -- I've tried to be quiet, but I'm to the point where I think something should be done. I've seen too many people go for various reasons, and I try not to make this a personal issue. I firmly believe in this program and I firmly believe that it should be resolved. How? I hope in our favor. I've seen too many get up -- people get up here that are, you know, all broken up. I mean I never lost my parents because of this. My dad did work out there, but he was never -- well, he might have been 'cause he was on Line 1 rare occasions. But something's got to be done. We keep hearing

all the money that's being spent. I mean I just hope -- it's got to end. I mean these people are -- I've lost too many friends, too many people I went to church with, too many people that I sat down in the nearest bar and drank with, and all things like that. It's got to come to an end, folks. We've got to do something. There's nothing left to do. I mean that's about all I got to say, but doggone it, let's do something, and let's hope it's the right thing. I thank you very much.

DR. ZIEMER: Thank you. Yes, another hand here. Just a moment. Ms. -- oh, Ms. Graham? No.

MS. YERRINGTON: I'm Lasca Yerrington and I'm like Mr. Harkin this morning. Here's this chart about unmonitored workers, and it wasn't put in the new revised version of the site profile. We have both that were sent to us, and this was left out where they had like 1,030 not monitored and total monitored was 29, which meant that 97 percent were not monitored. And this is from 1962 through 1973, and the least percentage not monitored was 72 percent. And that is -- that is bad. And I couldn't

understand why this was left out of the new site profile.

And another thing, I want to say this to start with. Prior to the onset of the IAAP in 1941, this area did not have or use the household and farm chemicals that we use today. On farms we used manure and lime. Our housecleaning supplies were soap, soda, vinegar and good old muscle power. So where were these workers exposed to the radioactive materials, explosives, solvents, other chemicals and metals? It evidently was during their work days at the IAAP. We never heard of cancer prior to IAAP except one woman in the last few weeks before she died, and she lived on the highway -- close to the highway -- they diverted traffic several blocks away so she would not be disturbed. This diversion of traffic was done by the Iowa Highway Commission because it was so rare, cancer was so rare. That's how rare it was for us to have cancer around.

Another thing I'd like to say, my sister and I -- Paula -- we received the report from ATSDR, and we found some incorrect information in

that, because we had seen at one of our meetings with the DOE and the DOD -- 'cause we're on the DOD advisory board -- we had seen a slide that showed machinists working in their -- their clothing. And in the ATSDR it said nobody worked in their clothing. So we had them -- from the Iowa City -- we tried to send it, or Paula did, through her computer which she couldn't get it to go right so she called up to Iowa City, and I don't know whether it was Howard or -- I think it was Howard sent it down to them. So we talked to them and asked them if they would change this in the ATSDR. And Catherine Hanks said no, that she would put it in a file drawer and if anyone ever asked about it, she would dig it up. And my sister said to her, you could print a paper correcting this and could send it out to everyone that had the ATSDR report, and she said no, she couldn't do it.

But it showed them working not only in their street clothing, but it showed them work-- with their lunch boxes open, their thermos bottle's there, and they were probably machining beryllium alloy.

The last thing I want to bring up is this. I received a letter from NIOSH April 20th concerning individual dose reconstruction, and to be at the Crowne Plaza Five Seasons Hotel. This was for my husband and mother, who both died of cancer. I want to read that paragraph to you. It says (reading) On Sunday, April 24th, 2005, NIOSH will be at the hotel mentioned above to discuss individual dose reconstruction status information between 3:00 o'clock and 7:00 o'clock p.m. If you have questions about the status of your claim and are unable to attend on Sunday, NIOSH will also be available during the Board meeting. Appointments are accepted but not required. I came here believing NIOSH had some important information to give to me. I even thought they were going to say my husband's dose reconstruction was finished and they were getting ready to compensate people to show that dose reconstruction really worked. I really thought that since my sister and I were activists concerning the IAAP that they were going to pay the claims so that we would not be so vocal and go on being activists.

In talking with NIOSH -- with a NIOSH representative, we found out no more than we -- than we learned from the reports we received from -- every few -- every -- every quarter for the last two years. Nothing there changed. I understand that Denise Brock's mother was the first to be compensated at Mallinckrodt. Denise is a vocal advocate for the Mallinckrodt workers. We need a Special Exposure Cohort for all these people, like Anita Loving and the others that have spoken up. Ed Webb, he's on -- he's on oxygen so much of the time, and he came here and I -- as I was sitting here watching Ed Webb speak, I thought is he going to fall over for lack of oxygen, because I saw his body jerking back and forward that he's tried to breathe. We need something done.

