DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Los Alamos National Laboratory Public Hearing

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RICHARD KACICH
MICHAEL THOMPSON

SANTA FE, NEW MEXICO; WEDNESDAY, JUNE 7, 2017

5:00 P.M.

CHAIRMAN SULLIVAN: All right. Good evening. My name is Sean Sullivan. I'm the chairman of the Defense Nuclear Facilities Safety Board. I will preside over tonight's public hearing. I'd like to introduce my colleagues on the Board. To my immediate right is Board Vice Chairman Bruce Hamilton, and to his right is Board Member Dan Santos. To my left is Board Member Joyce Connery. Board Member Jessie Roberson was unable to be with us today. We five constitute the Board.

The Board's General Counsel, Mr. James Biggins, is seated to my far left, and to my far right is Mr. Timothy Dwyer of the Board's technical staff. The purpose of this hearing is to gather information regarding the National Nuclear Security Administration's strategy to ensure the hazard to the public and workers posed by the storage and processing of special nuclear materials within the Los Alamos Plutonium Facility is safely managed now and into the future.

The Plutonium Facility at LANL houses unique and critical plutonium processing capabilities that are essential to the continued

assurance of the nation's nuclear stockpile as well as supporting programmatic work for the Department of Energy Office of Science and the National Aeronautics and Space Administration, among others. The Plutonium Facility has been in operation since 1978, and many of its original safety systems are still relied upon to ensure operations can be safely accomplished. Additionally, over the years the plutonium inventory within the facility has not been aggressively managed to minimize its accumulation. NNSA depends on these two things -- limiting the inventory of special nuclear material and ensuring the safety systems perform reliably -- to ensure adequate protection of the public and the workers.

During this hearing the Board will receive testimony on the current and future mission needs and vision for the Plutonium Facility. Now, let me be clear. The Board does not manage the missions. The Board advises the Secretary of Energy on safety risks and measures that affect the adequate protection of the public. To the extent that we ask about future missions, we do so with the understanding that mission needs drive the minimum necessary facility plutonium inventory; and inventory, in turn, defines the risks and measures

needed to control those risks. Future mission needs will also help dictate how long the Plutonium Facility will need to remain in operation as the facility and its systems continue to age.

Regarding nuclear material inventory within the facility, in September of 2015 the Board issued our Technical Report 39 entitled "Opportunities for Risk Reduction at the Los Alamos National Laboratory Plutonium Facility Through the Minimization of Material-at-Risk." "Material-at-risk" is a DOE term for a subset of the nuclear material inventory. The Board is interested in hearing any actions NNSA has taken in response to this report, as well as any other efforts to reduce the amount of nuclear material within the facility. We seek to understand impediments to removing unneeded materials from the facility as well as NNSA's plans for managing future inventory needs as missions evolve. Many of the facility safety systems relied upon to protect the public are of the original vintage. They do not employ modern technology and have been prone to failure. As with any aging facility, it is likely that replacement of or significant upgrades to systems will be necessary to ensure that they can reliably perform the

required functions well into the future. So the personnel have identified known deficiencies with these safety systems that they are working to resolve, but many are deferred to future years; and funding, as it always is, remains subject to annual congressional appropriations. We desire to hear the NNSA's strategy for ensuring the plutonium facilities can continue to provide adequate protection for the public and workers as the missions continue into the future. We would also like to understand the plan for making necessary upgrades and resolving identified deficiencies as well as assessment of the adequacy of measures put in place to compensate for these deficiencies while improvements are being made. Therefore, the public hearing will focus on four main areas: No. 1, risks associated with current and future Plutonium Facility inventory levels; No. 2, actions taken by NNSA and LANL to address opportunities identified by the board to minimize material-at-risk; No. 3, actions to reduce facility risk for long-term operations; and 4, the adequacy and status of safety systems to support current and long-term operations.

Tonight's order of business will include a statement from our technical staff and testimony

from two panels. The first panel includes Mr. James McConnell, the NNSA Associate Administrator for Safety Infrastructure and Operations; Dr. Craig Leasure, LANL's principal associate director for operations and business; Ms. Kimberly Davis Lebak, the NNSA field office manager at Los Alamos; and Mr. Ted Wyka, the Los Alamos NNSA field office acting assistant manager for operations. The second panel will include, again, Mr. McConnell; Mr. Rick Kacich, LANL's deputy director; again, Ms. Kimberly Davis Lebak; and Mr. Michael Thompson, the NNSA Assistant Deputy Administrator for major modernization programs.

In order to ensure accurate and timely information, this hearing is being recorded through a verbatim transcript, video recording, and live video streaming. The transcript, associated documents, public notice, and video recording will be available for viewing in our public reading room in Washington, D.C.; and, in addition, an archived copy of the video recording will be available through our website for at least 60 days.

We will welcome comments from interested members of the public at approximately 8:30 p.m. A list of those speakers who have contacted us in

advance is posted at the entrance to this room, and we have generally listed speakers in the order in which they have contacted us or, if possible, when they wished to speak. I will call the speakers in this order and ask the speakers to state their name and organization, if any, at the beginning of the present -- their presentation. There's also a table at the entrance to this room with a signup sheet for members of the public who wish to provide comment but did not have an opportunity to notify us ahead of time. They will follow those who have already registered with us in the order in which they have signed up. We reserve the right to further schedule and regulate the course of any hearing, to recess, reconvene, postpone, or adjourn any proceeding, and to otherwise exercise its authority under the Atomic Energy Act of 1954 as amended.

This concludes my opening remarks, and I will now turn to my fellow board members for their opening remarks.

Mr. Hamilton.

MR. HAMILTON: Thank you, Mr. Chairman. I have no opening remarks.

CHAIRMAN SULLIVAN: Okay.

Mr. Santos.

MR. SANTOS: Thank you, Mr. Chairman. No opening remarks.

CHAIRMAN SULLIVAN: Ms. Connery.

MS. CONNERY: Thank you, Mr. Chairman. Also no opening remarks.

CHAIRMAN SULLIVAN: Okay. That was fast. This concludes the Board's opening remarks. We now have the opening statement from the DNFSB staff. Speaking for the staff is Mr. Timothy Dwyer, the DNFSB lead for nuclear weapons programs.

Mr. Dwyer.

MR. DWYER: Thank you, Mr. Chairman and Board members.

I appreciate this opportunity to outline our understanding of the safety posture of the Plutonium Facility at LANL. The purpose of my statement tonight is to provide background information in order to assist the public in understanding tonight's proceedings. A handout listing acronyms and definitions, and another describing the effects of radiation, as used in my remarks, are labeled Exhibits 1 and 2 and are available at the entrance to this conference room.

The Plutonium Facility is a Hazard Category 2 nuclear facility that began operation in

1978. The facility plays a crucial role in the processing of plutonium for the Department of Energy, or DOE. The National Nuclear Security Administration, or NNSA, relies on the Plutonium Facility to support its missions focused on nuclear stockpile stewardship, nuclear material management, and plutonium sustainment. In the case of the Plutonium Facility, the approved safety basis limits the amount of material-at-risk on the first floor of the facility to 1.8 metric tons of plutonium 239 equivalent curies.

According to the accident analysis described in the safety basis, the bounding accident scenario involving this material is a severe earthquake that causes multiple fires inside the facility and results in significant radiological dose consequences to the public. The estimated number exceeds the DOE evaluation - guideline 25 rem total effective dose. Due to these postulated consequences, DOE directives require the use of safety class controls to ensure that the public is adequately protected.

As a general rule, NNSA has two courses of action they can pursue, either alone or in combination, to improve the safety posture and

reduce the risk at the Plutonium Facility. One involves reducing the quantity of material-at-risk in the facility. The other involves the implementation of different or additional safety systems.

First I would like to discuss reducing risk by reducing the amount of material-at-risk. This course of action is based upon the principle that radiological dose consequences are a function of the amount and form of radiological material available to be released. The more radiological material housed in a facility that can be impacted by an accident, the greater the potential consequences to the public from the accident. In fact, DOE directives state that minimizing the hazardous material inventory should be the first priority when establishing the facility's control strategy. Ideally, the nuclear material inventory should be maintained at the minimum level necessary to support mission requirements. At the Plutonium Facility this might be construed as requiring, for example, the minimization of excess material or No Defined Use material. I should note that DOE uses the term "defined use" for material identified as supporting mission requirements or being held for

future programmatic use. Any material not actively being used or not being held for future programmatic use is categorized as no-defined-use material.

The Board addressed this principle in Technical Report 39, as mentioned by the chairman. In this technical report, which is available on the Board's website, the Board identified several opportunities to reduce risk at the Plutonium Facility, including accelerating the execution of the Material Recycle and Recovery program, reducing residence time of materials on the first floor that haven't been used in recent programmatic activities, and increasing the utilization of certified storage containers. To date, NNSA has made improvements in response to Technical Report 39. NNSA reduced material-at-risk by moving some material to more robust locations, improved records, increased the use of approved certified containers, which limit the amount of material that can be released during an accident. Further, NNSA took action to understand which containers currently in use could be credited to mitigate the release of material during an accident.

Despite these accomplishments, NNSA still faces a number of impediments to the reduction of

material-at-risk. Specifically, some of the nuclear material in the Plutonium Facility that is categorized as no-defined-use is destined to be dispositioned as transuranic waste. However, much uncertainty still exists regarding the near-term rates of waste disposal at the Waste Isolation Pilot Plant as it resumes operation. The new Transuranic Waste Facility at LANL is in the process of starting operations but won't be able to accept the majority of the transuranic waste currently stored in the Plutonium Facility. Operations in the Plutonium Facility are also still recovering from the 2013 conduct of operations and nuclear criticality safety issues.

I now turn to the second method for improving the safety posture of the Plutonium Facility, the implementation of the different or additional pedigreed safety systems. DOE nuclear facilities rely on engineered features to prevent accidents and mitigate radioactive or hazardous material exposure to the public. DOE directives detail a process for developing an appropriate control strategy, including identifying all hazards, understanding the risks to the public due to these hazards, and selecting engineered and administrative

controls to minimize the risk. For the myriad of potential accidents that could occur at the Plutonium Facility, NNSA relies on several safety class controls including: The structure of the facility to limit the release of radiological material - called passive confinement; the fire suppression system to limit the size, temperature, and duration of fires; and components of glove boxes to mitigate radiological releases from glove boxes. The safety basis for the Plutonium Facility also identifies deficiencies in these safety systems that may prevent them from performing their intended function during an accident. To address these deficiencies, the safety basis identifies compensatory measures for the short-term and planned improvements to restore the systems full functionality for the long term. In addition to the identified deficiencies as noted by the chairman, many of the safety systems in the Plutonium Facility date from the 1970s and contain original components. These safety systems are nearing the end of life, are suffering from decreased reliability and require replacement parts that may no longer be manufactured. For example, over the past year one of the two diesel fire water pumps has failed

multiple times resulting in the inability of the Plutonium Facility to support full operations. This has impacted several programs and initiatives including the ability to perform risk reduction activities. At present the Board's staff is reviewing the current plutonium safety basis and control set. The Board's staff has also been following closely many of the concerns highlighted in my remarks as well as the actions NNSA has taken to address them.

Subject to any questions from the Board, this concludes my statement.

CHAIRMAN SULLIVAN: Thank you, Mr. Dwyer. I actually do have one question for clarification.

You state -- when you said that the bounding accidents in Area O, which is the earthquake, shows that postulated exposures to the public are above the DOE evaluation guideline which requires safety class controls. I just want to -- for clarity, the laboratory's safety analysis of the effective of those controls that NNSA has approved does, in fact, show that the public exposures have been brought down to below the evaluation guideline; is that correct?

MR. DWYER: That is correct. The above

the evaluation guideline value is the unmitigated accident. With the controls in place, the approved safety basis currently states that the value is below the evaluation guideline.

CHAIRMAN SULLIVAN: Okay. Thank you for that clarification.

Any other Board members have any questions for Mr. Dwyer?

At this time I would like to continue the hearing by inviting the first panel of witnesses to the witness stand. If you would come up, again, for the public we are having here before us Mr. James McConnell, the associate administrator for safety infrastructure and operations for the National Nuclear Security Administration; Dr. Craig Leasure, principal associate director for operations in business for the Los Alamos National Laboratory; Ms. Kimberly Davis Lebak, the Los Alamos field office manager for the National Nuclear Security Administration; and Mr. Ted Wyka, the Los Alamos field office acting assistant manager for operations for the National Nuclear Security Administration.

Welcome. Good evening. And thank you very much for taking the time to appear before us today. We've set aside time for opening statements

by the panelists and understand we will have a statement from Ms. Lebak, and then she will be followed by a statement by Mr. O'Connell.

Ms. Lebak.

MS. LEBAK: Thank you. Thank you, Mr. Chairman, members of the Board. I appreciate the opportunity to be here this evening to discuss the safety improvement and risk reduction in the Plutonium Facility at the Los Alamos National Laboratory. I will address actions that the NNSA has already taken or is planning to take to address reduction in the plutonium inventories associated with nuclear material-at-risk, or MAR, as well as initiatives to improve safety and worker protection.

PF-4 provides multidisciplinary activities essential for defense programs, nuclear stockpile stewardship, plutonium-238 heat source fabrication for space power supplies, nonproliferation, special nuclear material storage, and nuclear material disposition.

The facility has operated for over 38 years. NNSA and LANL management have made substantial safety upgrades to the facility and implemented strategies to reduce public consequences and enhance protection in the event of a natural

disaster, the most significant of which is an earthquake that has a probability of occurrence once in 10,000 years. The postulated accident that has affected the most substantive improvements is a large-scale seismically induced fire on the main processing floor in PF-4, which could be caused by a significant seismic event.

It is important to note that facility and operational improvements have resulted in a reduction of more than 60 percent of the MAR in LANL's PF-4 since 2009. MAR reduction within PF-4 has been achieved using multiple concurrent strategies including the shipment of radiological nuclear material offsite, disposing of legacy plutonium residues, storage of plutonium materials in robust certified containers and storage of nuclear material in multiple means such as containers, a vault, and fire-rated containers.

