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

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ADVISORY BOARD ON RADIATION AND
WORKER HEALTH

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LOS ALAMOS NATIONAL LABORATORY WORK GROUP
(LANL)

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TUESDAY
AUGUST 15, 2017

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The Work Group convened via teleconference at 11:00 a.m. Eastern Time, Josie Beach, Chair, presiding.

PRESENT:

JOSIE BEACH, Chair
BRADLEY P. CLAWSON, Member
JAMES E. LOCKEY, Member

ALSO PRESENT:

TED KATZ, Designated Federal Official
BOB BARTON, SC&A
TERRIE BARRIE
ANDREW EVASKOVICH, Petitioner
JOE FITZGERALD, SC&A
CHRISTOPHER MILES, ORAU
JIM NETON, DCAS
LaVON RUTHERFORD, DCAS
MUTTY SHARFI, ORAU
DAN STEMPFLEY, ORAU
JOHN STIVER, SC&A

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(11:01 a.m.)

Welcome and Roll Call

MR. KATZ: Welcome, everyone, to the Advisory Board on Radiation and Worker Health. This is the Los Alamos National Lab Work Group. And our teleconference today deals with the latter part of the SEC. And possibly, if we have time, we'll go over and see where we are on Site Profile issues, but we may not get to that.

The agenda and materials that are going to be discussed today, including the couple of presentations, one by LaVon Rutherford, and one by Joe Fitzgerald, they're all posted on the NIOSH website. They're under program, the Board, scheduled meetings, today's date. So, anyone can go there and see the presentations.

You won't see them being presented, per se. You can just view them as the presenters do. And you can also see all the background reading documents that relate to what will be discussed today.

And I'd also ask everyone on the line,

please do not, except if you're speaking to the group, do not leave your phone open, but mute it. And to mute it you press *6. *6 will mute it if you don't have a mute button on your phone. And *6 again will take you off of mute.

And also, please don't put the call on hold at any point, because that will cause problems for everyone else. But just hang up and dial back in if you need to leave for a piece.

Okay. Now, let me just go on to roll call now. And talking about a site, if you'd speak to conflict of interest. The Board Members are all on. None of them have conflicts.

The Members that we have on are our Chair, Josie Beach, and Brad Clawson, Member, and Jim Lockey, Member. And Wanda Munn is on this Work Group, but she's not attending, she wasn't expecting to attend today.

(Roll call.)

MR. KATZ: Okay. So, again, just to remind you all, please put your phones on mute. And at this point I'll turn this over to Chair Josie Beach. It's your meeting.

CHAIR BEACH: Thanks, Ted. This is Josie. And just a point of clarification, Ted. You mentioned there were two slide presentations, and they were listed on the web. Did NIOSH, did you prepare a slide presentation?

MR. RUTHERFORD: Yes. It should be posted on the web --

(Simultaneous speaking.)

CHAIR BEACH: Because I'm looking at the web right now. And I checked it earlier, and it's not there, unless it could be --

DR. NETON: This is Jim. I checked. It's there.

MR. KATZ: I saw it there too, Josie.

DR. NETON: It's a PDF file. It's not a PowerPoint presentation.

CHAIR BEACH: How many pages is it?

MR. RUTHERFORD: Thirty-two, 33 slides.

CHAIR BEACH: Okay. I got it. All right. Thank you. And then, and the other thing we had petitioner comments at the end. And I was curious, Andrew, did you have anything prepared?

Or were you planning on making any comments this morning? And if you're not, that's fine.

MR. EVASKOVICH: I don't have anything prepared. But, yes, I had planned to make some comments.

CHAIR BEACH: Okay. That's great. I just wanted to make sure we get, save time for that. So, thank you.

MR. EVASKOVICH: Thank you.

NIOSH Petition Evaluation Addendum

(1995 - 2005)

CHAIR BEACH: We'll go ahead and start with the NIOSH SEC presentation, take questions, and then move into, I know Joe's got a review of the Addendum, and then additional slide presentation. So, I guess LaVon, if you're ready I'll turn it over.

MR. RUTHERFORD: Yes. This is LaVon Rutherford. Let me know if you can't hear me. I do have the presentation on a computer in front of me. And sometimes the phone gets a little interference. So, I just want to make sure everybody can hear me fine.

MR. KATZ: Yes. Your sound, you're clear as a bell.

CHAIR BEACH: Yes. Great here.

MR. RUTHERFORD: Okay. This is LaVon Rutherford. I'm going to talk about the NIOSH SEC 109 Addendum. I am the Special Exposure Cohort Health Physics Team Leader for NIOSH.

Slide 2, some background information. SEC-0109 LANL petition was received in April of 2008, and qualified in May of that year. The Class evaluated was all service support workers from January 1, 1976 through December 31st, 2005.

The Evaluation Report was approved, Rev. 0 on January 2009. We issued Rev. 1 in August of 2012. And the Addendum, which addresses the remaining years, in April of this year. Next slide.

Previous Board actions. The Board took actions on adding a Class at LANL. They added a Class from 1976 all the way through 1995 for all employees. This was actually the second action taken. Currently there is an SEC Class all the way through the start of operations at

LANL, to the end of 1995. Next slide.

All right. Identified infeasibility included the inability to bound unmonitored intakes of exotic alpha emitters, fission products, activation products, tritiums, especially -- specifically special tritium compounds, Sr/Y-90, Th-230, and Th-232.

During that we committed to continue to evaluate these issues for the post-1995 period. But we had indicated that if the site was in compliance with 10 CFR 835, the issues would effectively be resolved. So, we set the end date of December 31st, 1995 for the Class. Next slide.

10 CFR 835 requires internal dosimetry programs for radiological workers. Under typical conditions who were likely to receive a 0.1 rem or 100 millirem CEDE from all occupational radionuclide intakes in a year.

Given this requirement, in the absence of individual internal dosimetry data, and assuming compliance, intake would be unlikely to have resulted in a greater than 0.1 rem CEDE, and

the infeasibility to reconstruct dose would not exist.

So basically, if the individuals were not monitored they would have received more than 100 millirem. And if they were monitored, we had monitoring data. And so, there is no infeasibility. Next slide.

Since the issuance of Rev. 1 of the SEC Evaluation Report, we sought and received additional information, documents, and procedures relating to post-1995 use of exotic radionuclides.

And what we found was a sporadic use after 1995, meaning ultimately there's fewer bioassay data points, or few bioassay data points. Next slide.

One of the key trips we took out in doing our investigation and reviews was a November 2015 trip with DCAS, SC&A and ORAUT. WE met with the LANL Physics Team, including Managers, Dosimetrists, and field personnel, to better understand how they complied with 10 CFR 835, or how they had achieved compliance with 10

CFR 835.

We looked at documents, a number of different types of documents that were captured, RWPs, respirator use, air sampling, radiation surveys, HP checklists, routine monitoring instructions, and external exposure data. Next slide.

LANL also provided us their policy and procedure documents, background information on 835 implementation, organization charts, non-routine radionuclides handled by waste management, and a summary of their dosimetry monitoring program.

LANL also provided information and documents specific to special tritium compounds. Next slide.

So, the big question is, how do we assess sites during the 10 CFR 835 era? If you think about it, if sites assess an operation and determine that workers are unlikely to receive 100 millirem per year CEDE, dosimetry would not be required.

Therefore, in many cases, especially

with the exotics and some of the smaller projects, we have reduced personal monitoring data. And this is not just for LANL. This would be for all sites. Next slide.

So, NIOSH management had figured during the 10 CFR 835 era, if a site has a Radiation Protection Program approved by DOE, NIOSH will assume compliance unless documentation supports otherwise.

NIOSH will focus their evaluations during this period on internal and external assessments and incident reports associated with 10 CFR 835. Next slide.

So, when we were reviewing our findings, I actually had this same slide in the previous LANL presentation. What we were looking for is, from an SEC perspective do the findings identify unmonitored exposures that may prevent reconstructing exposures to a defined class of workers?

And then, from a DR perspective, do the findings identify a programmatic flaw that would suggest that the unmonitored workers could

have received exposures in excess of 100 millirem per year? Next slide.

Therefore, our evaluation for this Addendum looked at assessments, focusing on findings, responses, and corrective actions. And when I say corrective actions, I think one of these things that -- and I'll get into it a little later, is the corrective actions.

Did they take corrective actions? If, first, those that were not monitored, did they take corrective actions to ensure that they were monitored? And I'm speaking of individuals that should have been monitored.