I do want to thank you all for being here, and taking all this into consideration. Thank you very much.

DR. ZIEMER: Thank you. Are there any others from the Iowa group that wish to address the assembly? Yes, Paula?

MS. GRAHAM: I'll try and keep this brief 'cause I have a tendency to talk a lot. That's

because I was a teacher of eighth-graders, you have to talk a lot.

Anyway, I -- there's a lot I could talk about --

DR. ZIEMER: For the record, give us your name, then --

MS. GRAHAM: Paula Graham.

DR. ZIEMER: Paula Graham.

MS. GRAHAM: Yeah, Paula Graham. And my sister and I, Lasca, have been doing a lot of research in the basement of the Lee County Health Department in Fort Madison, Iowa. And we've been researching the work plan for supplemental remedial investigation for Line 1, including the historical site assessment for the Iowa Army Ammunition Plant at Middletown, Iowa. And those records are very dusty, and they say we're the only people been there ever to look at them. And we found some interesting things. One thing we found was that in the 1960's, so this reference says, there was an airplane crash and an atomic bomb dropped out of the -- involved in the crash, and it was brought to the Line 1 to be disassembled.

Well, I got on the phone and I called Dr.

Fuortes and I said Dr. Fuortes, did you ever hear about this? He said yes, a worker told him about it. But the story was -- the true story was that this plane was taking off and the atom bomb dropped out of the plane, skidded along the cement runway, was damaged. A fire occurred and they say the bomb was brought in all blackened to be disassembled. I'm surprised that this was never in the site profile. My question is, were they exposed to radiation? They had this damaged atomic bomb that was blackened, damaged, a fire that occurred. And then I wondered how many more were brought in there through the years. So that's just something that -- that -- that I wanted to point out here, and I have a few other things to point out, but I can't point out all the things that I've found, it'd take too long.

You want him to talk? It's okay.

DR. ZIEMER: No, you -- are you finished or --

MS. GRAHAM: No, I'm not.

DR. ZIEMER: No, you finish first and then we'll --

MS. GRAHAM: I want to talk a little --

UNIDENTIFIED: (Off microphone) (Unintelligible)

DR. ZIEMER: Well, you'll need to approach the mike, but let's let her finish and then you can address the question, yeah.

MS. GRAHAM: I want to talk about safety.

DR. ZIEMER: Yes.

MS. GRAHAM: And I did not work on the atomic energy line, but I was security cleared to go there and decided not to go. My sister did and of course you know she died in 1956 after working there. But I can really testify to -- to safety on the Army side. I worked there during the Korean War and the Viet Nam War, and so you know, same contractor, Mason Hanger, Silas Mason Company, ran both sides. Of course the AEC was involved in the -- in the atomic side. During a period of I think from about 1951 to in the '80's sometime, there were numerous people killed in explosions and injured in accidents. And I remember one story -- one situation, wasn't a story. I was working on Line 9 in about '67 or 8 and we had a big explosion of a building that wasn't right on Line 9, but I think it was a storage

building, and we had had -- we'd all had a potluck dinner 'cause the women about once a month would bring in dishes and here was this young safety man and he had a tour of duty in Viet Nam and survived that. And he just enjoyed that meal, I tell you, how young men in their latter twenties can eat a lot of food. He just kept going back and going back and I thought boy, he's really enjoying that meal. Well, then they left, several of them left to go down to the storage building and we went back to our work, and I was inspecting. The production supervisor came in, she said Pa-- he said Paula, did you hear that explosion? I said yeah, where was it? And he told me, he said they've sent for the -- for the plastic bags, body bags to pick up the pieces, and that safety man was killed, so even a safety man was killed in an accident.

And there were -- during the Viet -- the Korean War I carried powder out of a powder house -- they call them rest houses where the powder dries. And it was so hot inside that building, when I would go outside -- it was winter -- I would get a headache from the difference in the

temperature. And I told my mom and dad it wouldn't surprise me but what that powder house will blow. It did that next shift and killed a girl.