In 2015 the Defense Nuclear Facility Safety Board issued a tech report, TECH-39, that summarizes further opportunities to reduce the MAR in PF-4. Recent progress has focused on inventories located on the PF-4 main operating area, prioritizing nuclear material located outside of gloveboxes in containers in storage and high MAR

locations inside of gloveboxes.

MAR reduction activities at LANL require careful consideration and planning. Since packaging legacy plutonium inventories in more robust containers can generate a radiation dose to a plutonium worker, the pace of MAR reduction is influenced by our implementation of the ALARA principle, to keep radiation exposure as low as reasonably achievable. Further progress in MAR reduction has been impacted by both the limited ability to generate and dispose of transuranic waste due to the current unavailability of Area G onsite and the Waste Isolation Pilot Plan over the last three years, and the fact that our new Transuranic Waste Facility is no longer in service, and ongoing efforts to resume all operations in PF-4 following an operational pause that was declared in 2013.

Although MAR varies with the programmatic workload, TA-55 is required to remain below the MAR limits described in the documented safety analysis. These limits ensure safety, but minimizing MAR is a prudent objective to minimizing risk exposure. The considerations for reducing MAR are both related to the existing inventory and to potential future missions. For example, Los Alamos has been directed

by Congress to establish the capability to make up to 30 War Reserve pits per year by the year 2026, and be able to demonstrate a capability of up to 80 pits per year around the year 2030.

While such a large increase in pit production will necessarily result in a net increase in MAR at PF-4, NNSA and LANL are working to minimize the impact of such an increase. In the longer term, modular additions to PF-4 have been proposed by Los Alamos as a means to reduce the operational risk profile and expand programmatic operations with several different configurations and are being evaluated as part of an analysis of alternatives.

I would like to talk for a moment now about NNSA's strategy to ensure the efficacy of the PF-4's safety structures, systems, and components for current and future mission needs at LANL. We are making headway in addressing operational and infrastructure challenges in the Plutonium Facility. Earlier this year the Defense Nuclear Facility Safety Board closed Recommendation 2009-2, LANL Plutonium Facility Seismic Safety, as the DOE has made, and continues to make, upgrades to improve PF-4's ability to withstand the evaluation-basis

seismic hazard.

Analysis from NNSA and LANL shows that the facility was safe prior to the DNFSB Recommendation and upgrades. For example, the seismic hazards analysis in the approved documented safety analysis showed that the deflection of the roof of the PF-4 during a design basis earthquake and the building remained in a safe condition. There were components within the building that needed strengthening and that work was completed -- as a priority -- in 13 months, and each year additional components have been strengthened. NNSA and LANL maintain the safety basis for PF-4 with appropriate controls, to assure adequate protection of the public, workers, and the environment.

As a result of the Board's Recommendation 2009-2, we made a number of additional seismic improvements to the facility. The facility's ability to withstand a postulated seismic event now exceeds DOE's requirements for existing buildings.

The Board indicated in its January 3, 2017, letter closing Recommendation 2009-2 that question remained regarding the suitability of PF-4 for long-term operations. NNSA recognizes the need to look ahead and maintain safe operations to ensure

reasonable assurance of adequate protection for the worker, public, and environment. NNSA has overseen more than 90 seismic upgrades to structural components and safety systems. Each of these upgrades enhances the overall safety posture of the facility. The current safety basis reflects a complete analysis of all operations that could be affected by the seismic event.

I would also observe that the PF-4 ventilation system is robust, reliable, and has redundancy; however, it is aging. As part of the overall strategy to make safety improvements at PF-4 we have completed several projects that enhance the operability of the ventilation system. These projects are documented in the TA-55 project execution strategy from December 2016. They include structural upgrades, anchorage of electrical equipment to meet higher seismic loads, and anchorage of ductwork to meet these seismic loads. All of the fiscal year 17 scope identified in the project execution strategy is funded and being executed. NNSA continues to work improvements as recapitalization modifications.

So in summary, we continue to make design, operating, and facility improvements to maintain the

nation's only operational Plutonium Facility of this kind. Since 2009 there has been a 60 percent MAR reduction in the facility. Current operational restrictions exist which limit the amount of material in various operations performed in the facility. An approximate $95 million recapitalization project will conclude in 2018, and we have invested approximately $5 to $15 million a year since 2011 in building and structural seismic upgrades. So this is just a subset of some of the other initiatives my colleagues from Washington will describe. So thank you for the opportunity to be here tonight, and I look forward to answering any questions you may have at the appropriate time.

CHAIRMAN SULLIVAN: Thank you, Ms. Lebak.

Mr. McConnell.

MR. McCONNELL: Thank you, Mr. Chairman, members of the Board. The safety and security of the workforce, our facilities and the public remain our top priority. I appreciate the opportunity to come here tonight and talk with you about the actions we're taking to improve safety. I'll speak briefly about the headquarters element actions the National Nuclear Security Administration is taking to address risk reduction at the Plutonium Facility

at Los Alamos, and with your permission I'll submit my full testimony for the record.

CHAIRMAN SULLIVAN: Certainly. We'll accept your testimony.

MR. McCONNELL: During the last several years we've taken numerous actions to improve the facility's structural performance and we continue to focus on this important area. We've analyzed the facility for the very significant earthquake Ms. Lebak talked about with a return frequency of once in 10,000 years. We've concluded that the facility will survive that earthquake and will protect the hazardous material. However, the design of the facility, driven by the building codes that were in place at the time of construction, result in a relatively small margin to failure in that kind of an event. We've been making structural improvements to increase this margin. For example, we've added a drag strut to the roof of the facility and we are currently actively wrapping columns and roof girders with carbon-reinforced plastic. At the same time we're continuing with ever more sophisticated analysis of key elements of the facility where the margin of safety may be smallest. We're currently working towards a nonlinear dynamic analysis of the

building's behavior in response to a seismic event. This analysis is in addition to a linear dynamic analysis and a static nonlinear analysis, which have already been completed. The purpose of the additional analysis is to use the most advanced methods to ensure key elements of the facility, such as the behavior of the column capitals, are well understood. While we anticipate that the additional analysis will confirm the appropriateness of recent seismic upgrades, it may also highlight the needs for additional upgrades to the facility.

In addition to the work focused on structural analysis and improvements, NNSA has several major construction projects underway or planned to improve the safety and capabilities of PF-4, the Plutonium Facility, as well as the safety of overall plutonium operations at Los Alamos. These major projects include the TA-3 substation replacement project, the TA-55 reinvestment projects, parts 2 and 3, the radioactive liquid waste treatment facility, the transuranic liquid waste treatment facility, the Transuranic Waste Facility, which is a solid waste facility, and the chemistry and metallurgy research replacement project. Combined, these projects represent an

investment of approximately $3 billion to improve the reliability and safety of plutonium operations at Los Alamos. In addition, over the last four years NNSA has invested approximately $350 million in maintenance and smaller projects at Los Alamos to improve safety and infrastructure. NNSA is planning to spend an additional $95 million in the coming year. Examples of these smaller projects include such things as criticality safety infrastructure upgrades, ventilation and confinement system upgrades, fire water loop component replacement, and firewall upgrades.

In addition to the direct infrastructure improvements, we at headquarters are also helping with the safety basis improvement progress. We have provided subject matter experts and personnel with significant experience in the review of accident analysis to support the field office in this area. There have been a number of upgrades and changes to the facility safety basis that are being pursued in direct regard to the infrastructure work that is underway. The headquarters support has enabled the field office to improve its focus on local oversight priorities.

Overall, thank you very much for the

opportunity to address these matters. We share the commitment to executing vital national security missions safely. We understand the significance of the Plutonium Facility and the current planning for stockpile stewardship and we're committed to ensuring the robust capability remains safe and viable as long as the Plutonium Facility is required to complete that mission. Thank you very much.

CHAIRMAN SULLIVAN: Thank you, Mr. McConnell, and if any other analysts have written testimony, we'll certainly be willing to accept that.

At this time the Board members will ask questions of the panel members. The questions will generally be directed at one of the panelists, but any other panelist may seek their permission to either respond in place of the panel member that was called upon or to supplement the answer given by the panel member that was called upon.

And so at this time I'd like to start by asking a question of Mr. McConnell. I'd simply like to ask for purposes of the public that's here if you could expound a little bit on some of the missions that Ms. Lebak mentioned, several of the missions that are performed in the building. If you could

expound on some of the programs that are conducted inside the Plutonium Facility and how any of these might change, as with the plutonium strategies, as you've discussed.

MR. McCONNELL: Thank you. An excellent question.

First off, as you heard, the Plutonium Facility supports a wide number of missions but not all those missions have the same amount of impact or same amount of space or material-at-risk. So I would say there are four main missions, main programs, that are supported by the Plutonium Facility, the first of which is the pit production mission. It's just starting to ramp up. That is the activity required to make plutonium pits in accordance with direction from the Nuclear Weapons Council or the national strategy. The second program is to do surveillance of existing pits. The surveillance is an activity in which we do quality checks of the pits that have previously been made either at Los Alamos or at Rocky Flats, to ensure that those pits still remain adequate and appropriate for our use in the stockpile.

The third major program is the ARIES program, which is part of the nonproliferation

effort overall to process surplus pits to a material form that can be used for subsequent activities.

The fourth major program that I would highlight is what we call MR&R, material recycling and recovery. It's the program that takes the material that is produced during the other production work at Los Alamos at PF-4 and processes it into a state where we can either recover the material to be put back into the system then for the other programs, or to render the material into a safe and stable form, as it were, for example, to be just part of the waste. Again, there's a lot of mission space for NASA and for other customers and the facility is, you must remember, a research and development facility. But those are the four that primarily drive the work.

CHAIRMAN SULLIVAN: Thank you. So you mentioned pit production. Can you expound on what national direction NNSA actually does have with respect to pit production in the future?

MR. McCONNELL: Sure. So our pit production is actually defined for us both by Congress and then also through the Nuclear Weapons Council, which is a council comprised of senior officials from the Department of Defense and our

under secretary of the National Nuclear Security Administration. So between the congressional requirements and the military requirements, we have expectations to be able to make a certain number of pits by a certain date, and that number increases over time from 10 to 20 to 30 potentially to as many -- can you still hear -- as many as 80 pits potentially a year.

CHAIRMAN SULLIVAN: And the time frame you're talking about is sometime over the next decade; is that correct?

MR. McCONNELL: Or more. Between -- so over the next decade to get to those lower numbers, potentially to get to the very high numbers, end of 15 year.

CHAIRMAN SULLIVAN: And you mentioned the ARIES mission. Is that tied at all to the MOX facility which I understand -- I just -- is -- may or may not actually be completed?

MR. McCONNELL: Correct. So the ARIES is a -- it's a process. It takes surplus pits, renders them more chemically inert, in a more stable form that then we could use that material presumptively for mixed oxide fuel if that's what the international program demands, and if not, whatever

other position or storage expectations are provided to us to safely dispose of surplus pits, pits that are no longer required.

CHAIRMAN SULLIVAN: And does NNSA have a time frame for how long they could say that the Plutonium Facility will need to remain in operation?

MR. McCONNELL: Not right now. This is our single hazard category 2 security category 1 Plutonium Facility in the NNSA enterprise. There is no other facility in the enterprise with this capability, with this level of security and safety, and while we are currently in the middle of doing an analysis that -- we call it an analysis of alternatives -- to look at our plutonium system as a whole, the current Plutonium Facility, PF-4, has no defined end of life. Our -- until we come up with some explicit plan differently, we intend to continue to operate the PF-4.

CHAIRMAN SULLIVAN: Can you speak to any of the alternatives that you're analyzing?

MR. McCONNELL: The process for analysis of alternatives is to very openly, very comprehensively identify all of the potential solutions to a mission need. Our mission need is to sustain the nation's ability to manage and to --

manage plutonium and produce products, materials, out of plutonium potentially, specifically pits. So that's the mission need. And then we look at all the different ways that that mission need could be satisfied. It could be satisfied through the existing facilities here at Los Alamos. It could be satisfied by adding new facilities at Los Alamos, by having the mix of existing and new facilities at Los Alamos, or it could be satisfied by adding capabilities or leveraging existing capabilities elsewhere in the country at other sites where plutonium is already present or has been used.

And so all those options are explicitly part of our analysis of alternatives. It's premature right now to describe in more detail those individual options because that's the work of this team that's ongoing right now. We hope to have those results this summer, late this summer, to inform a more specific answer to what we intend to do in the near future.

CHAIRMAN SULLIVAN: All right. So it's safe to say an analysis is ongoing, but national leadership hasn't made any decisions yet. Would that be a true statement?

MR. McCONNELL: Right. This is the work

that informs the leadership to make those decisions.

CHAIRMAN SULLIVAN: All right. Thank you.

And are there any -- so you said -- you talked about the programs. You've talked about this being the only -- the nation's only hazard category 2 facility for doing plutonium programs. Do all of these programs require a hazard category 2 facility? Could any of them be moved to any of the other nonhazard --

MR. McCONNELL: The unique thing about the Plutonium Facility at Los Alamos is it's both category 2 and security category 1. The hazard categorization -- what does it mean? In our regulations we have essentially a four-tiered system for deciding how significant a facility is in terms of its material and its hazards. Hazard category 1 is generally reactors, large reactors. Hazard category 2 is the next level of risk or hazard. Hazard category 3 is below that. And then we have something that's called below hazard category 3, which is the fourth category.

Because the amount of plutonium that analytically drives a facility to be designated hazard category 2 is relatively low, many plutonium facilities are hazard category 2, but there's a wide

variety of work that can or can't be done. For example, the Plutonium Facility at Lawrence Livermore National Laboratory is hazard category 2 but it is not allowed to have the kinds of materials that -- because they do a higher security posture that is here at PF-4. So there are -- we even have some disposition sites that have hazard category 2 plutonium facilities.