And with the Nonconformance Tracking System for 10 CFR 835 violations, site response again, and corrective action, as well as the same thing, that is an Occurrence Reporting System. Next slide.

So, we identified May 1995 LANL internal assessment of the Radiation Protection Program. There was one finding associated with administrative controls for sealed sources. And there were five observations.

One, of those five observations, one associated with internal dosimetry. Observation 4 stated that the Radiation Protection Program office has not coordinated with support organizations to implement site-specific document control and records management programs.

Problems were identified with document control and distribution of updated procedures. We reviewed this information. And we determined that this would not affect our ability, would not cause an infeasibility in dose reconstruction. Nor would it affect our 100 millirem CEDE for a worker being monitored. Next slide.

We went to the DOE NSSA conducted -- DOE NNSA conducted an independent review of the internal dosimetry program at LANL in July of 2004.

The stated performance requirements for the assessment included evaluation of compliance with 835.702(a), which is associated with record keeping of monitoring data.

No findings or observations were

associated with 835.702(a), but there were three non-compliances noted in the assessment. None of the findings in the assessment would likely affect our ability to perform individual dose reconstructions. Next slide.

We also reviewed the NTS with the Nonconformance Tracking System for LANL, for 10 CFR 835 violations, site responses, and corrective actions.

We identified 384 reports. Ninety-one were considered potentially relevant. And of those 91 two were considered pertinent to compliance with 10 CFR 835.702(a). And those were records NC ID:652 and 1377.

Records, non-laboratory exposure data was not included in all employee records for current year or lifetime dose. In some cases, when an employee's previous employer provided does information it was not included in the employee's current year or lifetime dose. 1377 was basically the same thing. Next slide.

The findings for the two NTS reports would not likely affect our ability to perform

individual dose reconstructions. When we request individuals, individuals that have covered employment at various sites, we request the monitoring data on those individuals from each site.

So, this situation would not have prevented a problem, should not present a problem for us from the dose reconstruction perspective.

SC&A also identified an NTS report that we overlooked, you know. And I quite honestly can't give you a good reason at all how we missed it. Because this is probably the worst one of them all.

The report NC ID:484 -- and we also did additional review after 484 was identified by SC&A. And we identified another one, 1219, were reviewed using the same criteria identified previously. Okay. Do we have an infeasibility? And do we potentially have a situation where unmonitored workers exceeded 100 millirem? Next slide.

NC ID:484, as identified by SC&A, identified a number of deficiencies, which could

affect LANL's ability to ensure personnel with the potential of receiving a dose great than 100 millirem per year CEDE were monitored appropriately.

The site implemented a number of corrective actions to the programs to ensure this would not happen in the future. And those corrective actions were completed by October of 2000.

However, our question was, what about the individuals that should have been monitored? What actions did they take during that time period?

So, we have reached out to Los Alamos for additional information, requested additional information from LANL as to what the site concluded concerning the potential exposures to personnel who were not monitored. We have not received that information as of yet. Next slide.

NC ID: 1219 identified a deficiency where some workers in TA-55 were not on the appropriate bioassay programs. Some people were, some personnel were in a less restrictive

bioassay.

And so, we had 23 of those individuals. This was caused by a computer software error, believe it or not, a problem with the identification of the individuals. Next slide.

The corrective actions included, computer problems were corrected and tested, workers were placed on the appropriate bioassay program, and line managers were reminded of the requirements to review dosimetry assignments for their personnel.

NIOSH concluded, although the non-compliance occurred, the corrective actions insured no personnel with the potential to receive the 100 millirem were not monitored, CEDE were not monitored.

And that's been not monitored. Should have been a correction to the slide there. And I'll make sure prior to the Board meeting that I do correct that. Next slide.

Occurrence Reporting System. We reviewed the Occurrence, DOE Occurrence Reporting

System for LANL 835 violations, in addition to the Nonconformance Tracking System.

We identified a total, on our initial review, of 159 reports. Of these 159 reports 64 were deemed potentially relevant. We reviewed the 64 in detail and found no findings pertinent to 10 CFR 835. Next slide.

After our initial review and put out the Addendum, we were doing additional searches for Sandia and other sites, and recognized that the search parameters of just putting in the site name would not, it was not all inclusive.

And we found that you could actually put in specific areas, such as TA-55, you could put in the contractor's name, and actually get different numbers of reports. So, after each one in the Addendum we had continued our search in return for reporting systems.

The one thing though that we have found, that it, from everything that we've reviewed today, we have not found a 10 CFR 835 violation without the NTS report. Next slide.

Dose Reconstruction. So, based on

NIOSH's review of LANL's approved Radiation Program, internal and external assessments that followed, NTS report findings, and Occurrence Reporting reports, they concluded intakes for unmonitored workers with access to controlled areas were unlikely to have resulted in CEDE of 100 millirem per year.

I do want to caveat that. That we do need to find out the conclusion to that nonconformance report 484. Find out where that turns out. Next slide.

Methodologies. Bound intakes is, will, bounding intake quantities corresponding to 100 millirem CEDE may be defined as two percent of the Stochastic Annual Limit on Intake. So, you'll hear me say SALI. And that's the Stochastic Annual Limit on Intake.

And unmonitored worker can be assumed exposed to two percent of SALI per year from potential radionuclides. So, for purposes of dose reconstruction the radionuclide and lung clearance class selected for each year's intake would the one resulting in the highest dose to

the organ of interest. Next slide.

Again, that specific two percent SALI nuclide mixture resulting in the highest dose to the organ of interest at the time of cancer diagnosis would be selected.

So, as an example we took a White Non-Hispanic male born in 1965. He started employment at LANL in January 1, 1996, ended his employment 12/31/2016, and was diagnosed with cancer on 12/31/2016.

You can see on the next slide some of the doses, the organs of concern, for example, bone surface. You'll see a separation in years. That was due to a change in the, SALI, I believe.

And Jim can correct me if I'm wrong, between 2000, that was required by 10 CFR 835 in 1996 from 2009 and 2010 to 2016. The bone surface, uranium-234, you can see these are not insignificant doses that we are applying to the organ.

When you take and convert that, you see 100 millirem to an intake. And you apply that intake to an organ, specific organ of

concern. You can see that we end up with 22 percent POC.

And you can go on down, lung. Lung actually has changes in the 2010 to 2016 period, determined, depending on whether it was a never smoked, former smoker, or the greater than 40 cigarettes per day kind of thing.

You can see those doses on that one. So, that's our example DR I wanted to provide. And I wanted to show you that these are not, you know, people here, you know 100 millirem in their thinking. Okay, wow, that's not much. The action facing the organ is a little different Next slide.

Special Tritium Compounds. Potential dosimetric issues associated with STCs including stable metal tritides and organically bound tritium were not formally recognized or addressed by LANL or DOE until the late 1990s.

In 1998 LANL issued a Dose Assessment - Tritium Internal Dosimetry and Bioassay Programs, which specifically addressed bioassay for Special Tritium Compounds. The potential for

significant exposure to STCs was small. And dose assessments were rarely deemed necessary. Next slide.

Now, bioassay data specific to STCs are rare for the entire period of the evaluation. However, if we had a situation where we needed to determine if a worker, or we needed to reconstruct the worker who was unmonitored, we could try the same method.

We can bound unmonitored intakes of STCs in the same manner as intakes of rare nuclides for which internal dosimetry data is lacking by assuming the intakes of an unmonitored worker did not exceed two percent of the SALI.

And that's equivalent to two percent of the SALI for tritiated water vapor. And we would use dose reconstruction for intakes of Special Tritium Compounds using the methodologies in ORAUT-OTIB-0066. Next slide.

Some indication of concerns. I think this is one of the biggest ones. Preliminary Notice of Violation was issued on February 16th, 2007 to LANL.

The PNOV included radiological protection violations for monitoring. The PNOV noted that the Office of Independent Oversight 2005 inspection found that LANL failed to adequately establish personnel and area monitoring for TA-55 hazards of neptunium and radionuclides other than uranium, plutonium, americium, and tritium. Next slide.

NIOSH reviewed LANL's responses and corrective actions. We also looked at the NTS reports related to LANL on that. We also looked back to LANL, this was actually during some of our discussions in November and follow on, in November of 2015.

And we asked LANL for information on the potential neptunium exposure. LANL indicated the 100 gram quantities fell below their monitoring threshold, as documented in their Internal Dosimetry Technical Basis Document.