And there were accidents, a lot of accidents happened. But one big story during the Viet Nam War -- now to me, when you're having safety inspection, it's surprise inspection. The workers don't know about it. And so we were told one day that there was going to be an inspection, safety inspection. And all the bays in the buildings had load limits for how many people worked in the bay for safety's sake. You didn't want to lose too many people if there was a big explosion. And the bays a lot of times were overloaded with workers, more workers than were supposed to be in there. And so there was a phone outside in the ramps that joined buildings, and the phone rang and a production worker went out there and answered it, and he said they're coming down from another building -- whatever building it was. Well, he gave everybody -- if there were five extra people there, he gave them push brooms, sent them out on the ramps, be sweeping the

ramps when the inspectors came so the bays would not be overloaded. When -- when the inspectors moved on, you put down the brooms, you came back in. So that's some ideas of safety when you were there.

And they lacked a lot of the equipment -- the things that we needed, like -- we called them powder coats 'cause they were all made of cotton. I remember one winter they never had enough coats for us. I worked out on a loading ramp and I was inspector, and they gave me permission to wear my own coat, and whenever I had to touch anything I'd take it off and lay it down, and that was a cold operation.

One other thing here, in this -- this historical site assessment -- and by the way, this was done by TM and Associates for the U. S. Army Corps of Engineers, Omaha District. And this is 1972, and of course they moved out in 1974 or 5, and this is an interoffice memo, annual review of all radiation safety operating procedures administration building, and this is what it says. This memorandum was to J. E. Shannon from the Division Manager of Manufacturing B, request that a system

implemented to comply with the annual review requirements of (unintelligible) all these numbers, be followed, that this annual review should be followed. This system -- this requires that Manufacturing B engineering and safety jointly determine which procedures are to be considered radiation operating procedures. Why are they waiting so long to decide what is a radium operating procedure. And there were just other things, too. And then -- on the safety, then I'll sit down -- March, 1972, this was production survey, Mason and Hanger, Silas Mason Company and so forth, and under the heading of findings and recommendations, operating procedures pertaining to radiation safety are not reviewed annually. They're saying they were not reviewing these operating procedures pertaining to radiation safety annually, as they're supposed to.

The second -- the contractor does not have a formal procedure to assure through analyses adequate quality of bottled or line-supplied breathing air. And they went on to say -- I'm short of breath, too -- a formal procedure to

assure breathing air quality should be prepared and published. This procedure for air quality should also include an assurance that breathing air line couplings are not compatible with other gas line outlets throughout the whole plant. So there wouldn't be a mix-up and somebody would get gas.

All right, the third thing, automatic conductivity measurement and control systems have not been provided for all cooling towers to control loss of chromate with the subsequent to effluent watercourses with chromate ions. Of course that would go into the atmosphere, too.

Next, the medical department has not conducted biological calibration tests on the audiometer. Under headings and discussions, it says the contractor has no formal mechanism to assure annual review of the radiation safety procedures as required by Albuquerque Operations Office. A statement requiring annual review should be added to the component parts manual or similar document.

These are just a few of the things that we found -- there were many, many more -- that I

think -- I don't know if NIOSH has reviewed this, but it sure has a lot of pertinent information in it, and I would urge them to. And another place I would urge them to look is the Rock Island Arsenal at Rock Island, Illinois. They have an archive there, and they sent me things, you know, that I have sent on to other people.

And I want to thank you people for listening to us, and I guess what I want to say is, like these other people, that I urge you -- you passed a Spe-- you approved a Special Exposure Cohort on the 9th of February this year, and I urge you to stand by that. Enough time has went by, enough lives have been lost, people are suffering and dying, and I don't know, we could probably go on forever and maybe never come up with the ideal dose reconstruction that people seem to want, all but the workers and ones that are suffering. And I do thank everybody for all the hard work they have done. I just wish I had more time to present more of this information that I've found. Thank you.

DR. ZIEMER: Thank you, Paula, very much. Mr. Webb perhaps has a response or some comments on

the issue of the weapon accident that Paula referred to, I think.

MR. WEBB: She mentioned a unit come out of the bomb bay doors and skipped down the runway exposed to fire. That was a Mark-25. My buddy and I took that apart. There was no danger of radiation. It was a sealed pit. The tube was bent. It wasn't kinked or flattened. There were two of those units. The first one, the shift supervisor come to my buddy and I because we worked together in a lot of different stages of different units in a press operation, and he said if you guys'll take this apart for me, when you're done, you're done. So we decided we'd go down and do it. Then, he wasn't a too highly respected or thought-of supervisor. We did it. We finished it about 9:30, 20 minutes to 10:00, started out of the ramp. The inspectors had checked it. It was all right. We put it in the good case and ready to go again. We got to the ramp junction and there he sat. He said where are you guys going? We told him well, you said when we was done, we was done and we thought we'd slip over to the equipment room and see if we could con them out

of a cup of coffee. He said ain't no way you can leave the area. So what are you going to do? We went back to work.