The most useful opportunities are to find forms or types of work that we can do with plutonium parts such that the form and the containment of those parts preclude their being at risk in the accidents that we talked about, the material-at-risk. So if we can confine the plutonium into a very robust container, then we can put it into a lower hazard category facility, or even a facility that's below hazard category 3. We do that to the best of our ability, but the kinds of work that we need to do at the Plutonium Facility which involves things like casting of plutonium, melting and casting of plutonium or machining of plutonium doesn't avail itself to those kinds of controls and so that work would always need to be done in a hazard category 2 facility.

CHAIRMAN SULLIVAN: All right. Thank you.

Okay. I am done with my initial set of questions, and now I'm going to turn it over to Mr. Santos.

MR. SANTOS: Thank you, Mr. Chairman. According to the published hearing agenda, one of the objectives for this first session is to understand the current safety systems crediting the safety basis for the Plutonium Facility and their functions related to protection of the public and workers from hazards. In earlier statements we heard about kind of the bounding accident, but if I may ask, Mr. Wyka, could you please discuss the main hazards and accidents of concern at the Plutonium Facility?

MR. WYKA: Thank you, Mr. Santos. As Mr. McConnell mentioned just sort of as a little background, the Plutonium Facility, or PF-4, is a HazCat 2 nuclear facility. And again, this is based on the quantities of plutonium-23 and -239 that are stored and used in mission-related activities.

Also, before getting into some of the accidents, adding on to sort of the key PF-4 operations, that does include the nuclear material processing-related activities such as the pyrochemical, dissolutions, the separations, as well

as purification processes. It also includes material, nuclear material handling, movement, storage and transportation activities as well as nuclear forensics activities and waste management operations for both chemical and radiological materials, as well as it includes facility utilities and activities to support all the missions and operations or accident analysis bounds, all of those types of operations.

Now, PF-4 is a two-story facility, reinforced concrete structure, designed and constructed to remain functioning following a design basis that's a PC-3 type earthquake as well as a design basis PC-3 wind and tornado loads.

In this analysis, approximately 70 separate process hazard analyses and other hazard analyses were prepared to specifically identify and evaluate the range of operations and activities that are conducted at PF-4. The hazard analysis resulted in identification of really three broad hazard areas. One is nuclear hazards associated with the direct and indirect exposure to radioactive materials as a result of operations in PF-4. Also chemical and toxicological hazards associated with materials used in support of operations in PF-4.

And the third general area, or broad area, is really a nonindustrial and other hazards from energy sources associated with activities, processes, and operations at PF-4.

The general controls fall into three areas, and they provide defense in depth. One are the barriers. This is to uncontrolled hazardous material releases. The second controls preventive systems, to protect those barriers as well as systems to mitigate uncontrolled hazardous material release when the barriers fall, fail.

Now, the more serious accident scenarios probably fall into about five different areas. That's loss confinement events occurring from normal operations such as spills, container drops, and external and internal events, natural events. The second main category are probably the fires in a facility process operations and areas. This is from mechanical and electrical failures, emission of combustible materials, and external and natural events such as the seismic events resulting in a fire.

The next key category is over-pressurization in these conflagration events, such as exothermic reactions, steam explosions, or

heat-induced overpressure conditions. And then it's classification of criticality-related events in the facility process operations, as well as chemical releases including spills or releases resulting from process equipment failures.

Key bounding accidents -- major hazards and accidents at PF-4 primarily involve potential fires whether occurring due to initiators within the building or whether it's a consequence of seismic or other natural phenomenon hazards.

Seismic accident scenario in the 2015 DSA have been completely revised to deal with the first floor seismically induced fire scenario as well as to include some analysis or refinement of Soderstrom values. The latest update includes more effective consideration of the seismically upgraded fire suppression system, the seismic power shutoff switches, seismically upgraded glovebox support stands as well as a fire suppression system in the glovebox, and also effectively considered combustible loading controls, as well as the use of fire-related safes, MAR limit control as a mitigative SAC. For PF-4, the primary contributions to the safety control strategy for the seismically induced fire or some of the other key events is the

mitigative structure confinement which minimizes offsite dose in worst case accident to just below the evaluation guideline. With the addition the fire suppression system as a mitigative SSC, safety subsumed system and component, which further reduces this dose to about a third, and then upgrades to the ventilation system including fans and duct work, anchorage upgrades to the electrical distribution system and plain upgrades to the facility control system all contribute to further reduce the below-the-evaluation guideline. And for some more additional details, I'll turn it over to my colleague Dr. Leasure.

DR. LEASURE: Thank you, Ted. If you look at the numbers, what you would see for credited systems in the facility, we have 17 safety class systems. A simple example of that would be building confinement or the building structure itself. We have 38 safety-significant structure systems and components. Those are things not designated as safety class, but they provide preventive or mitigative function and they're a big contributor to our strategy, which is defense and depth, and those are determined from our safety analysis.

We also have five administrative controls.

Those are things where -- an administrative control is actually more effective than an engineered control. An example of that is limiting explosives in the facility.

And then finally, we have 16 safety management programs that support all of these other controls. Those are things like procedure training and qualification.

MR. SANTOS: As a follow-up question, so you mentioned that the structure, the confinement system, is one of the safety class system to mitigate some of the accidents in the Plutonium Facility by reducing the amount of radiological material released during an accident.

Can you explain a little bit of how the modeling of their radiological material release from PF-4 is done and what are some of the uncertainties associated with that modeling.

MR. WYKA: I'll start by at least discussing the structural confinement, because when you look at that, it's a cursory level that you're dealing with in terms of confinement. Look at the MAR and then around that you have the glovebox, glovebox ventilation, you know, the CAMs and fire detection all providing the first level with the

fire suppression system.

And then within the room you have the laboratory walls, the laboratory circulation system, as your sort of second level, that tertiary system. It's a quarter supply of basement exhaust, but out-of-confinement system, which is the structure itself, which includes as a safety class control the inlet and exhaust PIPPA plenums as well as ductwork. All contribute to that system. Probably not familiar with the modeling. I'm probably going to turn to Dr. Leasure for the modeling.

DR. LEASURE: So when you look at modeling for the confinement system, what we're generally talking about, I think you're looking for the design basis accident, large earthquake followed by fire in the facility.

So if you think about how we have to work our way through it, you start with going back to our probablistic seismic analysis, the latest version of that is 2009. What comes out of that analysis is a postulated set of ground motions from a large seismic event or large earthquake. Those ground motions in Los Alamos for PF-4 that we look at, we have both the horizontal and vertical component to those ground motions.

The very next thing one has to do is take a look at how those ground motions couple into the structure of the facility itself. PF-4 is a short, squatty structure. It is not very tall. It's two stories. A large part of it is underground. And so what we have to do is, using finite element analysis, essentially model how the ground motion affects the structure itself.

Finally, what we have to do is, we have to assume fires in the facility, in different locations in the facility. So for our documented safety analysis, what we've done is, we've looked at the activities in the facility and selected a bounding fire scenarios in the facility based upon the location of where those fires would be relative to outside doors and also based upon the amount of material that we would have in any one location.

From there, there is uncertainty associated with those fire scenarios because you'd have to make assumptions about the amount of heat that is generated, how long it takes for -- what one would consider to be a flashover event where you actually get a fire and it flashes over, because the main thing that we're trying to model is a force or a driver that would drive the nuclear material out

of the building which would then make it to where it may impact the public from wind direction.

One of the other uncertainties that we look at are door openings. So for example, we assume workers are in the building when that event happens. And what we train our workers to do is in a seismic event evacuate the building even if we believe the building is going to be safe, but we ask our workers to evacuate the building. They will go out outside doors and go to a muster area where we can account for people, but those doors may be open for a short period of time before they end up being closed. That's another part of the uncertainty in the calculation.

Given all of those conservative assumptions, we then draw the calculation that comes out and says, "Here is the potential amount of material that could be driven out, and based upon that, that then leads us to apply additional controls in the facility to do things such as containerizing materials in our plutonium-238 area," which we've done as part of that analysis.

MR. SANTOS: And for the material released itself, what sort of uncertainty is associated with that calculation?

DR. LEASURE: So for the material release, we follow a fairly standard process that's used in the business. It's a five-factor calculation. We look at what we call damage ratios or the amount of material that could get out of the container because the container is damaged. Leak path factor -- that's the open doors or cracks in the facility. So a leak path factor would be how much material could leak out of the facility as opposed to a perfectly structured facility would be zero.

We look at the source term. So the source term is really associated with the type of material, the material form, the material quantities, and then the drivers out.

And then finally we look at things we call Chi over Q, or different types of -- once the material is out, how it might propagate through the air, how much is dispersed, how much might deposit out nearby the facility and not be in a plume that would go offsite.

So we go through all of those processes. There's uncertainties associated with those. We use conservative assumptions in each of those steps which then leads to a conservative assessment of what the offsite dose consequence might be, and then

that is what we use to drive as we think about what controls we have in place, how we manage those controls, how we make sure they're operable, and then as we work with NNSA on those things that we might propose going forward as far as improvements or as far as maintenance and recapitalization for those systems that we need to make sure that those assumptions are valid.

MR. SANTOS: So the numbers that were mentioned earlier that are just below the evaluation guidelines already account all the uncertainties and they're conservative in nature.

DR. LEASURE: Very conservative.

MS. LEBAK: So if I might add, we referred to in our opening statement the documented safety analysis. So this is an analysis that the lab and NNSA are required to do. As Dr. Leasure said, there's several conservatisms in the analysis, and then the one incident that we -- that exceeded the DOE guidelines was the post seismic fire. And so we've been able to select a control set that we feel gets us into a regime that's below the DOE evaluation guidelines. Some of these other hazards and accident analysis activities that we've done are below the DOE guidelines. And so when DOE or NNSA

goes to approve the analysis, we're looking for that safe operating envelope to approve. The Laboratory proposes the analysis to us. We do have review teams that go through the calculations and a lot of the scenarios, and then ultimately we decide whether to approve the safe operating envelope.

And then as the Laboratory proceeds in their day-to-day operations, any changes that they are looking to make in the facility, whether it's a test or procedure or some change in an existing process, they go back and review that activity against this documented safety analysis to make sure they are still operating within the approved realm. And in the event there is an activity that would not be within that approved realm, then we would go back and do additional analyses and see what effect that would have on our current operating envelope.

And then once a year the Lab is required to go back and look at all the things that happened during the year and submit an annual update to the document and safety analysis.

So we are able to look at this not only each year, but the Lab looks at it each time they propose to make a change in the facility.

MR. SANTOS: One last question to

Mr. McConnell.

Is PF-4 the only major HazCap 2 facility within NNSA that relies on passive confinement or the structure as part of a mitigating strategy for accidents?

MR. McCONNELL: No. Most of our facilities use the structure itself as a primary confinement boundary, virtually all that I can think of, particularly the ones that these very stout reinforced concrete facilities. Some of them, if they're more modern and were built under a different set of design criteria, might have some of these active systems that are also preditator (sic), that we've studied well enough to believe that they would survive the most rigorous possible accident. But pretty much all the facility structures are intended to withstand the design basis seismic event.

MR. SANTOS: But they also have active, you said?

MR. McCONNELL: Some of them.

MR. SANTOS: Is there another one that only has passive similar to PF-4?

MR. McCONNELL: I want to make sure we talk about PF-4 correctly. PF-4 has a series of design basis accidents that Dr. Leasure talked

about. So they're everything from this post seismic fire where you have to have -- you have to have what we call the mode of force, something that forces the material out of the facility. So the seismic event in itself doesn't force the material out of the facility. It has the potential to damage the facility. The fire then creates the thermal driver that might force material out. So you have to have both of those, and you can interrupt it in more than one way.

There are other design basis accidents that we analyze at PF-4 for which the active confinement ventilation system is our credited control. The intention we have to have is that we have all of the bounding accidents, classes of accidents, understood and that our analysis is reasonably conservative for each of those bounding analysis -- accidents, rather. What that means is that the sum of all of our conservatisms has to be greater than the sum of all of our uncertainties, so that we are sure that we've driven ourselves to a point where even if we are wrong in all the errors that we could be wrong in, we've done enough conservative analysis that we still have a reasonable expectation of an adequate control set.

That's what's Ms. Lebak approves when she signs it.

So there are a whole class of design basis accidents at PF-4 that don't involve this most significant earthquake. It's only in the case of the 10,000-year earthquake that we have to assume that it damages the active confinement ventilation system and so we can't credibly rely on it. But in other scenarios, if a fire were to break out without an earthquake, that wouldn't cause the active confinement ventilation system to fail. And since we design it to be highly reliable in every scenario, unfortunately, except for the most demanding earthquake, it's still available in those cases.

So we do have a passive confinement strategy that's the basis for this one design basis accident, because that's the place where we come up with a set of controls that we believe are robust enough, even given all of the uncertainties we have, to still show that mitigated, once you take all of those, we are below this number of, this dose consequence that we call the evaluation guideline. Thank you.

CHAIRMAN SULLIVAN: Mr. Hamilton.

MR. HAMILTON: Thank you, Dr. Leasure. I

particularly appreciated your discussion of the accident analysis and how that works. And I'd like to work with you on peeling off another layer of the onion and let's look at -- examine how the process is for addressing deficiencies in safety systems.

Specifically, the Plutonium Facility safety basis identifies some deficiencies in safety systems that are relied on to protect the public from potential hazards and accidents. Could you discuss, please, the process for determining the impact on safety when these deficiencies remain unaddressed, as well as the need for some compensatory measures.

DR. LEASURE: Thank you for the question. So yes, for deficiencies we follow a very standard process. Let me talk about how we find deficiencies. So in our documented safety analysis, which is around 1,900 pages of document, we have determined what systems need to be credited, whether those are design features or engineered controls or process controls.

We do system health reports. So we go evaluate those systems either quarterly, monthly, or yearly, depending upon what the system is. We have operability criteria. In other words, we evaluate

each of those systems against the operability to make sure that they're performing the function that was intended. Where we find deficiencies, sometimes those deficiencies are things like a diesel generator that may not start up the way it is supposed to, at which point we then go into following our technical safety requirements, our TSRs. We would follow, then, what's called limiting conditions of operation. That is very much an if-then kind of a process. If this, then you do that step.

So those are very detailed instructions, because what we don't want are folks trying to decide what to do when we find these. It's a very structured process.