Subsequently, we did not require, their threshold was a higher level, based on their studies, and would not, not exceeding their threshold did not exceed the 100 millirem CEDE.

Next slide.

So, after reviewing all available information NIOSH finds that the unmonitored workers involved in these operations were unlikely to have received intakes that would have resulted in 100 millirem CEDE.

Therefore, the methodology described earlier for bounding intakes for the unmonitored workers is appropriate for workers involved with the neptunium operations identified in this PNOV. Next slide.

So, for the period of January 1, 1996 through December 31st, 2005 we find that it, NIOSH has, finds that it has access to sufficient information to estimate the maximum radiation dose for every type of cancer for which radiation doses are reconstructed, and could have been incurred in plausible circumstances by any member of the Class, or estimate radiation doses for members of the Class more precisely than an estimate of maximum dose. Next slide.

And this is a slide that we provide that shows the summary. Dose reconstruction is

feasible, all internal and external from January 1, 1996 to December 31st, 2005. And finally, the last slide, questions. Okay.

CHAIR BEACH: Okay. So first, Board Members, do you have any questions for LaVon? Hearing none --

MR. KATZ: Just --

CHAIR BEACH: Oh, go ahead.

MR. KATZ: I'm curious. Someone might be on mute.

CHAIR BEACH: Yes. I was just going to ask that before --

MR. RUTHERFORD: This is LaVon. Can you hear me?

MR. KATZ: Yes. Yes. There you go.

MEMBER LOCKEY: Jim Lockey. Can you, just for, a couple of clarifications. When you go back to Slide 13.

MR. RUTHERFORD: Okay.

MEMBER LOCKEY: One of the dates where the petition seems to be failing, did you see that? I heard one 2002.

MR. RUTHERFORD: Yes. The first one

on 13, it was a May 1995 LANL internal assessment that was done. That was, I'm hoping I got this, the right slide. And then the second one was that DOE NNSA was an independent review in 2004.

MEMBER LOCKEY: Is that when the deficiency is identified, or was it before that?

MR. RUTHERFORD: No. It was identified during that, those different assessments.

MEMBER LOCKEY: Okay. So, it was identified in '95 and 2004?

MR. RUTHERFORD: Right.

MEMBER LOCKEY: And one other question. For those people that weren't monitored, what was the range of exposure?

MR. RUTHERFORD: You know, I don't -- Yes. I don't recall offhand. Chris Miles, Chris Miles with ORAU. He's done a lot of the technical work. He may have looked at that in the, I think you're talking about the situation where, I'm assuming you're talking about the situation where 23 of the 93 workers, that was actually in an NTS report, NC ID, oh shoot, let me find it, 1219.

There were 23 of the 93, were not on the appropriate bioassay. I'm assuming that's what you're talking about. All the other situations -- but first of all, I'll point out that the internal and the external assessments that we have reviewed, there has been no indication provided to us that individuals did not, exceeded the 100 millirem CEDE.

Now, that is without talking about the NC ID: 484, that SC&A brought up, and we overlooked. That one I still have, we still have a little more homework to do on that.

MEMBER LOCKEY: So, for those people monitored, none exceeded the 100 millirems --

MR. RUTHERFORD: Yes. I do not, again, I don't recall the actual values that were given. I don't know, again, if, and Chris, or Jim, or anybody else has anything.

MR. MILES: Yes. This is Chris here. I don't think that report discussed the doses for anybody. It was just an assessment of whether they were likely to receive 100 millirem or more I think.

They were just assessing the appropriateness of the programs that they were on. And they found that 23 of the people, I think they looked at 99 people.

There were 23 of them that were on less conservative programs than they should have been. So, I don't think that report talks about any specific intakes to anybody.

MR. RUTHERFORD: Yes. I didn't recall reading any either. So --

MEMBER LOCKEY: And LaVon, you don't have the intake data, or what?

MR. RUTHERFORD: We have, I mean, we have the intake data. We have bioassay data, a spreadsheet from LANL. But we don't have the specific data for these 93 individuals. We'd have to go back and actually do some additional research on that to see if we could identify those 93, and see what those values were.

MEMBER LOCKEY: Oh, okay.

MR. RUTHERFORD: Attempt to find some additional information.

CHAIR BEACH: So, LaVon, this is

Josie. You said you have a spreadsheet on some bioassay data for LANL? Is that correct?

MR. RUTHERFORD: Yes.

CHAIR BEACH: And what years does that cover?

MR. RUTHERFORD: Oh, gee. Chris, I can't remember the start year. Do you remember the starting year?

MR. MILES: I think that spreadsheet has all the data that we have, I believe.

MR. RUTHERFORD: Yes.

MR. MILES: For all years, I believe.

MR. RUTHERFORD: Correct.

CHAIR BEACH: Well, I noticed in the Evaluation Report, when you're mentioning how many dose reconstructions you've done, how many internal and external, it looks like half you didn't find any internal dosimetry for them.

MR. RUTHERFORD: Yes. Well, if you look at that, 51 percent of the personnel, these are all claimants. This isn't just workers that are inside radiological areas. These are all claimants.

And you've got 51 percent. That's a high number. That's not a low number, you know, that's a pretty good number, 51 percent of those people have internal monitoring data.

CHAIR BEACH: Okay. And I didn't notice, it's not very specific in the DR, what data you do have, what, for this time period, the '96 to '95, the monitoring data.

MR. RUTHERFORD: You mean the '96 to 2005 monitoring data.

CHAIR BEACH: I'm sorry, 2005. Yes, exactly.

MR. RUTHERFORD: Yes. Well, we have a lot of internal bioassay data, both for plutonium and americium. We have a lot of data, actually we have a considerable amount of data for fission, which isn't in activation products.

Most of the activation products were for only accelerator use. And all this data that we have, you know, there's quite a bit of data through that period.

We also, when we were in there in March, we received 2015, and actually during

other data captures, we looked at air sampling, we received air sampling data. We've looked at, we got contamination survey. We looked at their HP checklist. We reviewed their routine survey program.

Their field monitoring program, you know, is really quite extensive. It's, during that, today, I mean, and from what other records I've seen. They have a daily, weekly, monthly, annual frequency on different types of surveys.

They have a lot of fixed air sampling. They have, you know, they do a number, you know, they also do isotopic analysis on actually a percentage of their air samples that come out of specific areas.

DR. NETON: LaVon, this is Jim. We also, we have a unique situation in the sense that we do have some coworker models that we've already developed for Los Alamos.

And we developed coworker models, say for plutonium, through 2008. And actually, I think what you would find is that the exposures are less than what we're probably proposing for

the 100 millirem CEDE exposures, the 50th percentile, at least.

So, in general, the exposures were pretty low. I'm looking at the median excretion for type S plutonium between '94 and 2008. It's .71 picocuries per day. Very low exposures.

CHAIR BEACH: Okay. Any other questions.

MEMBER CLAWSON: Josie, this is Brad. I just, I wanted to go back to this 51 percent that you were talking about, LaVon.

MR. RUTHERFORD: Yes.

MEMBER CLAWSON: You're telling me that 51 percent of the people had bioassay?

MR. RUTHERFORD: That's correct.

MEMBER CLAWSON: Okay. So 49 do not?

MR. RUTHERFORD: That's correct. But again, remember that also includes your administrative staff. And in any situation where an individual was not likely to receive 100 millirem per year CEDE, the sites were not required to monitor for them. And --

MEMBER CLAWSON: But --

MR. RUTHERFORD: Okay.

MEMBER CLAWSON: I understand that. I've lived through that one. And I've watched it bounce around. That's why I found this interesting. But, then going back to what Dr. Lockey was talking about, these 91 people. Now, this was an audit that they came in.

And they come to find out that a certain percentage of the people were not on the correct bioassay program, or being monitored for the right isotopes. Is that correct?

MR. RUTHERFORD: Well, wait a minute. This, the 93 that we're talking about was a nonconformance that was identified by LANL itself I believe. That was not identified externally. This was a specific -- of the, you know, large number of NTS reports that we had. So, this was one example that was identified by them.

And it was, there were 23 individuals that were not monitored at the appropriate level that they should have been monitored. And they took corrective actions to fix that.

The other reports, 484 was the one

that SC&A identified. And it was nonconformance compliance, the 484. That was one done externally by a number of groups. And I can't remember who all was involved in that.