Wasn't a week till the second one showed up. He didn't have any luck begging that time. He took a young fella by the name of Todd from West Point, Iowa, production foreman, down there with him at the start of the second shift and had a guard standing outside of the cell. The rest of us went home at midnight. He's still down there tinkering with it, but there were two, not one.

DR. ZIEMER: Thank you.

MR. WEBB: And they were Mark-25s.

DR. ZIEMER: Thank you.

MR. WEBB: (Off microphone) And (unintelligible) no radiation damage from the first one.

DR. ZIEMER: Very good. Appreciate that added information.

I have a couple more who have signed up to speak. Dan McKeel from Washington University. Dan --

DR. MCKEEL: (Off microphone) (Unintelligible)

DR. ZIEMER: You can defer till the session

tomorrow.
Richard Miller from GAP. Richard?
MR. MILLER: Thank you --
DR. ZIEMER: GAP being Government Accountability Project.
MR. MILLER: Which means I don't work for the government.
DR. ZIEMER: Oh.
MR. MILLER: Good day, my name is Richard Miller. I would like to offer briefly five points and set of questions.
One, Si Iverson's comment, to me, had some significance given the number of years that he worked at the Iowa Army Ammunition Plant because what he raised in terms of the discussion of taking say ten weapons at a time and working through them in a systematic fashion seems to cast some doubt on the .153 work factor that's been proffered. And again, because we don't have access on the outside to know exactly how they got at that .153, at least his statement -- and I would add that Mr. Iverson is not a claimant under this program. He stands in no particular personal way to benefit from that statement. He works on the

former worker medical screening program, I think -- is that right? -- and -- but he has no way, shape or form -- and I just think it's useful if some weight can be given to worker testimony from Mr. Webb or from Mr. Iverson on that. But I do think that's a very significant point about -- and again, it's a pre-'63 point, but it's a significant point.

I think the second thing that struck me of the statements today was Dr. Fuortes's statement that the job codes were from termination reports. Now it's not just all -- that we have lots of different jobs in our lives, but the assumption that was proffered by NIOSH, both in the SEC evaluation supplement as well as in the presentation today, is that there was a very high confidence level that they have a representative dataset for those years, by job. And if -- and one of the things that's interesting about and the Landauer badge reviews as it's been -- and I had the opportunity actually to go look at some of these binders at U. Iowa, was that people worked in multiple jobs, so that you -- your -- what you were terminated from isn't necessarily

all of what you did during the course of your employment. It is only a snapshot on that day. Thus the question arises, given the way in which the photon dose badges are used, particularly for the post-'63 period, they leverage a great deal of this site profile. They leverage the work factor and a year of dose calculations going backwards prior to '63, as well as serving as a geometric mean going forward and the basis upon which you then multiply for neutron and -- and -- and the subsequent correction factors -- or quality factors. What -- the question that comes to my mind, it's sort of like building a house, you know. If you -- if -- you've got a thin reed here and you're really not sure how flimsy or how sturdy that particular support is going to be for your argument, and here it seems that there's some substantial doubt cast on how robust that dataset is in the '60's upon which to base so many multiplying and -- multiplying factors in both directions, back and forward. And I -- I guess that if -- at this point, where do you -- where is the comfort level -- where is the -- where is the weight of evidence

that says that one has a high confidence level if it's all based on termination reports.

Now one of the things that was raised by the Sanford Cohen report was they asked a question to NIOSH in a list of -- I think it's an attachment to the -- to the letters that were submitted to the Board. They asked (unintelligible) how many records and can you get an inventory of what's down at Pantex. But what I've been struck by is another question, which is what was shipped from Iowa to Pantex in 1974 and is there an inventory of what was shipped, because that's the first question that has to be asked. Then the second question is what have they found now some 30 years later down at Pantex -- right, Bob? What is the ratio of this. And I'm going to get to -- to -- to an indicator in a second.