So the limiting condition of operations process then leads to, in some cases we can accept a deficiency for a period of time, if there -- if it is part of a redundant system or if other things are in place, which we would go check. For example, fire is always something we pay close attention to. Combustible loading in the facility is a control that we maintain all the time. If we go into a limiting condition of operation, in some cases, the very first thing we ask our operators to do is go

check and revalidate that we're still within our combustible loading controls, the amount of things that could burn in the facility. It is very low on a daily basis. And so we would check that.

From there, then we would go to action statements. The action statement then would say within some period of time we would need to take some action, and inside that time, if the action was repair the diesel generator, we repair the diesel generator within that action period. Then we bring that diesel generator back to operation. We would verify that it's doing its job as performed, and we would then bring the facility back out of that limiting condition of operation.

MR. HAMILTON: Let me give you a specific example that we're aware of and see how this fits into that. The Plutonium Facility safety basis gloveboxes are required to remain standing during a moderate earthquake. That would be a performance category 2, is the technical term; right? But not all of the glovebox stands meet this criteria. So how do you ensure that you have an adequate compensatory -- set of compensatory measures while these deficiencies are unresolved?

DR. LEASURE: Thank you. So let's talk

about what we use gloveboxes for. We use gloveboxes to contain nuclear material. The example you're talking about is a -- what I would call a moderate earthquake. One of the things that we've done as we look at the gloveboxes and the glovebox support stands -- because that's really what we're talking about -- when you have ground motion, the concern is the glovebox might topple over if the glovebox support stand is not credited to meet that.

Again, what we're trying to stay away from is a fire base scenario spills. If we have a spill of a glovebox, we have defense in depth so we have, as Jim talked about, Mr. McConnell talked about, we have active confinement ventilation that functions during that period that protects the material and the confinement of the facility that keeps the material from getting out of the building. So the concern there would be more worker kind of a hazard.

For gloveboxes where we actually melt plutonium -- because one of the activities that we do in the Plutonium Facility is we melt plutonium much like one would do in a foundry, in any kind of industrial casting area, and we will -- we cast parts and things with molten plutonium.

We have gone into the facility. We've

evaluated which of those gloveboxes would have molten plutonium potentially during that moderate earthquake, and we have upgraded all of those gloveboxes to actually meet the higher-level earthquake or the very rare performance category 3 or 1-in-10,000-year earthquake.

So those gloveboxes have been upgraded. We've done that as part of our TA-55 reinvestment project phase 2. We just finished doing that in the last year. So those gloveboxes will not topple over, will not spill molten plutonium.

For the ones that we would be concerned that would not meet performance category 2, then we have, again, defense in depth. We limit combustibles because, again, we don't want a fire, we don't want something to feed a fire. We have containers in those gloveboxes, in some of those gloveboxes, to limit the amount of material. And so in that kind of event our documented safety analysis analyzes that accident scenario, and the worst case potential consequence is actually far below the evaluation guideline. But at the same time, we put systems in place, whether they're administrative controls, engineered controls, or design features, to provide that defense in depth to minimize that

kind of consequence.

MR. HAMILTON: No further questions.

MR. McCONNELL: If I can add to that, though, every time we have an opportunity to strengthen one of those glovebox foundations, if we are putting in any new glovebox that we were to install from this point forward, regardless of the hazard of the activity in the glovebox, we install to the highest current standard, that performance category 3. So it's -- we constantly have an expectation that every time it is reasonably available to make the upgrade, for example, if we had to take out all the interference, all the things that are in the way for some other reason, then before we reinstall everything, we would upgrade the glovebox stance.

MR. HAMILTON: Thank you. I have no further questions, Mr. Chairman.

CHAIRMAN SULLIVAN: Mr. Santos, did you have a follow-up on this topic?

MR. SANTOS: A quick follow-up. How often is the safety basis document upgraded?

DR. LEASURE: I'm happy to --

MR. McCONNELL: Okay.

DR. LEASURE: So the Laboratory -- we do

what we call annual updates. So during the 12 months preceding the annual update, we daily evaluate -- whether it's a new operation, a new activity, or something that's changed, we go through something called an unreviewed safety question process, which is a very rigorous process to evaluate any change in the facility to see if there is any potential to impact any of the credited safety systems in the facility, and then we document that process. At the annual update or every year we will update that information into the documented safety analysis, which then may trigger some additional analysis, some hazard evaluation, accident analysis, and evaluate whether we need to update, change, or modify some controls. And we then provide that as a document to the NNSA field office. Kim's folks would then evaluate what we propose. Ultimately Kim is the risk acceptor, so she would have to agree with what we propose as changes.

MR. SANTOS: So when you're taking compensatory measures on, you know, deficiencies that may not have been resolved, how is that reconciled with the next update of a safety basis?

DR. LEASURE: So I think what you're

talking about is something called an evaluation of the safety of the situation. It's what we call a new information process. We go through and do an evaluation of new information or something we learn that there may be a deficiency or some factor that may affect a credited safety system. In that case, we evaluate what the potential impact is. We may recommend to the NNSA to put some compensatory measures in place. Those compensatory measures, we analyze how well they would work, how sustainable they would be, and then what we believe may be the long-term solutions to resolve the issue so that we don't need compensatory measures anymore. We then provide that information to the field office. They evaluate, and they direct back to us what we implement to meet that new information.

MR. SANTOS: Ms. --

MS. LEBAK: Yes. I agree with Dr. Leasure. And when we have compensatory measures in place, often it's not a simple fix that we can do immediately, because we place a significance on our safety and equipment and our -- keeping our operating envelope intact. We may need to go out and, you know, procure something. And these items, whether it's a piece of safety equipment or what

have you, they need to be pedigreed. They need to go through a particular procurement process, and it's typically not something that's going to be readily available. So oftentimes we will need to carry the comp measure. It could be resolved with operating dollars. It could be resolved within a period that's palatable to us in the Lab, or it could require a substantial investment and maybe go through what we call a line item project process, and that would be something over $5 million when we need to, you know, plan a line item project and get that through Congressional approval.

So in some of the cases we've talked about here today, we have this TA-55 reinvestment project phase 2 which has -- some of it's already complete. As Dr. Leasure mentioned, we've completed the glovebox stands. There was a criticality alarm panel that was part of that project that's been completed. And then we're working on uninterruptible power supply and stack monitoring and some of the other things before we close out that $97 million project in 2018. So it depends on the issue at hand on the compensatory measure, and it could be something we could fix readily. If not, then we need to go through a discipline process to

either work it out of operating dollars, or if it's more expensive, then try and get it into line item space.

MR. SANTOS: Thank you. No further questions.

CHAIRMAN SULLIVAN: Thank you. Ms. Connery has been waiting patiently to ask her question. Ms. Connery.

MS. CONNERY: Thank you. First of all, I appreciate the fact that you're all here today, and I appreciate the complicated nature of being able to deal with all of the functions that you have to do at TA-55 as well as being able to deal with all of these issues as they come up. So my question is a follow-on to what Mr. Hamilton and Mr. Santos were talking about, and it's directed at you, Ms. Lebak.

NNSA has to accept at certain points of time or is willing to accept safety system deficiencies for all of the reasons that you just enumerated, and I'm kind of interested in what is the process for doing that and is there is a formal process in which all of that is documented so that if you know you have to go and procure additional equipment, for instance, that this is all in a very comprehensive and well-documented form.

MS. LEBAK: Yes. We certainly document it in the DSA, in the documented safety analysis. So that's approved by the government, and it's the operating envelope document for the Laboratory. And so when they would go to propose their annual update for the following year, they would reconcile whether it's open or closed. And if it's open, it needs to be carried forward. And we have planned operational activities that we often reference in the documented safety analysis that can be a list of activities that we actually planned to do in the near future that could enhance some part of our operation.

So I would say it's definitely documented in the DSA and carried forward to the next rev. And it may -- you know, there could be a revision and then an annual update, but it's carried forward until such time it's closed or -- we may get additional information, some type of technical information that might preclude having the comp measure be a necessity.

So that's the -- that's kind of the beauty of the whole analysis process. It's not just one document that's done one time and we put it on a shelf. It's really a living process, and it can -- it's been going on for at least 2001 when the Code

of Federal Regulations came out with the nuclear safety rule. And prior to that, it was in DOE order space. So it does allow us to operate safely, and it allows us to document areas where we need to provide additional attention and we carry it forward.

MR. McCONNELL: If I might, could I add to that just a little bit? Our compensatory measures really -- there are lots of different ways to come up with compensatory measures, but there are two primary types. The first is an additional constraint on the hazard or the work. Since -- in a -- the classic one is if we have some analytical deficiency with our criticality safety analysis, the compensatory measure is that we don't allow work in the affected area that might result in a problem because we don't have the analysis at the level of pedigree we want. So that what we do is constrain the mission of the facility to be within whatever our currently accepted level of understanding is.

And so that compensatory measure can just continue. Now, we would like to eventually get to the -- and this follow-up on that -- to get to the better analysis so that we then have the utility of the facility back.

The other major kind of compensatory measure is the one that we seem to be talking about mostly here, which is when there is some deficiency. And the deficiencies are either the analytics or something isn't the way we would like it. And so the safety basis approval authority, the field office manager could write something called a condition of approval that says, "You're okay for a while, but between now and this next annual update you must complete these following intellectual tasks, analytical tasks." Or, "We don't like the actual physical facility. We want something physically upgraded." And so if it's a relatively simple upgrade, it could be done quickly. But some of these things can cost hundreds of millions of dollars.

And so we identify the fact that we have a need and a strategy going forward to physically improve the real property and the equipment, and then we keep track of that, and that helps. That's one of the things that helps drive our integrated priority list. If we only get so much money, what are the projects we're going to do and what are the projects we're not going to get to? If it's a safety-related project, it gets a very significant

boost in our prioritization scheme. But we still come, every now and then, to something we wanted to physically do this year didn't get done and so the annual update has to reassess the validity of the compensatory measure.

MS. CONNERY: I understand that. And I know there have been some deficiencies that have been around since 2007, so a significant amount of time, and they might get pushed down on the priority list. I guess the concern is, if everything then becomes a compensatory measure, those aren't designed to last into perpetuity, so what is the federal government's view, what is NNSA's view about when it becomes a point where you have to move away from that compensatory measure and address the deficiency and move it up the priority list?

MR. McCONNELL: I'll answer that because -- as someone who does that part of our work.

So all of our capital improvements, be they things that could be done at an operating expense level, or things that require minor construction or even major construction, go through an integrated priority list process. So we have the issues that need to be addressed at Los Alamos.

There are issues at all of the sites that need to be addressed also. So we take all of the projects that we would like to do. Some of them are because we have a safety issue we would like to resolve, and the most satisfying, the most appropriate way to resolve it is not to have compensatory measures, obviously, let alone rely on them for an extended amount of time, but actually fix things. It's better for safety, it's better for reliability, it's better for the mission, it's better for all regards.

There's also things that involve security. There's lots of other reasons that the mission demands us to do something in a couple years that we currently don't have the capability to do. All of those things have to get put into a list I can -- because I control the factors that go into that prioritization for real property and there is no criterion that outweighs safety. Safety is the -- so there's many different attributes. Are we going to save operating money? Are we -- sustainability. Are we going to reduce our green house gas emissions or our use of electricity or something? But there's no factor in that analysis that outweighs individually safety. It is the single largest factor.

MS. CONNERY: One final question for Dr. Leasure. During the session we focused on the Plutonium Facility safety basis and my understanding is that's actually not just one document but there's numerous pieces and parts to that. Multiple versions of the documented safety analysis and technical safety requirements, they're approved and implemented and perhaps create challenges for reviewing accident and hazards and implementation of safety controls.

Can you talk about briefly the configuration management of the safety basis and any efforts you're making to consolidate these versions into one combined safety basis?

DR. LEASURE: Thank you for the question. Let me make sure I understand what you mean by that.

There is one documented safety analysis. We may during a year propose page changes to the NNSA to address a specific element in the documented safety analysis. Those page changes -- I think that may be what you're asking about. What we generally do with page changes is in the following annual update, we incorporate those changes into the annual update so that we're not handling six different configurations of paper that say different controls

or different conditions.

And then for technical safety requirements, there is one set of technical safety requirements that is very well-documented. Again, what I talked about is surveillances that we do, operability that we do, and then the limiting conditions of operations, the if-then statements. So that gets updated every year so that we're not managing lots of different pieces of paper that we have to keep control of.

I will tell you during that year we have a very structured process on how we handle those kinds of changes during the year. We capture those. We keep a log. Our safety basis division within the Laboratory keeps track of that. We make sure that our operators that are cognizant system engineers also understand what has changed and what they are now operating to, to make sure that we are very well-aware of the operating envelope we're working to.

CHAIRMAN SULLIVAN: Mr. McConnell, we've talked a lot about deficiencies in safety systems and the projects that NNSA is funding in order to improve and address those deficiencies.

Specifically at one point NNSA was

planning, if I understand correctly, to upgrade the ventilation system to an active confinement ventilation system that would survive the design basis earthquake and currently NNSA is no longer planning to do that, if I understand correctly. Do I have that right?

MR. McCONNELL: Yes, sort of. We had a specific project, the TA-55 reinvestment project, phase 3, that we had preliminarily assigned a series of system improvements. And at the time we were -- conceptual design or conceptual part of this project had included a number of different safety improvements, one of which was the seismic enhancement of the active confinement ventilation system. As the project moved on to the more specific analysis of alternatives in choosing exactly what would be the final scope to go forward, there are several of these projects that were taken out of the TRP 3 scope, one of which is the seismic upgrade to the active confinement ventilation.

So the project that TRP 3 is going to go forward and do a set of safety improvements that will no longer include that. One of the things we do then is take that project. That one individual element, in and of itself, is potentially $200 to

$400 million. So it still exists as a mission need for PF-4 and -- the Plutonium Facility. But as we go through this analysis of alternatives of what we're going to do with the entire plutonium strategy and all the facilities that will have a role in plutonium work, we will reestablish what are the facilities and what are the physical projects that we're going to execute in order to ensure we have a safe, secure, and reliable plutonium capability.