And it did identify individuals that, or situations with, that they felt the personnel could have received more than 100 millirem CEDE. And that's the one that we have asked the site for additional information on.

It's also the one that we do have information the site took corrective actions to fix that situation from that point it was identified. They took the corrective actions and, so it wouldn't happen in the future.

What we looked for, what we were asking for is, okay, what did you do about the individuals that potentially could have been exposed? Did you monitor them. What was done? Those types of things. So we could ensure that the proper, the appropriate monitoring had occurred.

MEMBER CLAWSON: Okay. I, that's the part that I didn't see, that they had a corrective

action. I'm sorry.

MR. RUTHERFORD: Yes.

MEMBER CLAWSON: I just, because usually when you have a report like that there's corrective actions and what they did to be able to get in there. So, okay.

MR. RUTHERFORD: Yes.

MEMBER CLAWSON: Okay. I appreciate it. Thank you.

CHAIR BEACH: Yes. And, Brad, this is Josie. I think you'll hear more about that from Joe. Because he's got that in his write up as well.

MR. RUTHERFORD: Right.

MEMBER CLAWSON: Okay. Yes. I was just trying to get a better handle on that. Because, yes, usually when they have something like that there's a lot of different outcomes. So, thank you.

CHAIR BEACH: And any other Board Members, questions? Joe --

MEMBER LOCKEY: LaVon --

CHAIR BEACH: Oh, go ahead.

MEMBER LOCKEY: LaVon, Jim Lockey. One more question. When you did the basic construction on the hypothetical person, under there it sort of, it's striking to me that 100 millirem is a POC is 31 percent for lung cancer. I mean, it might be an awfully small dose but it has a high impact.

MR. RUTHERFORD: Right.

MEMBER LOCKEY: Am I reading that correctly?

MR. RUTHERFORD: You are reading it correctly. Jim, you can jump in and --

DR. NETON: Well, yes. This is Jim. You have to remember that 100 millirem is what's called a Committed Effective Dose Equivalent. And so, that number represents the weighted summation of the doses to all the organs, based on some weighting factors.

And so, the doses themselves to individual organs are much higher than 100 millirem in many cases. For example, the weighting for the lung is .12. So, it's going to be ten times whatever the rem dose, you know.

So, it's a slightly complicated terminology.

But these effective doses, you know, it's a 50 year committed dose from receiving 100 millirem in that one year. And we do that for every year.

In the case of the example I think it was a 20 year work history. In each case the person received a 100 millirem CEDE for each of every 20 years that they worked.

CHAIR BEACH: Joe, for SC&A are there any questions? Do you have NIOSH's presentation, before you jump into yours?

MR. FITZGERALD: No. I think we encountered some of the same issues. And I think I can raise considerations as part of that.

CHAIR BEACH: Okay. Is there any other questions before I turn it over to SC&A? LaVon, thank you. And, Joe, you're up.

SC&A Review of Addendum

MR. FITZGERALD: Good morning. I'm not going to repeat some of the background information that LaVon presented pretty well. So, in terms of the petition history and the

Addendum, that's all been pretty well covered.

I'm going to jump to, and I'm using my slides. I think everybody should have a copy of those. They're not very lengthy. But I think they highlight the review that we did.

And this Addendum certainly is an interesting one. It's different than a lot of the more technical reviews that we've done. But it does have a lot of precedent for all the sites that would be covered under EEOICPA.

Clearly, I think as LaVon points out, this presumption of compliance based on 835 would apply across all of these sites that would be under SEC considerations. So, certainly the precedent is set, and the implications of doing so are pretty important. So, it goes well beyond Los Alamos.

And as such, you know, I think I made this point in the, in my review, that effectively it's a fundamental policy question that's founded on a number of considerations, some of which are dosimetric.

But as such, we wanted to, as is

SC&A's role, stick to providing, you know, the considerations that might be important for the Work Group and the Board to weigh, in terms of this discussion, because of the implications of making this decision.

So, in terms of lines of inquiry, the first thing we wanted to do is look at the presumption of compliance, the question of assuming the various and sundry dosimetric issues.

The monitoring, record keeping issues would be resolved by January 1st of '96, by virtue of 835 being enacted. We want to provide some perspective on that as, certainly as a starting point.

And beyond that, if one were to decide that particular date, that milestone is in fact the watershed that is being, certainly is being discussed, then how would you actually determine whether or not that was reasonably being implemented or not?

So, those lines of inquiry, you know, the basis for choosing January 1st of '96, and

assuming compliance resolved all these issues, and then going further. And if that is the case, how would you actually, what metrics would you provide to make that determination?

And of course, NIOSH did so in terms of looking at oversight findings that we just discussed. And whether or not that was that adequate.

So, based off of the first one, in terms of the presumption of compliance. And, you know, and my issue, it sounds philosophical, but actually it has its roots in sort of how DOE enacted 835, and how these radiation protection practices were in fact carried out, implemented, and enforced during the '90s.

This is certainly, as was pointed out in the ER, was a time of a lot of upgrades, a lot of, you know, policy changes.

And certainly the question is, you know, is there a point where one could in fact assume or presume that, you know, your fundamental monitoring and recordkeeping practices were such that you could obviate the

need to actually evaluate some of these dose reconstruction issues that we've been weighing, certainly in the years prior to '95?

And my concern, and I think it's expressed in here, is that I think program compliance, which is what 835 in terms of implementation starting in '96 required, and the process that led to that, is not the same as actually implementing these requirements in practice.

And that distinction, I think we went through some pains to at least illuminate that a little bit. Certainly, the program, the RPP, Radiation Protection Program, was required to have the key elements, including dosimetry, internal dosimetry, external dosimetry, in place, and procedures that would implement that in the workplace, and what have you.

And that was certainly validated in '95 into '96; that in fact those programs were in place. But clearly you had situations where the interpretation, as far as whether the procedures did so, and whether or not the actual practices

were being implemented.

In other words, we talk about a provision in 835 that requires that you have, say, radiation work permitting systems, and bioassays, adjusted bioassays, participation, enrollment, all those criteria. You might in fact have procedures that called for that. But, as we have outlined, at least -- we'll probably get into this tomorrow with Savannah River -- but the actual implementation, whether or not the management and the contractor holds workers accountable, whether in fact you get participation, whether you in fact enroll workers in these programs, and whether the monitoring actually takes place, is something that is not validated, essentially, on January 1st of '96.

You validate the program, you validate the fact there's procedures. But in terms of actually verifying whether or not these enrollments and participations are taking place, that doesn't happen necessarily.

The process wasn't designed to, in fact, go to that level of detail in terms of

implementation. The contractor certainly had to validate that they had come into compliance. But, again, compliance is not equivalent to implementation. Implementation requires the necessary sampling and verification at the ground level. And there wasn't time.

I mean, this was something that was moving pretty fast. They had to put teams together, and they had to validate and meet the deadline. So the level of validation we're talking about did not happen, certainly, necessarily, by that date.

So, anyway, I think our major point is that a lot of the work that certainly NIOSH has done, and that we have done looking at the adequacy and completeness of records, of the data itself, if something that doesn't necessarily happen by way of this process. This is a compliance and enforcement process. What we're talking about is the accuracy at the ground level of whether or not the participation in bioassay programs, whether the completeness of the recordkeeping, and whether or not the monitoring

had actually taken place.

And that's something you really don't find from a top-down level. That's something you actually have to do from the bottom up.

And that's one, still staying on the same slide, that's one shortcoming of on relying on things like ORPS and oversight findings and notices of violation to pick up. Because, almost by definition, they're not designed to verify whether or not the procedures that you have in place, and whether or not the actual management is supporting a particular practice.

That comes from, I think, the level of self-assessment that is evident, frankly, in what Los Alamos did in 1999, which I'll get to in a minute. But that's something you really essentially have to go down and actually sample and survey. And that's something that a typical regulatory oversight program doesn't do.

And I guess the other thing I would cite is that, you know, certainly '96 is a milestone. But so was '89, '92, I would say '98, and 2002. I mean, the program at the DOE sites,

in terms of radiation protection, was very much a evolutionary program. It wasn't any single time that these programs, in particular the dosimetry programs, rose to a level, uniform level of functionality. It was something that took time.

I mean, the policies and the regulations ratcheted up expectations, ratcheted up accountability. But a lot of these programs were very much embedded in the ways the contractor practiced them. They weren't turned around overnight by a piece of paper. It took a great deal of time and effort, as well as the different upgrades in the policy and programs, to bring the departmental programs up to a level of uniform implementation.