If -- if -- if -- even if they reviewed five or ten or 15 or 20 percent -- and not that I'm confusing quantity and quality here, but if you're only looking at a small percentage of what's there, and you don't even know if that percentage is representative of what was originally shipped or whether it's, as -- as

was indicated, potentially mis-boxed or lost, what was the universe that one was going to start with that you don't have today? In other words, could somebody please explain on the record sort of the math, what was inventoried and shipped that are health physics records or related production records that are necessary for this work to do dose reconstruction, and how many can be even identified in the inventory at Pantex today.

One of the reasons it's puzzling is that in reading through the site profile, there are only 15 incident reports that were spotted. And for those of us who've been around heavy industrial production operations, 15 incidents in a 25-year period is a pretty remarkable accomplishment. And I'm unpersuaded, again, that we've found the boxes of the incidents or we've found -- that there's something missing here. And it may not -- maybe it made it from Iowa to Pantex, but it sure hasn't made it into this analytical process.

The other thing that was interesting was that in the course of the Sanford Cohen report they had an attachment which indicated that lo and

behold, beyond the early NTA film measurements which were deemed generally unreliable for neutron, Battelle came in in the '70's and did some neutron monitoring. Well, where are the Battelle neutron monitoring results and are those classified, as well? There's an e-mail attachment to the back of the Sanford Cohen letter, and I for one would like to know will those neutron measurements ever be made public or are we simply going to get someone's recollection of what they were when they were taken some 30 years ago. But this is indicative that if Sanford Cohen just got in there and in four weeks started digging and found neutron dose badge data collected by a Battelle person -- and Battelle was brought in to work on this site profile -- it begs the question does the right hand know what the right (sic) hand's doing?

The other question that is sort of a policy question about this is the statute prescribes up front that -- in the purposes section of the Act, that the goal is to provide timely, uniform and adequate -- and I never know what the word "uniform" meant, you know. I just --

and when I -- I mean how many times have I read this law and I never figured out what uniform meant, and today it dawned on me. When we saw the representation in the chart that was presented by both Sanford Cohen -- that the '49 to '62 time period had roughly 25, 26 rem of exposure per year for external penetrating dose, but from '63 to '74 it was somewhere between one and a half to three rem, round numbers, and you saw a ten-fold reduction in dose between 62 and '63, but we also understand there was no change of work practices between '62 and '63, can one consider this to be uniform? Is this a uniform approach and is it going to provide a uniform result? Well, obviously not. Then the question is, at what point and where and how did the equities about how similar situated workers are treated under the Act are addressed through this document, that's -- beyond the provocative questions that were raised by Sanford Cohen about whether you're dealing with extra-scientific questions in terms of introducing uncertainty, which I think is a very provocative point, this also raises the

question does this meet the statutory test of uniformity.

The last question I would like to just put on the record and hopefully someone can answer this before this Board meeting is over, we see in the presentation that is going to be made tomorrow by Dr. (sic) Elliott on the Special Exposure Cohort, two slides dealing with the Justice Department Office of Legal Counsel proposing what would be a very interesting perspective that the Secretary of Health and Human Services cannot grant a Special Exposure Cohort predicated on information which is classified. And we've seen a change in policy at this meeting for the very first time. Transparency has always been held out as a hallmark of this program, but in Dr. (sic) Taulbee's presentation today we saw for the very first time hedging on that. Now transparency's a desirable but not a necessary goal of the program.

I don't know whether the Board has deliberated on this question about whether it's necessary or whether it's merely desirable, but I would just like to draw your attention to that,

because this, to me, is a huge undebated shift in policy in this program, and I am not aware that Congress has weighed in in any way, shape or form. I have not seen any policy papers on this. And most remarkably that Dr. (sic) Taulbee's paper encompassed that -- that particular statement, that it is a desirable but not necessary goal of the program, in presenting his rationale for the -- for the site profile today. I would like to know who requested that Justice Department opinion. I'd like to know the name of the person. I'd like to have it on the record. I think it should be on the record for this particular meeting. I would like to know which agency and what position and who authorized them to do so. I would like to know what meetings were held in -- with which agencies that developed this policy. Was -- did this originate in the Department of Health and Human Services? Did this question arise in the Department of Labor? Did this Depart-- did this arise in the Office of Management and Budget? Did the Justice Department just wake up one day and scratch their head and say let's look at the Energy

employee comp program -- gosh, I hear there's a meeting in Cedar Rapids; we've got to get there and drop some kind of new information and perspective.