It's -- again, as I said during the question of a little while ago, that process is being actively worked by professionals and experts over the course of the next several months to get to the point where they say, "Here is what we believe are the pros and cons of all the different options we could pursue and the actual final decision-makers will choose." And at that point we'll know whether or not PF-4, for example, is part of that strategy in such a way that we need to then schedule an upgrade to PF-4.

But it is not part of TRP 3 that doesn't mean we have decided that we will forego seismic upgrades to the Plutonium Facility. We just didn't include it in the scope of that specific project any longer.

CHAIRMAN SULLIVAN: Let me see if I can interpret what I think I heard you say.

So an active confinement ventilation system that would survive the design basis earthquake is still a mission need for the facility as the facility exists today. But based on the cost and perhaps other factors, you're choosing not to do it right now and will reevaluate based on other pieces and other alternatives that you referred to earlier for going forward with the mission. Did I get that right?

MR. McCONNELL: Yeah, I think you did.

So, you know, for example, if -- and this is completely -- there are a lot of different alternatives. There are a broad, very open-ended selection of what are all the different possibilities. So when you have that many possibilities, it really covers quite a diversity.

One of them might -- one of the options might involve not having very many hazardous plutonium operations continuing in the Plutonium Facility, in which case if we move the hazard to some other potentially even newly built robust facility that would be built to meet those criteria, it might lessen the need or the utility of doing an

expensive upgrade to the facility that now has a much lower hazard profile. It's far too early to know what that will be, but that is something that could conceivably come out of this analysis of alternatives, and then we would say that the resources are better spent building a new capability rather than back -- improving an older facility. It's just too soon to say.

CHAIRMAN SULLIVAN: Okay. Thank you.

Ms. Lebak, so another deficiency has to do with the fire water loop. So you spoke to upgrading the fire suppression system within TA-55. No matter how robust that fire suppression system is, it needs water to get to TA-55, and the water supply loop also supplies some other facilities at the lab which are not built to PC-3 seismic requirements. So if I understand correctly, there's a possibility in a design basis earthquake where a line might rupture somewhere else on the laboratory site which could jeopardize the ability to get enough water to TA-55.

So there -- again, there was -- my understanding -- a plan to perform some physical upgrades based on that scenario, and currently that that is not funded; is that correct?

MS. LEBAK: We have that scope that's been

considered for the TA-55 reinvestment project phase 3.

CHAIRMAN SULLIVAN: Okay. Which means that's not the phase we're talking about. That's at some point in the future?

MS. LEBAK: Right. So we're wrapping up phase 2 by 2018, and we're getting ready to embark upon phase 3 of -- the third phase of the reinvestment project.

DR. LEASURE: So if I could clarify a little bit to your question, the fire water loop that provides water to the Plutonium Facility, to PF-4, that loop inside TA-55 also supplies fire water to some buildings, mostly office buildings, inside TA-55. It's not the rest of the laboratory. We have two fire water tanks that are redundant that feed water into the facility. We have electric fire pumps, again redundant. We have diesel backup fire pumps, each to those two tanks. What we're talking about is if a building in a fairly large seismic event falls over and a water line breaks that would feed the fire suppression system to that building, which is perfectly good in other scenarios, our administrative control that we do today is, we have isolation valves to each of those facilities, and

after the earthquake that might cause those facilities to fail, we would go out and close those isolation valves, which would then allow the water to be directed into the Plutonium Facility at the levels and the speeds and the gallons per minute we need if there were a fire in the Plutonium Facility post seismic event.

What the fire water loop project would do -- and I had these a few years ago -- would be to bring in a different water supply -- that's one of the designs -- that would then be a separate water supply that would feed these nonnuclear facility buildings that might fall over in a large seismic event, so that we would better protect the redundant fire water system we have that would -- that again protects PF-4 and would control any fire inside PF-4 and mitigate any effect.

CHAIRMAN SULLIVAN: Is this -- Dr. Leasure, is this administrative control tested on a regular basis?

DR. LEASURE: Correct. Our operators are qualified to do that job, and we check to make sure that they know where the valves are, they know how to close the valves, and we make sure that we can do that in case that event happens.

CHAIRMAN SULLIVAN: You actually cycle the valves? The valves that aren't cycled for a long period of time tend not to work when you actually want to move them.

DR. LEASURE: I can go check, but I believe that's part of the operability determination. We make sure that those work. Yes, it would not be a very good thing to go up to a valve and find that it won't close when you need it to.

MS. LEBAK: But it's preferable to execute the third phase of the project.

DR. LEASURE: Correct. Correct.

CHAIRMAN SULLIVAN: If I could ask you, then, just to take, for the record, a question for the record to get back to us on the last time those were actually operated and how frequently they are supposed to be operated.

DR. LEASURE: Happy to.

CHAIRMAN SULLIVAN: Thank you.

Getting back to Mr. McConnell. We're talking about the design basis earthquake, and I understand this is a once-every-10,000-year event. Nevertheless, it is -- that's the Secretary's standard, is to design to that, and I believe that's

analogous to what the Nuclear Regulatory Commission requires of commercial nuclear facilities.

And I'll further point out that a lot of smart people still get fooled on occasion by Mother Nature, such as in Fukushima, where the event that occurred was more than what the design had -- design basis had anticipated.

So here we have a design basis accident scenario. We have an active confinement ventilation system that isn't assured of surviving that scenario. And as a submariner, if there's a fire, you know, rule 1 is put the fire out, but we're relying on an administrative control to make sure we have adequate water to PF-4 to actually do that.

So I guess what I'm talking about here is the regulatory requirement that the Secretary places here on the Laboratory in order to ensure the public is protected. Is it adequately met today? Does it rely on a promise that we will fix these things when we can? Do you understand my question?

MR. McCONNELL: I think I do. And I would say that it's our thought, opinion, that it is adequately protected today. That doesn't change the fact that we are constantly looking to improve both the reliability and the inherent safety of our

operations and that we value the increased reliability that would come from a dedicated fire water supply to this higher hazard facility. So it's still something we value and still something that we want to consider. Again, the potential for there being changes to the physical clutch in the facilities in and around PF-4 and in TA-55 is something that's being studied right now.

We believe that between the potential for the passive confinement ventilation system, which is the damper shutting once the door is closed, that the facility itself will not have paths out of it for material to be disbursed into the environment is a credible control. We believe that the fire suppression system is relatively robust, although it has weaknesses, and we've been discussing one of them. And we believe that the compensatory measure in the short term provides us with an adequate basis for assuring we have a control set that's reliable.

We very much want to continue to look forward to a better posture. There are -- there's more than one way to get to a better posture. A dedicated water supply is one of them, but we could come up with other solutions. And so right now part of our engineering and analytical work is to make

sure that we identify all the other solutions and then do a pros-and-cons analysis to say that the best thing for us to do to meet all of our expectations is either to go ahead with that through some other project that wouldn't be TRP 3 or to use some other capital improvement or some other way to get to the same level of improved assurance.

CHAIRMAN SULLIVAN: Okay. Thank you. I'll turn the questioning over to Mr. Hamilton.

MR. HAMILTON: Thank you, Mr. Chairman.

I'd like to change the tack here a little bit and talk about managing obsolescence, and I'll start with Dr. Leasure, if you would please.

The Plutonium Facility was approved for operation in 1978. Many of the systems still in use today are original components from that era. Which of the key facility systems are approaching the end of life expectancy and what processes do you have in place for combating obsolescence of these systems?

DR. LEASURE: Thank you for the question.

End of life is a very hard thing to define. What we do is -- again, remember that what we're talking about for facility systems, we rely on defense in depth. So we do the best we can with design features, engineered controls, and process

controls to have multiple sets of controls that interlock to provide that defense in depth.

What I will tell you is that in our documented safety analysis in the list of opportunities for improvements to the facility, we are looking at parts of the ventilation system that we could improve, including controls as well as physical parts of the facility.

A number of things are in the TA-55 reinvestment project, phase 2 and phase 3 process. So fire protection upgrades. One is to replace the fire detection system, which is old. It is -- I believe it's an '80s, 1980s vintage. That is the activity that, from the analysis of alternatives, likely will be the path forward for TRP 3, that project. That is a couple hundred million dollar activity. But we recommended that to NNSA because replacing that NFPA compliance, or National Fire Protection Association compliance, system is a pretty important thing to do. So I think we're tackling obsolescence there.

We are looking at replacing -- potentially replacing our diesel backup power sources at our fire water tanks with potential diesel electric generators that would then make the electrical pumps

work even without power to the facility.

We are looking at glovebox support stands, as Mr. McConnell talked about. Whenever we're replacing a glovebox and we have to pull the support stand back to do that, we will replace those support stands, some of which may be original to the facility, with upgraded, more highly reliable kinds of systems.

Our interruptible power supply system was original to the building. It is in the basement, it's hard to maintain, and so part of -- the last part of TRP 2, or TA-55 reinvestment project phase 2, is to upgrade the uninterruptible power supply which provides power to our operations center and some of our safety systems in the event of a loss of power so that we have -- that those work before the diesel generators kick on.

We're looking at upgrades to our paging system. We're looking at fire hazard analysis. We talked a lot about containers this morning. I suspect you will talk a lot about containers with panel 2. So we're upgrading containers as a way again to prevent or mitigate.

Our criticality alarm system was original to the facility from 1978. We've gone out and

procured a commercial system. We have just finished installing that, turning it on, and it is now in operation and we're talking out the criticality alarm system.

MR. HAMILTON: Let me interrupt you for just a second because one of the things that we've been looking at that I'd like you to address is the question of market availability for spare parts.

DR. LEASURE: Sure. So again, a lot of these systems, if they were built in the late 1970s, some of those companies could be out of business. We evaluate that. We procure alternatives. We are very good at designing alternatives to old systems. We go through a whole commercial grade dedication process. As you know, the nuclear supply or industry in this country is pretty limited, and so the ability to procure something that is already nuclear qualified is fairly difficult today, in today's environment.

So we have a process in place that we call commercial grade dedication. We will buy a piece of commercial equipment. We will develop a plan on either testing that equipment to make sure that it meets the environment that it has to perform in and does that robustly. We do engineering analyses to

make sure that structurally or whatever feature we're looking for, it will do the job. And then we go through a very rigorous process to qualify that equipment to go in to replace. So we are looking at a number of those factors as we're looking forward, and we've put most of that into our documented safety analysis to provide that information to NNSA to allow both Ms. Lebak and also Mr. McConnell to consider that in future upgrades for funding determinations going forward. It is a fairly complex system, and we look at all of those credited systems and a lot of the systems that we have to have that actually allow us to do the mission in the facility that may not be an accredited safety system or something we rely on, but if we can't do the mission in the facility because we have an original process air system or vacuum system that no longer works, that limits our ability to do the mission safely as well.

MR. HAMILTON: Okay. Thank you, Dr. Leasure. I have no further questions on this topic.

CHAIRMAN SULLIVAN: We have ten minutes left here in the first session. Then we're going to go to Mr. Santos and then Ms. Connery. So Mr. Santos, please make sure you leave her some

time. Thank you.

MR. SANTOS: Thank you, Mr. Chairman. I would like to follow up on Dr. Leasure and try to kind of -- both questions by Mr. Sullivan and Mr. Hamilton.

As was noted earlier over the past year, one of the two diesel fire water pumps has failed multiple times, resulting in the inability of the Plutonium Facility to support full operations. According to the Plutonium Facility technical safety requirements, as we put in our definitions, that the document that defines the envelope to safely operate, including the parameters for safety systems and structures and components, if one or both diesel fire water pumps are inoperable for a certain period of time, material-at-risk in the affected areas must be containerized within 50 days.

Could you explain a little bit about this technical specification requirement, and has the Laboratory demonstrated the ability to containerize all the material-at-risk within 50 days if the fire suppression system was inoperable?

DR. LEASURE: Thank you. Let me start with, again, talking about the configuration of the fire suppression system. We have two redundant fire

water tanks. Those two tanks are filled with enough water to run the fire suppression system in the facility for two hours. They are redundant. They each have -- each of those two tanks have electric fire pumps that are fed by redundant power that runs into the facility. So we have two lines of power that come in. We would need to lose both of those lines of power.

If we do lose those, each of those fire water tanks have diesel fire pumps that are operated by diesel if power goes off. Those are the ones that you're talking about.

We also have to make sure we have unimpeded water flow into the facility so that if a sprinkler head -- I suspect we have them in this building also -- if a sprinkler head goes off, that there's water to feed it.

We have as part of our technical safety requirements a set of limiting conditions of operation. I've talked about that before -- if-then statements. We have redundant fire suppression systems to ensure that if one is inoperable, the other one is. In a rare case where we might have two inoperable at the same time -- and I would say that's a very rare case, and I believe we haven't

seen that before where both have been out at the same time -- sort of the very last action we have of all the steps we take, I talked about looking at combustible loading in the facility and rechecking. We have folks that are trained and qualified to repair these systems. We have critical spare parts that we have in place. But if we go for a period of time where we have both of these systems out, we have planned for that.

The issue would be if the affected part of the facility is a portion of the facility -- for example, a room or a wing -- then we have in the limiting condition of operation 50 days, 50 calendar days -- that's a fairly long time -- to containerize MAR in that area. We might even move that material out of that affected area into another part of the facility or to another facility if we have to. We believe that is kind of a last-resort thing one would do. But what we want to do, because safety is very important to us, we don't want to have a system that we credit for safety inoperable.

We look at all the things that we can do to improve the safety posture of the facility even in this very low probability scenario where we might have two independent redundant safety systems that

may be inoperable at the same time.

Redundancy is a very important concept that we use for safety class systems in the facility, and so we work our way through that. I believe that in the last 30 years we have probably had things like a sprinkler head that has been inoperable for a period of time that led us to containerize material in that room or in that part of a room and potentially move it out of that area. So it is a possibility. It is essentially the 14th action step that we would take in that technical safety requirement out of 14 actions that we would go through leading up to that that would resolve the issue long before we have to take that action.