And as I said in the evaluation, one could argue that, you know -- and different sites had different levels of progress -- but in terms of uniform level of performance or functionality in dosimetry, that really did not happen until you coupled the dosimetry standard with the DOELAP Accreditation Program and actually had

some very firm deadlines.

I know for internal dosimetry it was January 1st of 2002 where the sites had to have, not only on paper, a program that satisfied the requirements of 835, but they had to withstand the evaluation of independent outside reviewers that the actual practices, the functionality of the program, satisfied that internal dosimetry standards.

So, you know, to me, when we talk about a presumption of compliance, or a presumption of anything, you're talking about an understanding that in general your programs are going to satisfy the expectations of the requirements and of the programs, with rare exceptions, I guess you might say.

And I don't think that happened on January 1st of 1995. I think you are talking about a progression that perhaps somewhere in the late '90s up to the accreditation milestone of 2002 across the DOE that you had programs that certainly could be certified as being fully functional against those requirements.

Anyway, beyond this question of presumption, I just basically wanted to walk this thing down. I think, again, NIOSH did a pretty thorough job of walking down the implementation or compliance against the various reviews that you could apply against it.

There's nothing particularly magical. I think I identified three areas of interest. The first of whether or not there was a thorough and valid review process. The second is whether or not there was any evidence of nonconformances. And the third one was basically, quite apart from nonconformances, was there any clear inadequacies from a technical or program standpoint that would stand as exceptions to this?

And on the first issue, as I indicated in the review -- and this goes into a lot more detail there -- the process that followed by Los Alamos is very much similar to the process followed by all the DOE sites. You know, they had to validate by about mid-1995 to their headquarters program offices and field offices that the RPP, the Radiation Protection Program,

satisfied the basic elements of 835, and withstand some validation that the procedures at the ground level were likewise in conformance.

But I wanted to point out that it's not quite the holy grail in terms of the validation that we would like to think happened by January 1st of '96. That really was a speeding process. Certainly, the process of trying to get everybody to have a RPP defined, to have that RPP reviewed -- I know for Los Alamos, for example, on the RPP they had to satisfy any outstanding nonconformances that came out of the Rad Con Manual from a few years earlier.

So there was a number of loose ends that had to be resolved before that was done. And that process did end up being accepted. And they were approved by late '95.

But I wanted to point out in our review that there wasn't really any acceptance criteria that the sites could use. I mean, there was implementation guides that were under development by DOE. Those weren't available in time for the process to use. They came out late

in '95.

And also that, quite apart from any uniform acceptance criteria, the sites were given quite the latitude as to what extent that their existing programs met 835. And I provided some excerpts from the RCC, the Radiological Coordinating Committee, that DOE made use of. This was the committee that oversaw the implementation of 835 DOE-wide.

And I think that kind of gives one a perspective of the discussions and the concerns that were expressed at that very time, that, you know, it was one that was driven by the sites. And to some extent there was concerns that the sites had too much latitude as far as interpreting how that would be applied.

I just throw that in because I think, while there was a deliberate process in place, it was one that certainly a lot of leeway was built into it.

The second issue I want to just touch on, and I think LaVon mentioned this already, is that looking at the various noncompliance

tracking systems, ORPS, oversight reviews. I mean, I looked at the Defense Board recommendation, and a number of the incident reports. You know, there's a lot of, lot of oversight reviews. But I think the one that's most telling is the one that we cited, the 484.

And this one I think has a lot of implications. First off, it's 1999. This is several years after implementation. I don't know if anyone picked up on the parties that were involved in the review, but I think that's likewise telling.

You know, Los Alamos, one of the premier laboratories in the country, in terms of having the need for a self-assessed internal dose evaluation, reached out to MJW and Savannah River to be the outside reviewers of this program.

That, you know, one could say it's a little bit of a head scratcher, because you would think a lab like Los Alamos would reach out to Livermore or Sandia, or Mound -- not Mound, but maybe Brookhaven, or somebody, you know. But Savannah River and MJW, specifically. And,

again, we didn't have time to run this down to ground, because of the timeframe. But it should be pointed out that MJW, with its knowledge of the Mound non-compliances on bioassay in 1997, and Savannah River having gone through its major Notice of Violation in 1998.

You know, again, somewhat circumstantial. But nonetheless, clearly Los Alamos reached to those two sites, and people that would be knowledgeable about this issues of job specific bioassays at those two sites, to review its own program to get ahead of the curve, you know, under Price-Anderson.

If you suspect or know that you have a fairly serious noncompliance programmatic gap, something that would indicate that you are falling quite short of the regulations, you're obliged to do a self-assessment and self-report as soon as possible. Otherwise the enforcement mechanism provides for greater penalties, or certainly greater consequences.

And this particular case, what the MJW and SRS folks, as well as some of the Los Alamos

folks, found were issues that were very similar to what were found at Savannah River as well as Mound in the previous year or two.

And in those cases they found issues, fundamental issues with, you know, lack of participation in job-specific bioassay programs. Now, they did a very limited sample in this case. But they found in one RWP -- and I won't use the exact numbers, since they were redacted -- but, you know, 40 percent, on that RWP, did not participate in job-specific bioassay.

That's pretty close to the kind of nonparticipation rates that were found in samplings at the other two sites. So, certainly that's an issue.

Certainly, the other item, you know, Johnson Controls is the major site subcontractor, one that would employ the CTWs at Los Alamos, was enrolling all workers potentially exposed to nuclides into the appropriate bioassay programs.

Now, in the report, or in the memo, I kind of put an asterisk in all of this because the findings were, again, I think very qualified.

They were very careful to say some workers were not complying with their RWP, some workers were not completing their checklists, and Johnson Controls was not enrolling all workers who were potentially exposed.

And, you know, they almost had to do that. Because, again, this had enforcement implications under Price-Anderson. And one cannot overstate, if you've only done a limited sampling, this was a limited sampling, you can't overstate the basis of your findings, because they would carry the weight of regulatory enforcement.

So, in this case, I think the team spent three days looking at a limited number of RWPs, and checklists, and what have you. And that was the basis for these findings.

But I think, you know, as we're looking at some considerations, we don't know the scope of this. I understand that NIOSH is exploring this with Los Alamos, trying to find out. But we may never know the scope, in the sense that the review team probably just did a

limited, very limited sample over the few days they had.

But this raises some questions. And the same questions that we're raising, I think, as Savannah River. If you, you know, have a problem with your bioassay participation and your program enrollment, it's very clear that you have a question that rides on the completeness and accuracy of your database.

And the scale and scope of that incompleteness or inaccuracy is something that you're not going to be able to know without doing a fair amount of leg work. And this is something that a presumption of compliance will not get you. And that's the concern I would have.

And these corrective actions, I mean, that were indicated, you know, and the scale -- and you're talking about a post-835 corrective action program. It's pretty broad. I mean, it's very similar to what Mound and Savannah River had to go through in terms of reordering their bioassay program as well.

Now, again, establishing a web-based

Dosimetry participation verification program to ensure better management of worker bioassay participation, the development of LANL-wide dosimetry enrollment criteria. If you don't have adequate enrollment criteria, I would contend that, you know, you really don't know where you are in terms of the scope of the program.

So, certainly that raises some implications as to, you know, what was the existing program before that, and whether or not that was adequate. And I can go -- you know, it's in the report. But revising the checklist procedure, the bioassay enrollment procedure, the bioassay kit procedure, radiological dose assessment process, the special internal dosimetry and bioassay process, terminations. It's essentially almost the entire program.

So, yes, it does raise a question. So do the violations that were highlighted at the other sites. So, this goes back to the question of presumption, you know. The presumption certainly carries weight if one can show it applies more so than not.

But, you know, I just would suggest that just looking at the few sites that come to mind, all of them have shown some pretty fundamental issues on the bioassay programs, in that '97 to '99 timeframe.

So, it's pretty clear that even though 835 was enacted, the actual implementation lagged quite a bit behind that. And I think that's something that we have to keep in mind.

The other issue I want to raise is just, and this has, certainly has implications for the Work Group. Because the Work Group has a number of outstanding SEC related issues that were carried over from the last SEC period.

And the question, I went ahead and put this in my memo of last, I guess it's April or May is, you know, these are questions about how one monitors the mixed activation products, the mixed fission products, and exotics.

And the question is, if in fact the monitoring information and data were inadequate up through the end of '95, what has changed in '96 that would ameliorate those kinds of issues?