I haven't seen in the Executive Order any role for the Justice Department playing in NIOSH's program. They're to administer the RECA program, not this program. I haven't seen the Justice Department mentioned in any authorizing legislation that suggested that they should be setting your policy or that of the Department of Health and Human Services.

Now I'm not questioning the authority of the office of legal counsel. Did this opinion come from the White House? Was there -- were there meetings at the White House which discussed this? If there were meetings at the White House, who were at those meetings? When were those meetings held? And if there's an opinion with respect to the office of legal counsel, has it been made available to this particular Board and this particular body? What is the legal basis for concluding that due process is not necessary in order for claimants to be able to have their rights fulfilled under the Act?

I'm unaware of any such proscription, and so I guess I would like, as part of the Special Exposure presentation, if NIOSH or if the Department of Labor or if the Department of Justice is here or they can be brought in, could somebody please explain how this descended from outer space into this process? Thank you.

DR. ZIEMER: Thank you very much, Richard. And let me tell you that I don't know if -- I personally had no knowledge of whether or not anyone in this meeting has the answers to those questions. I honestly do not. The Board learned of this as we came to the meeting about this particular -- I don't know if it's a ruling, decision or just a -- somebody's opinion. I have no knowledge -- may be we will learn more about it, but I do want to point out that deliberations on the Iowa information, the report of our contractor and the report from NIOSH will continue in the morning, so many of the questions that you raised perhaps will be answered in that context as we look further into the reports of both our contractor and NIOSH.

This last question, I'm as curious as you are.

MR. MILLER: Well, at a very minimum I -- I hope that at least Dr. (sic) Elliott can tell us where he got the bullet points to put in his view graphs for tomorrow, and maybe that can begin the investigative trail back to its origin.

DR. ZIEMER: Well, certainly -- Larry can certainly share that part with you tomorrow, or with the group. Yes, a question or comment here? Paula?

MS. GRAHAM: It's just something I forgot I wanted to mention.

DR. ZIEMER: Paula Graham, for the record.

MS. GRAHAM: Paula Graham. Okay. It seems to me that -- you know, we fill out these petitions, the workers do, for Special Exposure Cohort and then they go to NIOSH. And then NIOSH I think looks them over -- if I've got this procedure wrong, tell me -- they look it over and then they decide send it to you, to the Board for -- for --

DR. ZIEMER: NIOSH does an evaluation of the petition --

MS. GRAHAM: Then sends it to you.

DR. ZIEMER: -- and we review their evaluation, yes.

MS. GRAHAM: Okay, so I've got that pretty much --

DR. ZIEMER: Right.

MS. GRAHAM: -- down pat. It seems to me that to avoid something like this in the future, I don't know whose job it would be, whether it would be Congress or the Board or who, it might be Congress, that we need to get some rules down, that once a Special Exposure Cohort is sent to the Board neither side brings any more in. You decide what we've got. So each side should be prepared. The one -- what is -- fills out the -- the workers that fill out the Special Exposure Cohort that goes to NIOSH, and NIOSH be prepared, too, and then that's it, you know. You people decide and that would be it. It would avoid a lot of confusion and everything, and it would save money.

DR. ZIEMER: Yeah.

MS. GRAHAM: Thank you a lot.

DR. ZIEMER: Thank you, Paula. Keep in mind that actually this Board does not make the decision. We make a recommendation that goes

to the Secretary of Health and Human Services. NIOSH also makes a recommendation that goes to them. There are some time constraints in the process in terms of NIOSH reacting to a petition and in terms of the Secretary of Health and Human Services reacting to a recommendation from this Board. So there are some constraints in there on time, as well.

MS. GRAHAM: (Off microphone) (Unintelligible) recommend.

DR. ZIEMER: Thank you.

MS. GRAHAM: (Off microphone) (Unintelligible) agree.

DR. ZIEMER: Is there further comments? Yes, sir, in the back.

MR. MOORE: My name is Ron Moore. I worked security, Line 1 at the Burlington facility. You've got a lot of questions about film badges, so I thought I'd give you a little history about film badges.

DR. ZIEMER: Thank you.

MR. MOORE: The first people that died in the Cold War were experimental troops put in Nevada and at Bikini Test Atoll. They were U.S. troops. They set off nuclear blasts. They

died by the hundreds. The doctors studied them for years till they were all dead or mostly dead. Joe Kelley started the Atomic Energy Association in Burlington, Iowa, which is a funny place 'cause this is where most of this mess started with, Burlington, Iowa.