MR. McCONNELL: Could I add that we are actively working to replace that fire pump you just described? It's a project underway right now.

CHAIRMAN SULLIVAN: Thank you.

Ms. Connery, for our last planned question.

MS. CONNERY: The redundancy is important in safety, but perhaps not in questioning during the hearings, so I'll try not to be redundant. We talked about the material-at-risk reductions in the beginning. We talked about deficiencies in safety

system. I understand, as you mentioned, that you're undergoing appropriately this analysis of alternatives now, so we're in kind of a holding pattern until you make decisions based on that analysis.

Part of that analysis has to do with the reinvestment project and what steps you will take, you don't want to invest in things where money would be better spent on new facilities. So kind of as a wrap-up question to this session, I would like to know -- and perhaps this is to you, Mr. McConnell -- what is the thought process with regard to the plutonium modules and whether -- and what activities would move out of PF-4, if you can talk about that a little bit, and how that would help the safety systems. And then if the decision is taken not to move forward with those, what do you expect will have to be done to improve the safety system at PF-4 to be able to continue operations safely?

MR. McCONNELL: So for folks that -- when we use this phrase "modules," one of the things that's being considered amongst all of the diverse and somewhat creative opportunities to potentially solve our need is a thought that maybe the best thing to do is to build small, relatively

self-contained modules -- that isn't exactly how we use the term -- in which we could take key elements of the overall large PF-4 and move the equipment and the mission for that part of the overall process into a new facility of one kind or another nearby. And so I can describe some of the things that would make that attractive.

Now, there are a lot of things that go into it that will ultimately be our analysis. But the facility that we build today we build with the standards that we have today and with all the experience that we've gained about how to design and build facilities, particularly in the area of a seismically resilient facility that we didn't know in the '70s when we built PF-4. So we would build it from the ground up to be designed to the best of our knowledge right now.

There are certain operations in the Plutonium Facility that Dr. Leasure talked about with gloveboxes that one of the things we want to be really careful of is making sure that the form of the material or the type of material is -- adds more risk than some other activity or some other form of material. We could move the higher-risk things out and therefore make the overall risk of the facility,

whether or not we upgraded other systems, much lower; so that the attractiveness of that is that we have the potential to perhaps efficiently and effectively come up with a strategy to move higher-risk activities into more modern facilities and therefore change the overall risk profile of PF-4, which would then drive what upgrades to PF-4 we might ultimately choose to do.

So that in a nutshell is what makes this module option something that's certainly attractive and certainly worthy of a very serious consideration in this analysis of alternatives. I won't get into gory detail about any of the other alternatives or what might be some of the pros and cons, but that's certainly some of the pros to that.

And I want to -- one more thing before I get off the subject of TRP 3. Some of the projects that were originally going to be bundled into TRP 3 are relatively small, don't cost the tens or hundreds of millions of dollars. And so while it may not be part of the new TRP 3 line item construction project, they will go forward as either operationally implemented projects over the next year or two or minor construction projects that are already in our prioritization list for execution

this year or next year.

So while what scope is assigned to that one individual line item construction has changed, it doesn't necessarily mean that the projects that were at one point considered to be part of TRP 3 have been, quote, forgotten. They've been picked up in other techniques.

MS. CONNERY: Could you provide us perhaps a crosswalk of those things that were taken out of TRP 3 that will be invested in other ways?

MR. McCONNELL: I absolutely would be happy to do that.

CHAIRMAN SULLIVAN: Okay. Thank you. All right.

So at this time I'm going to thank all the panelists for appearing and giving us your time and all of your thoughtful answers. We're going to take a short recess and then we're going to come back with our second panel.

So this hearing is now in recess, and we will reconvene promptly at 7:15 p.m.

(Recess from 7:02 p.m. to 7:15 p.m.)

CHAIRMAN SULLIVAN: Okay. At this time I'd like to reconvene the hearing and continue by inviting our second panel of witnesses to please

come up to the witness table. This panel includes Mr. O'Connell, who was up on the first panel. It also includes Mr. Richard Kacich, the deputy director of the Los Alamos National Laboratory. Ms. Lebak will come back again. She is the manager the field office here in Los Alamos for NNSA. And Mr. Michael Thompson, who is the assistant deputy administrator for major modernization programs for the National Nuclear Security Administration.

And to Mr. Kacich and Mr. Thompson, who are both up here for the first time, I thank you very much for making yourselves available to us tonight.

If any of the panelists wish to submit a written statement for the record, we would certainly be happy to take that.

As was previously done in the first session, the Board will ask questions of the panel members, but any other panel member who would like to be recognized to either supplement an answer or to answer in place, you may certainly do that.

So at this time we will begin with a question from Mr. Hamilton.

MR. HAMILTON: Thank you, Mr. Chairman.

I'd like to address the topic of inventory

limits in Plutonium Facility, and we'll start with Mr. Kacich.

The Department of Energy's hierarchy at safety control states that the minimization of hazardous material is the first priority. The approved safety basis limit limits the quantity of nuclear material-at-risk on the first floor of PF-4 to 1.8 metric tons. That's 1,800 kilograms of plutonium-239 equivalent curies. But we know that many hundreds of kilograms have not been used or moved in the first floor for several years.

Based on the current programmatic needs, can you give me a sense of the lowest value that the inventory limit could be while continuing to meet the mission requirements?

MR. KACICH: I appreciate that question, Commissioner Hamilton. I don't think there's any particular opportunity for significant lowering of the limit as it exists today, and that is, in part, reflective of the uncertainties in the mission requirements and some of the other factors that govern it.

What I think is more relevant is the fact that notwithstanding whatever limit exists, the Laboratory is constantly looking for opportunities

to minimize the material that is actually at risk, not withstanding the fact that we might be 5 percent below the limit or 20 percent below the limit or any figure you want to throw out.

So the various activities that we have underway for some time and are continuing in terms of improved utilization of the vault in PF-4, improved use of containers that are both -- have a very low damage ratio or a minimum amount of material that could leave as well as ergonomically friendly to our operators and other methods that we've had undertaken for some time is what we will continue to do, and the lower we can make it and continue the execution, to execute the mission, that's what we'll do.

MR. HAMILTON: Okay. Thank you.

And just for the general public, I want to point out that when I say "on the first floor," I don't mean literally on the floor. I mean in containers or in components or units that are located on the first floor of the building.

So Ms. Lebak, given that there's got to be some difference between safety basis limit and actual inventory levels, can you tell us how NNSA validates the safety basis inventory limits and what

further reductions of the safety basis limit might be pursued?

MS. LEBAK: Okay. Thank you.

We've actually reduced the limits over time, and they've come down substantially over time. And we also look at operations on a case-by-case basis, and we can impose lower limits, if we so desire, for a certain type operation, and we do that.

The laboratory uses tracking systems in the facility to track material-at-risk or containers and other type of material flow throughout the facility. And we have the ability to conduct oversight at any time on any of the processes in the building, and we often do.

And so we have looked at some other tracking systems recently, and we've looked at it from a quality assurance standpoint. And although we found that overall, the systems are being used as they're intended to be used, I think in panel -- in session 1 we talked about some areas that we could possibly improve -- or in our previous discussions. For example, our database that the Lab uses, you know, could be expanded a little bit to put some more factors into the database, but we have had a

couple of issues that we brought to the Laboratory's attention, and they are working to correct some of the issues. But those came through some of the quality assurance oversight that we've conducted in the facility as a course of our normal -- the way we normally operate from a field office perspective.

So we actually have facility representatives in the facility. In the PF-4 facility we have three trained individuals right now that go through about 18 months of training. And then we also have subject matter experts who can do assessments or conduct oversight of the nuclear operations, and we have an assessment schedule. We schedule the work, and then we conduct the assessments, and we provide feedback to the laboratory. And so we have done that in the instance of the inventory tracking system, but it was not a deficiency that required an immediate action. It was a lower-level deficiency.

MR. HAMILTON: Okay. Thank you, Ms. Lebak, and thank you, Mr. Kacich.

No further questions, Mr. Chairman.

CHAIRMAN SULLIVAN: Okay. Mr. Thompson, welcome. As the assistant deputy administrator for major modernization programs, you have

responsibilities around the complex for NNSA. And at Y-12 there's been a concept that developed that refers to -- uses the phrase just-in-time material-at-risk --

MR. THOMPSON: That's right.

CHAIRMAN SULLIVAN: -- in order to try to minimize the material-at-risk that is in some aging facilities at Y-12. So if you could, if you could just briefly elaborate first on what that program is. And again, we're talking about the Y-12 site in Oak Ridge, Tennessee. But that's a lead-in, because then I'd like you to address whether that concept can translate to here at Los Alamos. And if elements of it can't, just explain why it might not.

MR. THOMPSON: Yes, sir. Thank you for the question.

To your point, Y-12 has been on the forefront of just-in-time inventory concepts and practices for their nuclear material inventory, which is primarily uranium, a different form than plutonium here at Los Alamos. They have over time had to deal with a number of aging facility issues much like we're talking about with PF-4, actually with facilities that are even more dated. And as a result of that, they have looked at creative ways

within the rules and regulations that we have to minimize how much inventory working needs to be dealt with on a daily basis and containerizing as much as possible, as was said in the first panel.

The first principle I think that some of those concepts that they have implemented for uranium can work for the plutonium arena here at Los Alamos. I think that one of the challenges is for us, as was stated in the first panel, we do expect in the future that our mission requirements will increase to levels of production for pits, in particular, that we have not seen before at PF-4. And because of that, I think there will be some -- there will be a gradual ramp-in in our production capability over the next decade or so. We have time -- but the good news is we have time to learn some of those lessons and apply them where they make sense to plutonium, so much so that only a few months ago we asked Los Alamos and Y-12 experts to form a joint body where they're actively exchanging ideas. We have a plutonium manager in headquarters and a uranium manager both working in my organization, and they have field office experts and subject matter experts from the laboratory and plant that are regularly meeting now to exchange some of

those early concepts and ideas so we can learn from each other essentially across the enterprise as to how to improve.

CHAIRMAN SULLIVAN: Thank you. So now at Y-12 they have a very new facility that's referred to by its acronym ATUMF --

MR. THOMPSON: That's right.

CHAIRMAN SULLIVAN: -- that allows for storage outside of the aging facilities.

MR. THOMPSON: Uh-huh.

CHAIRMAN SULLIVAN: And currently there is no such facility here at Los Alamos. Does any of that enter into any of the discussion, say, with the potential we heard earlier in the first panel about modules --

MR. THOMPSON: Sure.

CHAIRMAN SULLIVAN: -- and potentially moving things out of the PF-4 in the future?

MR. THOMPSON: Certainly.

CHAIRMAN SULLIVAN: Is this some type of function that a module might be used for in the future?

MR. THOMPSON: Yes, sir. It is part of that broad analysis of alternatives being considered. And just as background for the public,

previous concepts in the CMR nuclear facility that was intended to be one large footprint included a large storage vault. We have done a lot of work, as was stated in the first panel, to reduce the material-at-risk in PF-4. However, looking forward, I think a module could be dedicated to storage as a way to reduce some of the higher risk in PF-4.

CHAIRMAN SULLIVAN: Thank you.

Does the fact that there are actually these different programs that do involve, say, NASA, and there's some work in there that's done for Department of Homeland Security -- does that complicate the ability of NNSA to try to manage plutonium as opposed to, say, Y-12, which is pretty much an NNSA-only managed operation?

MR. THOMPSON: No, sir. I defer to maybe Mr. Kacich as well for his view. But I would say that actually is not a constraint but a benefit, because what we find is that capability that -- the set of capabilities that the Laboratory has at PF-4 that represent not only the technical experts but the specialized equipment and the facility itself are a unique capability, and in our world, for defense-related reasons, it's not necessarily just a part of the nuclear deterrent; it's actually an

active part of the deterrent. And so everything that we do in those other mission areas that you mentioned for NASA and for other agencies, what we find is, we have that capability that is primarily geared and focused on weapons work. However, that expertise and those specialized equipment sets can be used for other uses, and many times there is an active learning curve for the subject matter experts in the facility that we can leverage for other things that the nation needs.

CHAIRMAN SULLIVAN: All right.

Mr. Kacich, did you care to add? Mr. Thompson invoked your name.

MR. KACICH: I heard that, yes.

I don't -- I have little to add to that. I certainly agree with what he said. I think to your point, I would just observe that the more parties that you have involved in any given enterprise, interfaces, you know, tend to be an area of some complexity that take some additional work to manage, and I think that was implicit in your question. But other than that, I think Mr. Thompson addressed it well.

CHAIRMAN SULLIVAN: All right. Thank you.

All right, Ms. Connery.

MS. CONNERY: So Mr. McConnell, the 2017 stockpile stewardship and management plan described as Plutonium Facility is playing an important role in the stockpile stewardship strategy. Specifically it requires LANL to start producing qualified plutonium pits in the year 2021 and increasing pit manufacturing capacity to 50 plus pits by 2030. This comes from the National Defense Authorization Act of 2015 that requires you to demonstrate the capability to producing 50 to 80 pits per year in 2027. However, in 2015 the Congressional Research Service found that LANL had not rigorously determined the amount of material needed to support the pit manufacturing mission, nor has any such determination been communicated to us.

How does NNSA determine how much special nuclear material is needed to meet the planned pit production capacity and how does this affect the ultimate inventory goal for the Plutonium Facility?

MR. McCONNELL: Thank you very much. I have some thoughts. I think Mr. Thompson probably has some insights that you would benefit from, also.

First off, as you indicated, we have been directed by Congress and by other national authority to ramp up production. This, as Mr. Thompson said,

would require Los Alamos and the Plutonium Facility to engage in pit production at a level that they've not done before, a level that the country hasn't done in quite some time. So there is a learning curve that we're all going to have to go through, and so part of the reason to have these intermediate milestones of 10 pits, 20 pits, 30 pits on the way to 50 to 80 pits is for us all collectively to understand better what it actually requires to make high-quality pits at that level of output, what it means, everything from materiel demands to sort of classic industrial engineering, what is the process throughput through the manufacturing factory that could get to those levels of production, to how to we ensure we can do that safely and securely, how do we make sure we have the talented, skilled workforce that's necessary to do all of that.