And if one can't be confident that the enactment of the actual regulation on January 1st did that, then I think all those issues certainly are standing to be resolved.

And I guess the only, the last thing I have on my list, and, LaVon, I don't think you mentioned it. We did talk about this, which was on neptunium, that was certainly an issue that was raised, I believe by the petitioner, and addressed in the ER Addendum.

And as we say in the report, we don't think it's a settled issue. We did take a look at NIMS, the inventory system that DOE operates. And we still think there's a question about other source terms, and perhaps other operations that need to be addressed on that.

Finally, this last page, just considerations for the Work Group. Again, I think the good, to me this is kind of a policy question, and something that the Work Group has to wrestle with. But we wanted to provide some considerations for your review.

But I think the presumption of

compliance represents a significant precedent. And really the issue is, should presumed compliance preempt a deliberative review of program implementation if in fact one can point to enough examples where implementation certainly lagged the compliance?

And the significant compliances for at least three sites, including Los Alamos, regarding respective bioassay programs, illustrate this.

And if one wanted to look for milestones on that continuum I discussed a little earlier, one could certainly look at the functionality of the bioassay program that's represented by the accreditation standards that were put in place in '98, and then implemented by January 1st of 2002. That's probably a better lower common -- lowest common denominator as far as practice than something earlier.

And finally, as I just discussed, the continuity and coherency of the technical evaluation is important. I mean, we spent a lot of time in the Work Group, and I think you can

remember this.

It was about three years' worth of discussion on some of the established bioassay deficiencies, the air monitoring gaps that were apparent before '96. And, you know, what's happened to those?

I mean, are those in fact mitigated by the rule coming out? And is it different? Is there a difference on the technical level?

That's it. I mean, I think there's a more detailed discussion. You have the report. But that's kind of where we're at right now.

CHAIR BEACH: Thank you, Joe. Questions for Joe from Board Members? Anybody on mute or -- I think you've stunned everyone, Joe.

MEMBER CLAWSON: Josie, this is Brad, I'm good.

CHAIR BEACH: Thanks, Brad. Jim, anything for Joe?

MEMBER LOCKEY: Joe, Jim Lockey.

MR. FITZGERALD: Yes?

MEMBER LOCKEY: In your presentation you used the term "substantive implications for

dose reconstruction." Can you further define that use of the term for me, what do you mean by that?

MR. FITZGERALD: Well, you know, the rule covers everything from what your signage should be in the workplace to, you know, what your records should look like.

I think what I was talking about was the portions of 835 most relevant to the dose reconstruction that NIOSH is charged with and I think NIOSH did a good job in its ER identifying some of those provisions, one of which was the 100 millirem a year CEDE where everybody, you know, with that potential would be monitored, and when I call it "substantive" I'm talking about those aspects.

And when I talked about the non-compliance 484, in particular I think we were highlighting that there were a number of findings that went right to that particular issue, that these were substantive findings of non-conformance with portions of 835 that go directly to who gets monitored and the 100 millirem a year.

MEMBER LOCKEY: Okay. And then one other question. When, was it 835, that was the January 1996, correct?

MR. FITZGERALD: That was enacted -- yes, that was enacted or implemented January 1st.

MEMBER LOCKEY: Was there any lead-up, did the DOE sites have any lead-up that that was coming down the pike, this is just for my edification, and preparation time, or how did that come about?

MR. FITZGERALD: First off, a lot of the provisions, and I think even NIOSH would agree, they had this in their ER, a lot of the provisions were carried forward from DOE Order 5480.11, which was implemented in '89.

So we're not talking that, talking about the specific technical provisions being dramatically different, there were some upgrades.

But fundamentally it brought forward a lot of the provisions that were already in place in 1989, including the 100 millirem a year. Now the sites were directly involved in the development process of 835, there was a lot of

coordination going on.

I mentioned this RCC, that was chaired by one of the field offices, I think it was Albuquerque, and all the field offices and headquarters programs were a part of that. This was all HPs, so every step of the way there was knowledge of what 835 would have in it.

When the rule was approved, which was about, I think it was some time in '94, about 18 months ahead of the deadline, it had in it some timeframe for reviewing individual programs, looking for needs for exemptions, and certainly marshaling a process that, you know, starting with self-assessments by the contractor and then followed by external review by the DOE Program folks.

You know, that all led to this deadline of having this thing become effective and enforceable under Price-Anderson. That was the key, became enforceable under Price-Anderson on January 1st.

Now I might add that, you know, whereas the for-profit contractors, like, you

know, DuPont at Savannah River, EG&G at Mound, were liable for civil penalties.

Los Alamos was not. The non-profit contractors were exempt from actual monetary penalties, so they could be cited, but there would be no actual monetary penalties. So -- but that, again, took place on January 1st.

MEMBER LOCKEY: Thanks.

CHAIR BEACH: And, Jim -- or sorry, Joe, this is Josie, is there anything moving forward for the Work Group?

I know in your report you mentioned that traditional validation and verification sampling for adequacy and completeness is something that we do at all sites, is that something we could do in this case?

MR. FITZGERALD: Well, the first thing I would say is that it's up to the Work Group. Clearly, NIOSH is following up on that 484 Notice of Violation to get more information, background information on, you know, what corrective actions they took and who may have been missed.

But we're talking about trying to do

a completeness survey of something 20 years ago at a site and, you know, you would have to, I think -- I'm speaking from firsthand knowledge having just done that at Savannah River, you would have to locate the, you know, RWPs where you had exposure potentials, you know, that would be 100 CEDE, 100 millirem CEDE, and then you would have to look at whether or not, you know, the workers who were on those RWPs were in fact monitored.

But, yes, I mean it's possible. I'm just saying it certainly would not be easy at all, but that would be about the only way you could verify, you know, what I think the outside review team could not verify given the three days they had.

It was a 3-day review. I mean I can't imagine, they probably only had an opportunity to look at very few pieces of paper, checklists and RWPs, in terms of those findings, but it was a knowledgeable group.

I think it was the same group as I was saying earlier that dealt with the violations at

Savannah River, were knowledgeable about the violations at Mound, that's why I think they were handpicked by Los Alamos to come in and actually scrutinize their bioassay program.

So it was very clearly with something in mind to address an internal concern over the accuracy of the job-specific bioassay program and the enrollment program that Johnson Controls was implementing.

So there were some, you know, there was certainly some knowledge ahead of time, which is something maybe NIOSH can also check on, which is, you know, clearly there was some concern by the lab over the program that led to the invitation to bring in these specific outside players to actually take a look and see whether or not these issues existed at Los Alamos as well.

DR. NETON: Josie, this is Jim. I think we'd like to explore this a little further before the Work Group would start changing direction and going down to verifying this in a traditional way that we have done.

We are set to present this to the full

Board next week and I think I'd like to have a little more discussion on this that might help elucidate some of the points that Joe has made, or at least to mention counterpoints.

CHAIR BEACH: Yes. No, Jim, I agree with you. I didn't want to make any assignments or anything, I was just curious just for more reflection on --

DR. NETON: Right. And if I could I have a couple comments maybe on Joe's, nothing --

CHAIR BEACH: Yes. No, please, I was going to ask you next. Go for it.

DR. NETON: Okay, if everyone else is done on the Board asking questions. Yes, I think this is -- Joe is spot on that this is a precedent-setting approach that NIOSH is putting forward, and we recognize that.

We feel a little bit different than Joe, obviously, that the 835 era does represent a paradigm shift in the DOE operations, and Joe just pointed out pretty well that these earlier precursors, like 5480.11 and the Rad Control

Manual, were really contractual obligations by the contractor where on January 1, 1996, it became a legal requirement, it was the law, and it was subject to criminal and civil penalties under Price-Anderson enforcement, as Joe said.

And even though Los Alamos being non-profit I don't think we're subject to -- he's right, subject to civil penalties and certainly subject to criminal penalties.

And if I remember correctly when I worked at Argonne even though -- they couldn't dock your award fee based on non-compliances. They couldn't force you to pay a fine.

So I think there is a lot more legal teeth behind this than those other, essentially were guidelines and contractual obligations.

Secondly, I think Joe trying to tie, or suggesting to tie compliance with DOELAP is maybe not correct, because DOELAP was really not a dosimetry standard at all. It was a measurement, performance standard tied to ANSI 13.30.