Well, those people died and that didn't seem to bother them 'cause they didn't have film badges and radiation still killed them.

Then we go to the first nuclear reactor accident in the United States in Idaho. The three men that was running the reactor were killed. The seven firemen that went in to find their bodies died approximately four years later, or three. They didn't have film badges, but they died of radiation.

Now we go to Philadelphia where the five doctors were asked by the Atomic Energy Commission to find 300 people they could experiment on with radiation, and they did. Now they didn't give these people film badges, but they experimented on them with radiation and they all died, too. They're in a book.

Now if you go to every AEC facility in this organization, I'm talking Los Alamos, I'm

talking Sandia, I'm talking Rocky Flats, I'm talking everything you can think of, they have a problem because not only are the people in those plants dying -- that had film badges -- the people outside the plants are dying, too, that never worked there and they didn't get film badges.

Now this has been a consistent problem ever since the AEC started and was formed. But the old AEC philosophy was we're run by the old boys' group, the Manhattan Project boys started it, playing around, and if you weren't in the clique, you didn't go up the ladder much, and they controlled and run this thing for years. And this is the problem you still have.

If you would have watched C-Span about a month ago when the good ol' Berkeley people brought in a new man to manage Los Alamos because they've got critical problems all over the place, and they had people running their labs not to SOP and they were told they would have to run to SOP, they said to hell with you; this is my lab, I'm a doctor, I'm a scientist, I'll run it the way I want, so they fired him.

Well, he didn't lose a paycheck because the

good ol' boy club sent him right down to NASA. And this is the way the good ol' boy club works.

Now the way it worked at the Iowa Army Ammunition Plant was, you don't make waves, you don't talk, you keep your mouth shut, you do not turn in incident reports, you hide things, you falsify records and papers. This is documented through people that worked there if you would listen to them. This ol' boy club has operated for years. People are still dying and they will continue to die. They are not addressing the problems that got out of these plants to the other general population. We need film badges for them people. That's how you find out, isn't it?

Apparently film badges is not the answer 'cause people are dying from radiation that had film badges, and people are dying from radiation that didn't have them. This is the system. This is the way this organization works. This is your government at its best.

When we signed the National Secrecy Act we sold ourselves into slavery for life. There are things we still cannot tell you, things that we

will take to our graves. We cannot tell anybody, even our senators, with fear of either your choice of Leavenworth for life or a firing squad. Take your pick, guy.

They've hid stuff, they've lied, they've cheated, they've done things for years and covered this up. It's a damned disgrace and it should be abolished. When you have -- the Department of Energy can go to any facility, and those people get sued, they pay their lawyer bills. Not the company in charge of that facility, the government. That's a disgrace, absolute disgrace.

If you ever read the book that they wrote about Rocky Flats and what they done, and the United States government actually shut down a Federal grand jury that was going to prosecute them. Rocky Flats is the only AEC facility that was ever raided by the FBI. There has never been one since. There never will be another one because of that. *The Ambushed Grand Jury* is the name of that book. It will also show you how much of that exposure got out, how much it spread all over Denver, Colorado. How come people have so much thyroid cancer out there

and types of melanomas? They burnt plutonium and uranium in a smokestack that blew all over hell.

Now gentlemen, film badges and this stuff is not going to solve the problem. We're still going to die until you break up the ol' boys' club. And like we used to say on Line 1 when engineering used to come down and tink (sic) with a unit, there's an old expression that was said -- sometimes they're educated beyond their intelligence. Thank you.

DR. ZIEMER: Okay. Thank you for those provocative remarks. Any other commenters? If not, let me thank you all for being here with us today. We will continue tomorrow morning with discussions on the Iowa facility and then in the afternoon move on, hopefully, to the Mallinckrodt facility. We are recessed till tomorrow morning.

(Whereupon, at 5:40 p.m. the meeting was adjourned until Tuesday, April 26, 2005, at 8:00 a.m.)

C E R T I F I C A T E OF COURT REPORTER

STATE OF GEORGIA

COUNTY OF FULTON

I, Steven Ray Green, Certified Merit Court Reporter, do hereby certify that I reported the above and foregoing on the day of April 25, 2005; and it is a true and accurate transcript of the testimony captioned herein.

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

WITNESS my hand and official seal this the 6th day of March, 2005.

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STEVEN RAY GREEN, CCR

CERTIFIED MERIT COURT REPORTER

CERTIFICATE NUMBER: A-2102