I think we'd all be fooling ourselves if we said we had a really good crystal ball right now that said we knew exactly how those things were going to come out as we progressed from 20 to 30 -- 10 to 20 to 30 pits. But what we will surely do and what we are pretty confident right now is that our regulatory threshold for how much material we can have, this limit in the documented safety analysis

that Ms. Lebak has approved, sets on the main floor. So when we talk about the main floor, we talk about gloveboxes and the day-to-day work of the facility, it happens on this first or main floor.

We have a limit for that. We don't operate close to that limit. We operate with a margin. On any day-to-day basis, the amount of actual material that is on the first floor in the facility that we're working with is less than our regulatory analyzed level, and we believe that even in the future with these larger throughputs that the actual inventory will still remain less than the current regulatory threshold. So the safety systems and the analysis which are based on that number will still remain valid.

But I think Mr. Thompson could probably add some additional detail for you.

MR. THOMPSON: Thank you. Yes.

The only thing I would add is -- in addition to what Mr. McConnell said is, all of the current analysis that was done in 2008, which is the last time the site-wide environmental impact statement was done, analyzed for that 50-to-80-pits-per-year production that you mentioned, Ms. Connery. So we feel confident that we are appropriately

bounded in terms of our current operations and our path forward to get to those higher levels of pit production.

Having said all that, we are going -- undergoing now -- and I can defer to Ms. Lebak for more detail -- a supplemental analysis process to make sure that those analyses that were done in 2008 are still valid for the missions that we have going forward.

MS. CONNERY: So if I understand you correctly, you're saying you don't anticipate to challenge the limits that are already set for PF-4 in terms of the material-at-risk. In the event that you did challenge that limit and had to raise it, what would the process be and how would the public be informed that that limit was raised?

MR. McCONNELL: So in the last session we talked about a way that we maintain our documented safety analysis current, called an unreviewed safety question. If something that is a fundamental assumption or analytical technique of our current safety basis is either found to have been in error or challenged by our expectations going forward, then we invoke a process where we go back through the entire process of making sure we know what the

hazard is, because if we had to raise that number, the hazard would be greater.

Understanding, then, what the accidents are that could result from that with the consequences of those accidents would be, and therefore what controls are available that we would want to rely on that would interrupt that accident to show we had adequate protection. It could be that we would end up needing to put additional controls in place. It could be that we would have to offset the risk of increased pit production by figuring out how to reduce the integrated risk of some other part of PF-4 to, for example, lower limits or more containerization, or even through the AOA perhaps moving other process lines out of PF-4 into some other construct.

But at the end of the day, that would put us into what we would consider -- we would call a positive unreviewed safety question. So the Laboratory would have the obligation to go back and do a whole new holistic analysis that would come to the government for review and validation and it would ultimately end in a new approval by the field office manager of a new safety basis and a new set of controls.

MS. CONNERY: Thank you.

MS. LEBAK: If I might add, Mr. Thompson mentioned the site-wide environmental impact statement. The record of decision stated that the site could produce up to 20 pits per year. So we do have a follow-on NEPA activity that he mentioned we are going to look at a supplement analysis, and we have processes through the NEPA Act where we can notify the public of those analyses, analyses.

MR. KACICH: And if you will permit me to also add to that, I'm in agreement with Mr. McConnell's judgment about the likelihood of the existing limit being sufficient. As you have heard, we do have a number of capital construction projects, some well on their way and others contemplated, and coupling that with the improved use of the vault and safes and containers and so forth, I think there's ample reason to have that confidence.

MS. CONNERY: Thank you.

CHAIRMAN SULLIVAN: Mr. Santos.

MR. SANTOS: Thank you, Mr. Chairman.

I want to talk about the specific opportunities to reduce risk by reducing the quantity of material-at-risk. So if I may ask

Mr. Kacich, could you provide us with an estimate of the percentage of special nuclear material that sits in certified containers today with no damage or issues?

MR. KACICH: I think I might need to get some help on that one. I don't recall a good answer to that offhand. I'm sorry. Any of my colleagues?

MR. McCONNELL: I don't think we would want to venture a guess and get it wrong. Can we take that question and get to the particulars?

MR. SANTOS: Okay. Following on that, do you have a kind of master schedule or goal for a percentage of items you're looking forward to have containerized?

MR. KACICH: Well, I think I would point to what's been accomplished over the last several years where the degree of reduction in MAR since 2009 is on the order of 60 percent. So I think that provides one objective data point in connection with the progress that's been realized.

And beyond that, what I would say is that we're all about continuous improvement. And in addition to making improved utilization of the resources that I previously mentioned, we want to do it in a way that is respectful of our operators in

terms of the dose that they receive, the ergonomic challenges that they might experience, the ease of administration of the record-keeping that's vitally important here as well. So all of those pieces work together. The precise timing of when capital construction project improvements come into play and how they interrelate to variations in mission need and so forth makes it difficult to give predictions.

What I'm confident in conveying to you is that whatever the circumstances that we face, we're committed to make the most of it in terms of minimizing the MAR in the facility at any point in time.

MR. SANTOS: Thank you for that. I would like to follow up on the 60 percent MAR reduction that was code in 2009. Could you provide some insights on how much of that reduction was attributed to what I call a physical change, you know, such as repackaging the material into a certified container or relocating the material into a more robust configuration versus, let's say, an administrative change where, by analysis, you determine that the material can be -- you know, the consequences of the accidents can be reduced by looking at the existing container, whether it's

greater or -- can you talk about --

MR. McCONNELL: Sure.

MR. SANTOS: -- a break-out.

MR. McCONNELL: It strikes me -- and forgive me if I take just a minute to describe the concept of material-at-risk a little, because we're now getting into to subtleties here.

Material-at-risk is a descriptor of how likely material is to contribute to a consequence to human beings in an accident scenario. And so the form of the material and the method in which the material is stored or contained is relevant to that determination. For an example, just for folks, if there was material in a ball mill as a process that was in very fine powder, that would be the kind of material that would contribute significantly to material-at-risk. It's in a form and it's outside of a well-established confinement system because it's in a ball mill. It would be -- contribute to an accident.

Take that same material and put it in an engineered container, it's still finally ground powder, but it's in a container that would be robust. It contributes less to an accident. So it's less material-at-risk.

You could also take that material and change its form so that it could be larger solid pieces of metal rather than finely ground powders, and the larger pieces of metal are inherently less likely to contribute to a public consequence.

And the best thing you could do is just have it be gone entirely. Right? If you didn't need it and it was gone, it wouldn't be there at all. So all of those factors affect material-at-risk, which is what we're talking about here.

Our approach to safety at PF-4 and everywhere else is that if we aren't assured of the reliability of a control, then we conservatively presume that the control doesn't exist at all. Right? Right now we conservatively assume that our active ventilation system fails in a significant earthquake. If we have an uncertified container, if we have -- it looks like a good container but we haven't studied it -- we assume that it doesn't have any particular value to us at all, so we give it a damage ratio of 1. We assume it releases all of the material.

Now, if we take that same container and we invest in an R&D process and we actually have it

tested and we drop it from heights with surrogate materials in it and we put it in a fire, or we crush it, or we hit it with an object and we get real data on how the container performs, so that we now have surety rather than being unsure, we can credibly say that that container has value to us from a safety perspective and we reduce that number called damage ratio.

So in the last few years we've had a very concerted effort to do two things: To put material in containers that are certified. We have a very robust program to implement new containers. And we've taken the time and effort and the energy and the resources to go and test the containers that we already have. Sometimes we find out that the container isn't very good and then we use the research and development capabilities of the Laboratory to design a new container. We've done that, for example, for heat source plutonium. Sometimes we're lucky enough to find out that the container we designed at the beginning is actually fairly robust, and then we take appropriate credit for it.

I'm happy to say that we did a good job designing many of the original containers, and so

that after that more rigorous analysis, we've concluded that we can take credit for them. So a sizable amount of our reduction in material-at-risk over the last few years has been because we have gained confidence in the containers that we use, rather than moving the material out. As you well know, our efforts at Los Alamos to actually move material out of Los Alamos have been significantly focused on what's called Area G, the waste storage areas.

MS. LEBAK: I'd like to add that Los Alamos has been utilizing some very robust containers. We call them the Savvy 4000 containers, and that's just been in the last six years. So they're very, very robust. It doesn't mean the other containers are bad, but these are newer design, very robust. They go through a series of tests to make sure they can withstand different types of insults. And so I think it's, you know, a great addition to the nuclear material management program that we have at the site to incorporate some of these new containers.

MR. McCONNELL: I guess as almost a little bit of bragging here that Los Alamos has designed these containers and they're now at use across the

entire enterprise. So all the Department of Energy is benefiting from enhanced safety due to the Savvy 4000 containers designed at Los Alamos.

MR. SANTOS: Thank you.

A follow-up question for Mr. Kacich. Another opportunity is the use of the vault. Can you talk about some of the initiatives to improve utilization of the vault and talk about what the vault can do to further reduce risk?

MR. KACICH: Sure. So certainly it starts with the fact that material stored there is in a very safe location relative to other places within the facility, given the various accident scenarios that we need to postulate and analyze. And it's a complicated decision-making process starting with -- again, out of recognition of importance to the workers scenario where the dose that one worker would take on with spending time there is notably greater than other places in the facility. So we want to be judicious with sending people in there for that purpose.

Then, with respect to what materials have what purpose, immediate term or longer term, is a consideration. The completeness and availability of the criticality safety evaluations that need to be

in place, whether or not workers are trained to those, so there's a lot of parameters that need to be assessed in aggregate in order to take full advantage of that. It's also not a facility that we want to fill up and seal because the nature of the work there requires movement and manipulation to varying periodicities.

And so perhaps that's not as precise an answer as you might have been seeking, but those are some of the considerations that govern what we do and don't put in the vault.

MR. SANTOS: And my last question is: What other measures are you considering to implement some of the risk reduction in addition to the containerization in the vault? Any additional measures you're considering?

MR. KACICH: Well, I think we've touched on most of the improvement opportunities that we avail ourselves in from the standpoint of what material we have and how can we put it in as safe a condition as possible, and certainly in the discussions during the first panel, there was considerable discussion about the improvements from safety systems. So I think it's the two of those jointly that bear on the fact that over time we have

improved materially and intend to do so in the future.

MR. SANTOS: Okay.

CHAIRMAN SULLIVAN: So I'd like to ask a question now. And I'm going to ask it of either Ms. Lebak or Mr. Thompson, whoever wants to field it. But it has to do with material that's categorized as having No Defined Use.

So for the benefit of the public, we've been talking a lot tonight about material-at-risk, as opposed to material in the building that's not considered at risk, and I think Mr. McConnell just a few moments ago took a few minutes to explain what that meant.

But you take all that same material, and then there's another -- descriptive categories that all of that material is broken into, regardless of whether it's at risk, which is that which has defined use and that which has No Defined Use. And the most recent material management plan that was produced here shows that about 40 percent of the material that's in the facility is categorized as No Defined Use.

So I'd like to first ask you if you could just explain a little bit about what that means, and

then perhaps how you validate whether or not material has a defined use or not.

MR. THOMPSON: So thank you for the question, sir. I'll start, and I'm sure Ms. Lebak will correct me or add to it.

So first of all, the program needs that we have are very exacting in terms of material that we require for our stockpile. And to first order, defined use in large measure deals with material that is of the right purity and specification for our use in the stockpile. If something is deemed not -- has No Defined Use -- and let me back up and say defined use material essentially has no time limit. Once we determine that we have material that is good for future applications, we tend to hold onto it because we have very little capacity in this country to make more. So that's on the defined use side.

As you mentioned earlier, there's a large percentage -- I think it's 40 percent, that's what you said -- in PF-4 that doesn't have a defined use. A lot of that material is either contaminated in some way -- it may be plutonium with uranium components, other contaminant materials that make it less desirable for our mission work, in which case

it requires some level of either containerization or a processing to dispose of or to take to a final disposition.

We have -- as was said in a couple different ways in the first panel and in this one, we have an issue with waste processing overall in the system, particularly with the WIPP situation and how that evolves. So we are somewhat limited in our ability to move no-defined-use waste to that final disposition status. In some cases we would return some of the material that sits in the PF-4 vault today back to places like Savannah River or Y-12, where they could be further processed to its final end state. But all of those things are really predicated on whether or not the program can use the material in some future application before we make that determination.

MS. LEBAK: Sure. The material recycle and recovery program is about a $60 million a year investment for Los Alamos Lab. So we are able to fund from the NNSA level, you know, a sizable sum for the lab to work with materials. So they containerize it or -- right now we're going through a readiness process where the Laboratory is desiring to start up the aqueous chloride line. And so

they've -- they want to resume that operation. It was one of the operations that was paused back around the 2013 time frame. So we are attempting to get through that process right now. It's a readiness process where we make sure that the people, processes, and procedures are in place so they can resume that line. So that's one avenue where they can take material and put it into different forms, possibly extract americium out of that as a viable by-product of that line. And then we can also generate waste.

And so as we've said in the earlier panels, with WIPP just reopening in December of 2016, we hope to be shipping waste here by the end of the fiscal year. That's an aggressive schedule. It's our plan to open a new transuranic waste storage facility on site. So right now we have waste that we're storing at the PF-4 facility in the TA-55 area. And so when we open the new facility, we can take waste out of the Plutonium Facility in the vicinity, put it in the new storage facility, and at the same time we are preparing to ship to WIPP, hopefully by the end of the fiscal year. You know, that's an approximate date. So that's another avenue that is available to us and we're going

through all those technical processes right now.

So another activity going on at the national level is the ARIES program, and so our national leaders need to determine if there's going to be a mixed oxide fuel project at one of our other sites and if we're going to pursue other options for disposal of material. So we do have things -- we do have the ability right now to put material in newer containers. We can resume processing of the aqueous chloride, and then we have the true waste option of disposal at WIPP right within reach.