It had nothing to do with the 100

millirem monitoring requirement at all. It had to do with how well you could measure an analyte in an bioassay sample. So I don't think that really is a good way to go.

And, third, I think -- I agree that the implementation of 835 is probably -- there is a lot of nuances in 835 and implementation guides weren't in place, but we're not talking about overall compliance with 100 percent of 10 CFR 835, we're really talking about is there a program in place to ensure that a 100 millirem CEDE monitoring requirement was in place.

It's a very narrow subset of 835, albeit a very important subset, and we'd be happy to discuss some of the bioassay deficiencies that Joe has pointed out in some of these audits and such, but we'd like to couch that in terms of did that really prevent, does that really mean that using the -- assigning 2 percent of the occupational exposure limit for workers is not bounding on the category of workers who were not monitored.

That's really what we want to get to,

is can we bound unmonitored workers by assigning 2 percent of the occupational exposure limit, and I still believe that we have a pretty good case to make here although I also agree that some discussion needs to take place. That's all I had.

MR. FITZGERALD: Jim, what was the first point again? You were -- I was trying to catch up with the --

DR. NETON: Well, 835 was not just a contractual obligation, it became a law at that point subject to civil and criminal penalties.

MR. FITZGERALD: Yes. I guess my only comment, and I think I mentioned this in the report is, and you are certainly aware of this from your experience at Fernald and other locations, is that, yes, there certainly was a series of policy milestones and upgrades, Tiger Teams, everything.

The 90s was a pretty active period. But the reason why it took time was you had very much an embedded safety culture at the various sites, some more so than others, where the

program, not to mention the Rad Protection Program, felt strongly that they had a fully, not only compliant, but a very world-class operation and it didn't become apparent until you had external reviews, you had the enforcement program in place for a years and whatnot before even these programs became cognizant that, yes, from an implementation standpoint, yes, we might have a very solid program with excellent procedures, excellent expertise, in terms of the health physicists managing those programs, but you know what, it turns out that the CTWs are not participating in the bioassay program.

It turns out that even though the RWP required the urinalyses to be left behind they were not.

So there is issues that, you know, certainly go beyond whether or not it was, quote, "a legal" requirement and I think there was good faith implementation and good faith compliance against 835 but you had some very deep-seated cultural issues as far as the programs that are in place.

These programs are in place for 30, 40 years. In fact, some of these labs essentially invented the health physics program as we know it and some of the people that were in charge of those programs were the leaders in the field.

So, you know, it's a tough issue and I think it did take time even with the passage of 835 before the program came, before these programs came up to a level of uniform conformance with expectations.

And I think even with 835 I think the Department understood that it was a very important means to leverage this but it wasn't going to happen overnight either.

So the only caution I would throw out on that is that when we talk about presumption of compliance on January 1, 1996, I think we have to qualify that by saying, yes, these programs did not magically have that capability and capacity to implement even the essential parts of the programs.

We talked about the 100 millirem, that's a difficult, you know, that's a difficult

provision of 835 to evaluate or to oversee. I mean that's an expectation, you know, that these programs had the capability and the knowledge and the procedures to actually weigh who would get bioassayed and to implement that effectively.

And I think some programs did, some programs took time, and it took DOELAP to actually force the issue in the end on some other programs.

So it wasn't a uniform process and certainly I think one has to be cautious about assuming January 1st was the -- you know, everything, you know, was transformed at that point in time.

As far as the DOELAP standard, yes, you know, certainly that was something that was connected to 835 with the amendment in '98, but that was I think the first time that the functionality of the dosimetry programs was actually put in place, within the confines of 835 with some of the --

DR. NETON: But it had nothing to do with dosimetry, Joe.

(Simultaneous speaking.)

MR. FITZGERALD: Yes, but I think that's -- by making it attendant to 835 as opposed to a separate program.

DR. NETON: Well, I understand. But you could be 100 percent DOELAP compliant and not be compliant with the 100 millirem monitoring requirement. You could be DOELAP accredited and you've not brought about your ability to monitor workers with 100 millirem CEDE.

(Simultaneous speaking.)

MR. FITZGERALD: -- I think it would certainly make it much more likely that you wouldn't have 80 percent of your job-specific bioassays not being collected and how that --

DR. NETON: I don't agree with that, Joe.

(Simultaneous speaking.)

DR. NETON: I've run two DOELAP programs, Joe.

MR. FITZGERALD: -- review and actually demonstrate that.

DR. NETON: No. I've run two DOELAP

programs and they're not connected at all.

MR. FITZGERALD: Well, we'll leave that for further review, but I'm just saying that I think that was certainly a very strong aspect of the '98 amendment and certainly in the 2002 enactment.

CHAIR BEACH: Okay, thank you. NIOSH, LaVon, any other questions for Joe, and any Board Members, anything else?

MEMBER CLAWSON: Josie, this is Brad, I just want to mention something. You know, we've been talking about 835 being implemented and everything else like that, and there is another program the Department of Energy uses, which is Lessons Learned.

I want us to use a little bit of lessons learned in almost every one of these sites that we have dealt with already, and, yes, it was implemented January 1, 1996, but it was not put into place at many, many of these sites until way, way later and we have been in a continuous fight with this over the years.

You know, you can take examples of --

well, I don't want to call each one of the sites out and stuff like that, but they were being fined in 2003, 2004, for not abiding by this.

I don't really see how we could -- we can use this as a marker to be able to start saying in there, but to be able to say January 1, 1996, everybody went, wonderful, they were still trying to figure out -- each one of these sites is so unique they were trying to figure out how to implement it into their own programs and be able to get it to work because the 835 implementation was to try to get everybody on the same page to be able to be doing the same programs the same way.

And I really have a hard time saying that we can use that date because I haven't seen it work at any of our sites yet.

CHAIR BEACH: Yes. Yes, I agree with that, too, Brad. So that's -- we've got our work cut out for us determining exactly what that date may be. So --

MEMBER LOCKEY: Josie?

CHAIR BEACH: Yes?

MEMBER LOCKEY: This is Jim Lockey. I want to follow-up with what Brad just said. What I still don't -- what's not quite clear to me about 835 is, were the civil and criminal penalties in place as of January 1, 1996? If that is indeed the case it seems to me that there had to be a lead time for these various facilities to make changes and implement the program before that date.

I mean it's just hard for me to believe that there would be a rule issued that as of this date there are civil and criminal penalties without a one or two or three year lead time for facilities to reach that.

MR. RUTHERFORD: Jim, this is LaVon. I want to point out that there was a lead time. The sites were to be in compliance by January 1, 1996. At Fernald we were working on that compliance two years ahead of that time.

We also were implementing, you know, 5480.11, a DOE Rad Con Manual, all of those things in sequence up to that point. We knew 10 CFR 835 was coming.

So I can at least speak from a Fernald perspective, there was definitely an implementation that occurred two years prior to the actual finalization of the rule on January 1, 1996.

MR. FITZGERALD: Yes, I would add to that, and I think I said it earlier, Jim, that, you know, it was understood from the enforcement program policy that, you know, they would mitigate the penalty and the level of violation for sites if they, in fact, self-identified any non-conformance that came up and self-corrected them in a timely manner.

I mean there was a heavy qualifying factor on that that, you know, you find it before we find it and it will be less consequential to you, and I think these sites understood that and that's one reason that you see I think a lot of these self-assessments in the several years after enactment that led to some identifications.

Now there was Notices of Violations written anyway because some of these were so significant that it was hard not to be some

penalization under Price-Anderson, but I think there was that period of time where self-identification and corrective action was being looked for.

CHAIR BEACH: Yes, I know --

MEMBER LOCKEY: That's really helpful. Those comments are helpful.

CHAIR BEACH: Yes, and I know NIOSH has more work on the 484 and that was issued in 1999, so I know there is more work to be done here and we'll look forward to seeing that.

Any other comments, questions, clarifications before I move to the petitioners' comments?

(No response.)

CHAIR BEACH: Okay. If the petitioner on the line, Andrew, and I don't know if, Terrie, you have any comments, but, Andrew, if you have any comments you are welcome to make them at this time.

MR. EVASKOVICH: Yes, I am here. This is Andrew Evaskovich. Basically I just have some questions. I am inferring that they are relying

on TA-55 data for the exotic radionuclides and there are other areas.

Back in November at the meeting I raised the issue of spallation product from the accelerator. I haven't really seen anything, you know, replying to that, and I believe I submitted, you know, other documentation before that about the spallation product.

Also, I have a question about neptunium, was it only at TA-55 or were there other areas and the weight amount, you know, is 100 grams the maximum or were there higher amounts?

I have heard that more work needs to be done so I am hoping that the Work Group recommends to the Board that the evaluations continue until all the issues are settled.

Another issue I think that is still up in the air, I think Joe has it in his response, was the catalog for the in vivo measurements, they're very limited or non-existent so they didn't have the ability to determine if somebody was exposed to an exotic as opposed to, you know,

a common.

And there is more work that I need to do as far as presenting so I am going to try to prepare a paper in the next week for the meeting and also provide additional comments during the meeting, but I am just asking that the Work Group recommend that work proceed on this, to recommend to the Board that work proceed on this because it's not settled.

And that's pretty much what I have to say today.

CHAIR BEACH: Okay, thank you, Andrew.

DR. NETON: Josie, this is Jim. I'd like to comment maybe on that in vivo question that Andrew raised.

CHAIR BEACH: Yes, please.

DR. NETON: Yes, I am surprised, in SC&A's report that they suggested or stated I think that they used Phoswich detectors only to measure fission activation products and that certainly doesn't seem to be true based on my review of the SRDB, Site Research Database.

There was a 1983 report put out, SRDB

133601, that is a very detailed technical discussion of their in vivo measurement arrangements in that era, and, yes, they did use Phoswich detectors but they also had a lithium-drifted germanium detector underneath the body on a stretcher to measure whole body fission activation products, as well as a germanium detector positioned over the liver, and that seemed to have been in place for quite some time.

We went back and looked at the in vivo monitoring data from 1978 to '95 and there was at least 3,600 reported measurements of fission activation products and the geometry line is "GeLi detector, whole body."

So I am not sure where Joe got his information on Phoswich detectors being used for fission products, but I don't think it's true.

MR. FITZGERALD: Well, these were quotes from staff interviews from a 2010 report that has already been issued and it's in the references to this report.

DR. NETON: Well, I can tell you [identifying information redacted] put out a 1983

report with a very technical discussion of what they did and it certainly, and, again, the results that we had in the database indicated it was a germanium detector measurement, so --

MR. FITZGERALD: Okay. Well, again, we haven't had this discussion because, and I don't think the Work Group has met, but the 2010 report that was issued by SC&A, that these are basically the dosimetry staff interviews that were done with the Los Alamos staff, so, you know, that's something we can certainly have further discussions on.

DR. NETON: Sure.

MR. EVASKOVICH: I seem to recall that there was a Tiger Team finding about the Phoswich detectors as opposed to the germanium detectors, also. I'll have to find that information.

MR. FITZGERALD: Yes, this is going back, well, 2010, it's going back seven years, so it's a little fuzzy at the moment, but I -- and this is just one illustration.

There is a number of I think these monitoring and record keeping issues that -- and

there are monitoring issues that the Work Group highlighted certainly in the last SEC period of review and these are still outstanding, you know, in some regards for post-'95.

So, you know, that was just an example, but there is a number of issues, and these are highlighted in the Site Profile memo that was sent a few months ago that as far as loose ends from previous Work Group discussions these were certainly issues that were to be addressed in the post-'95 era.

Now they've been preempted, because, again, I think the policy of a presumption of compliance would certainly negate, presumably negate all of these issues, but, you know, these are certainly issues that were outstanding before.

CHAIR BEACH: Okay, thanks.

MR. FITZGERALD: And the other thing I was going to mention, on neptunium we did have a conclusion for that particular issue that other sources, other operations that might involve neptunium as one of the exotics needed to be more

fully addressed and the inventory used as a basis for looking at that, so I think that remains an outstanding issue.

CHAIR BEACH: Okay, I agree. So any other comments, petitioner comments?

Petitioner Comments

MR. EVASKOVICH: No, not at this time. Thank you.

Action Items

CHAIR BEACH: Okay. And so action items moving forward, what I see is I know SC&A's memorandum came out in July, typically NIOSH will give us a White Paper answering or questioning SC&A's paper.

So, NIOSH, are you planning to do a paper for that?

MR. RUTHERFORD: Yes. Josie, this is LaVon Rutherford. We'll do that.

CHAIR BEACH: Okay. So that's one action forward. And I know, LaVon, you talked about in your site presentation some of the petitioner concerns that you addressed, can we look through, I know we haven't had a meeting

since 2012, but I don't know if NIOSH can do it or SC&A, go through petitioner questions and just make sure we haven't missed anything for a following Work Group meeting, is that something that someone can tackle?

MR. RUTHERFORD: I don't mind doing that. I mean I think it's part of our responsibility anyway, so I don't mind taking care of that. This is LaVon Rutherford.

CHAIR BEACH: Okay. And, LaVon, I know I looked through some of Andrew's reports from the past, so I guess just -- there are several out there, just make sure we haven't missed anything that needs to be addressed.

MR. RUTHERFORD: Okay.

CHAIR BEACH: And then moving forward, is there anything else? I know we do have the Site Profile report from SC&A. I don't think we are ready to tackle that yet, is that correct?

MR. FITZGERALD: Well, like I said earlier, it's moot until one --

(Simultaneous speaking.)

CHAIR BEACH: Right, right.

MR. FITZGERALD: -- references this presumption of compliance question.

CHAIR BEACH: Okay. So that paper we'll just keep on hold until we are finished with the SEC question. Anything else I am missing, actions items that we need to address moving forward?

(No response.)

CHAIR BEACH: I know you're going to report out both SC&A and NIOSH at the Board meeting. Unless we are overruled I suspect the Work Group will have more Work Group meetings after the Board meeting to work out some of these issues. Anything else?

MR. KATZ: Josie, this is Ted. Yes, just a question really. One of the reasons we are having this meeting in Los Alamos is because you wanted the opportunity to solicit input from the public that might be germane to following up on these matters that we are tackling right now.

CHAIR BEACH: Right.

MR. KATZ: So I guess my question is just whether Joe, anyone, could display as part

of his presentation any questions that might be germane as to, for example if you are looking for certain kinds of expertise from the public that would be helpful for the path forward or what have you, but anyway it's an opportunity, that's why we're holding this meeting in Los Alamos.

So I would just hate to lose the opportunity just because we didn't give it full consideration -- so I don't know whether Joe or anyone had thoughts immediately, but anyway this is an opportunity, you have the public, they're going to be listening attentively to this session and if you're looking for certain people or what have you for that kind of expertise for some of the questions that are on the table this is a good -- this is why we're going there, so. That's it.

CHAIR BEACH: Right.

MR. KATZ: Yes.

CHAIR BEACH: I guess I don't know how to move forward with that to get the right people in attendance to get some questions answered, so --

MR. KATZ: Right. Well, you never know who's in attendance, it's just a matter, again, of whether --

CHAIR BEACH: Right.

MEMBER: We've done this at other places where we have actually put things on the table as, well, these are some of the questions that are facing us and that leads people to either come or read the transcripts or what have you. You might find somebody that actually knows something about what you want to know.

But, again, I don't really expect anyone necessarily to be able to answer this question now, but you might want to think about that since, that's the point.

CHAIR BEACH: Okay. Right, that makes perfect sense. Thank you. Okay, so any other comments, any other sort of path forward, anything I might have overlooked that needs to be done? Anything the Board Members on the phone call today need from either NIOSH or SC&A to help you with your thought process on this?

MEMBER CLAWSON: This is Brad. Not at

this time, Josie.

CHAIR BEACH: And, Jim?

DR. NETON: Same for me. Same for me, Josie.

CHAIR BEACH: Ted, I am going to turn it back over to you. I think we are done for today unless --

MR. KATZ: Yes, I think we can adjourn and after the discussion at the Board meeting we can figure out what is a -- and I think the DCAS folks will have to look into what kind of timeframe they are working on and then you can look into scheduling Work Group meetings as may be needed.

CHAIR BEACH: Okay. And can we get the transcript for this as soon as it's available, also, or --

MR. KATZ: Yes. There is no way that's going to happen before the Board meeting, for example, or what have you.

CHAIR BEACH: No. Yes, I know.

MR. KATZ: But, yes, it should be ready in a reasonable time. This wasn't a very

long meeting, so it shouldn't take that long.

Adjourn

CHAIR BEACH: Okay. Everyone, thank you for your attendance and your work. We'll see you next week.

(Whereupon, the above-entitled matter went off the record at 12:43 p.m.)