CHAIRMAN SULLIVAN: Mr. Thompson, I'd like to follow up. You talked about if there's material that is known that it could be used in a program, then it's a defined use. And if I understood you correctly, you sort of do that conservatively because we're not making any more --

MR. THOMPSON: Yes, sir.

CHAIRMAN SULLIVAN: -- plutonium. So to use an analogy, if I had a certain type of special motor oil that I use in my automobile, then that would be defined use for my automobile. But if I had a hundred cases of it, then I couldn't reasonably use it all because the vehicle won't last that long.

MR. THOMPSON: Right.

CHAIRMAN SULLIVAN: So do you analyze for that sort of scenario in terms of trying to make a good-faith estimate of what realistically might be used as opposed to what might be excess?

MR. THOMPSON: Yes, sir. Thank you for the question and the follow-up.

One of the aspects of this we haven't talked about yet is the idea and actually the premise behind an economic discard limit, which primarily we use both at Los Alamos and Y-12 for uranium and plutonium. So in those cases where we have material that might be useful to future mission need, we go through an economic analysis to say, what would it take to purify the material and what benefit would that yield versus how much would it cost, how much time it would take to do that, and whether or not we have the facilities even to do that.

So that factors into essentially what may stay in a defined use category or drop into the no-defined-use. I don't know if that helps.

CHAIRMAN SULLIVAN: Yeah, it does. Thank you. So I guess I'll just ask if you're confident that we don't have a scenario, say, here at PF-4

that would be analogous to my hundred cases of motor oil scenario. Is that --

MR. THOMPSON: No, sir. We have -- although there is a lot of material that is available for future mission use, I would not say that we have a hundred-case-motor-oil situation.

CHAIRMAN SULLIVAN: Okay. Thank you.

MR. THOMPSON: Yes, sir.

CHAIRMAN SULLIVAN: I wanted to follow up with Ms. Lebak, because you talked about the problems at WIPP and how that is holding up being able to dispose of some of this material that is no-defined-use. But is there material in the building which can't go to WIPP which doesn't have any disposition path identified at all? Do you have some of that?

MS. LEBAK: Yes, we do have some material that does not have a currently identified disposition path at this point.

CHAIRMAN SULLIVAN: Okay. So -- and what would you say is the overall NNSA strategy if PF-4 is not a permanent repository itself so someday it has to go somewhere?

MS. LEBAK: I agree. I mean, we do have some items that have uranium content and other items

that we know -- we know what we have and they don't contribute greatly to our material-at-risk because of their current composition. So we just need to work with the laboratory and our counterparts with headquarters and keep working on this issue. I mean, it's been an issue in the complex for several years, and I think we've made substantial progress on it, but there are still what we refer to as cats and dogs that we, you know, don't have the defined pathway for at this point.

MR. THOMPSON: The other thing I would add, too, just to that is not only is it the composition material that is stable, but we also prioritize those things because we know we're going to be hanging onto them for a period of time before the final disposition is determined, that they're in the highest secure locations in the facility and in the appropriate containers as well.

CHAIRMAN SULLIVAN: Is there any specific review that's done on any periodic basis to say, we're this at high level, this material is looked at in order to try to determine a path forward as opposed to a scenario where, okay, it's out of sight, out of mind, and we've just got other things to do, and decades from now we might come back and

have the very same discussion? Do we have a review that's done rigorously at some periodicity to try to determine a disposition path for these materials?

MS. LEBAK: We have data calls periodically for this type of material, and we work -- it's a different part of our headquarters organization. But we do catalog the information, we provide it in a periodic report, and I know there are meetings. I can't say the periodicity of the meetings, but there are teams that work on this over time.

MR. THOMPSON: I would just add, too, that not only are there periodic reviews, as Ms. Lebak mentioned, but I think a lot of times we have very situational dependent at every site that has large capital investments to make. Part of that is -- part of that process that we mentioned earlier in terms of modules in the future and potentially weighing alternatives that might come out of that -- that kind of discussion and breadth of comprehensive analysis drives a lot of that because we don't want to necessarily pay for a high-rent space inside PF-4 for an indefinite period of time, when we know that space is precious to us for program reasons as we ramp to a product in the mid '20s, for example.

That's going to take -- that amount of material and pit production is going to take more space, and so we're looking much harder because of that at the materials that are in the status.

CHAIRMAN SULLIVAN: And if I was interested in more information, just trying to figure out the decision-making process, who is responsible for this? Who would I ask that question of?

MR. THOMPSON: The person responsible is the material recycling recovery manager that works for me, so it would be through me.

CHAIRMAN SULLIVAN: Mr. Santos, I believe you have the next question.

MR. SANTOS: Thank you, Mr. Chairman.

I want to focus more on the option of the transuranic waste and all the waste management aspects and the challenges there as they relate to risk reduction initiatives.

So some of the no-defined-use material within the plutonium facilities is destined to be dispositioned as transuranic waste. You all have listed some of the challenges. I just want to repeat it for the benefit of the question. You know, area G is not accepting new waste.

Transuranic Waste Facility is in the process of starting operations, but it is my understanding that at -- currently it won't be able to accept the majority of the transuranic waste from the Plutonium Facility. As you know, the majority of the operations at the Plutonium Facility were paused for multiple years due to conduct of operations and criticality safety issues, and when those facilities resume, new generated waste is going to probably be staged at the Plutonium Facility and much uncertainty exists regarding the near-term rates of waste disposal and the timing to go to the waste isolation pilot point.

Can you please discuss the impact of this impaired waste system on the risk reduction activity which tends to, you know, disposition as transuranic waste?

MS. LEBAK: I'll take the first shot at that, if you don't mind.

So first of all, I think it's a good news story that the WIPP has reopened and they're beginning to receive shipments from around the complex. I think that's great news. We also have a brand new $107 million transuranic waste storage facility ready to come on line. Our goal is

September-ish to receive waste in that facility, and it can handle up to 1,250 drum equivalents. So it's several buildings at that facility, and I'm -- this project has been in the capital line item space for several years. And so I'm happy that we're going to be able to use that facility in the very near future.

We still have our processes we need to go through to make sure things are ready, and we will do that. We're in the process of doing that right now. The lab is conducting their readiness review, and that will be followed by a federal review, and the headquarters will give approval to actually start that facility up.

So in the meanwhile, we have worked with the New Mexico Environment Department, and we do have some waste stored out on some of the pads at Tech Area 55. We want to minimize that storage on the pads, and when we can get into this new facility and get into resuming waste shipments to WIPP, we think that some of the pressures in the facility will be alleviated because we will have the ability to go stage in the new facility and then ultimately ship to WIPP. So I think all that's very good.

I also think that since the pause in 2013,

we brought up several of the activities that were paused. These activities require about three levels of review to -- I mean, this is once the laboratory decides they want to bring a process back up. They do a management -- what we call a management self-assessment, and then they do a readiness activity, and that's followed by a federal readiness activity, and we probably brought seven processes back up. So that's over 20 reviews that's been conducted on some of the processes in the facility in the last year and a half.

And when we do these reviews, the Laboratory uses people at the Lab and they draw on their parent company resources to bring in those outside eyes. And for the federal reviews, I use my staff, and we also bring in some of the Feds from the other sites, and oftentimes from our headquarters locations as well.

So this is a good opportunity to work with the Laboratory, work with different entities, bring outside eyes in to look at the operation. So I think bringing these operations back up, presumably they will generate more waste, but we're right at the cusp of being able to open that pipeline again for getting waste outside of the Tech Area 55.

And our DOE environmental management colleagues are now in charge of Area G, and, I mean, there's always an opportunity there where we could dialogue with them in the future and see if there might be any additional capability there. But that's -- we actually are bringing on line this new facility, which will be very helpful in this process.

MR. SANTOS: Thank you. A follow-up question to -- I'm sorry, Mr. --

MR. KACICH: I was just going to add a little bit to Ms. Lebak's answer, and it speaks a little bit more to the process in the area of attention that we have at the laboratory that's been on the rise of late, and to your question of risk reduction and risk management. And in this particular instance, it's quite germane that we have a separate site office for environmental management and I'll say the premium that it places on kind of a site-wide or enterprise-wide look at the issue as opposed to a more territorial one. And in fact, just last month we convened the first meeting of a new group that we constituted with the goal of making sure that we had all the parties who have a role to play to optimize this solution going forward

in attendance, and work is continuing on from there.

So I'm just adding to her answer in the sense that process-wise with the additional complexity of a separate site office and soon a separate contractor, the best decisions require an integrated look at that, and we have some improved institutional processes in place to try to leverage that.

MR. SANTOS: Thank you. That's actually a good lead-in to the question I would like to ask Mr. Thompson.

Can you explain what arrangements have been made to ship newly generated waste from PF-4 to WIPP and what priority is given to this waste from PF-4 compared to the other waste across the entire complex?

MR. THOMPSON: So thank you for the question. I don't know if I'm the best one to answer it, but I'll take a shot. I think I'll ask Jim to jump in. Thanks.

MR. McCONNELL: So we're very pleased that Los Alamos ended up being one of the four initial priority sites that the Office of Environmental Management and the National True Waste Program identified as at the front of the list to resume

shipments to WIPP, along with sites such as Idaho and Oak Ridge and Savannah River. So it is a very encouraging thing that Los Alamos is on that list. There are other sites that are still waiting to resume shipment.

Now, we have work to do between now and the end of the fiscal year to get to the point where we can demonstrate to ourselves and to the folks in Carlsbad that the processes we use and the waste that we're going to ship to them will meet all of their expectations and all the waste acceptance criteria.

We are not -- Los Alamos is not planning to be one of the larger of the -- actually, it's the smallest of the four sites that are currently identified to begin shipping. And so sooner or later, the obvious answer is that we're going to need to increase the capacity of the entire enterprise to dispose of waste at WIPP in order to bring in those other sites that aren't currently on the priority list and also to increase the amount of shipment that we do from here at Los Alamos, so that we can more rapidly draw down the true waste that we have generated and stored, and eventually get to the point where we ship waste to WIPP at a rate that is

greater than or equal to the rate at which we generate it.

And as you heard, our mission scope is going to be increasing over the next few years, and that will inherently mean that if we -- we generate more transuranic waste when you make 30 pits a year than you do when you make 10 pits a year, so we're going to need to continue to work collaboratively with our friends in environmental management in order to make sure we can get that done.

There are a lot of people in the enterprise who wish they were in Los Alamos's spot and at least has a path open right now to begin shipping.

MR. SANTOS: My last follow-up question -- thank you for that -- is to Ms. Davis-Lebak is: Can you describe some of the activities that you need to do to get ready to ship? And when will we expect that to happen?

MS. LEBAK: Okay. We have a DOE order, which is one of our basic requirements. It's called 425, DOE order 425. It's a nuclear facility readiness. And we need the laboratory to make sure that they have gone through their processes, make sure we have looked at any safety documentation,

that we've looked at training, we've looked at can the people execute the procedures that they've written and do the work absolutely safely.

And so first the laboratory goes through a process and they determine, you know, what level of readiness that they believe is required per our DOE directives. Then we collaborate at that point and make sure we agree that, yes, it's this type of review or maybe a more stringent review. And we have to have the place to actually make the shipments from.

And so as the Board has been very apprised of our facility called RANT, which has historically loaded the TRUPACT containers, we've had a seismic issue that was identified. You know, we've worked with you on that. We've had periodic briefings on the RANT facility, and so we plan to do the loading operation at TA-55. So we have to develop a -- you know, make sure our safety documents are proper and we have all the -- the components of the readiness process done at the Laboratory level. Then the federal personnel come in and do the appropriate reviews. And so a lot of times that involves an active demonstration of what the Lab intends to do.

So in the case of shipping to WIPP from

TA-55, they brought in -- they demonstrated the capability with the trucks and what have you in 2016. Our readiness requirements talk about recent and relevant demonstration of the activity. So we worked with the Laboratory. We said, "We probably need to do this again. It's 2017." So we're going to start that process here soon.

So we also have to work very closely with the Office of Environmental Management. They have a schedule, a rolling schedule. We need to make sure we're on the rolling schedule, and all that has to converge nicely, you know, in the next several months. But at the same time, we're going to be going through the readiness on the new TRU waste facility so we can move waste from TA-55 to the new facility and stage it there until such time it can go to WIPP.

MR. SANTOS: That's a lot. So when is your expected date to ship to WIPP?

MS. LEBAK: I mean, this is -- early fall is our plan.

MR. SANTOS: 2017.

MS. LEBAK: Yes. Early fall is what we're planning to locally.

MR. SANTOS: Thank you.

No more questions.

CHAIRMAN SULLIVAN: Mr. Hamilton.

MR. HAMILTON: Thank you, Mr. Chairman.

I'd like to discuss life cycle planning, and I'd like to address the questions to Mr. Thompson, please.

Some NNSA programs have not always planned for the complete cradle-to-grave life cycle of the nuclear materials and waste generated as part of their mission, and that's required by DOE order on nuclear materials. Can you tell us what actions have been taken to assure that the program complies with this requirement moving forward?

MR. THOMPSON: Yes, sir. Thank you for the question.

I don't know if there's any specific action I can point to that would state that we're now following the order that we potentially haven't been in the past. I would say it this way. In facilities particularly at Los Alamos, since we're talking about plutonium facilities, that has been the case where facility programs occupied certain parts of the facility and their funding was truncated virtually in one cycle unexpectedly and the rest of the programs in the facility were

required to essentially pick up the slack in terms of the care and feeding of the facility going forward.

As a matter of practice, that has only happened a couple of times in my memory in the last 20 years or so in PF-4. For the most part, I think we do, in fact -- that is an anomaly to what is standard practice in following the DOE expectations for life cycle planning. So that's not to say we haven't had it in the past, but it's typically anomalous in regards to funding continuity from Congress.

MR. McCONNELL: If I could add one thing to that, certainly it's consistent with RCRA in that the generator is responsible for the disposal and for the management.

One of the things we've been very explicit about, both the Laboratory and the Feds, is that undeniably we have had some times in the past generated waste that was not compliant with our disposal paths, which is why we have some problematic waste now. We have made a commitment that that will not occur any more in the future. We will not put waste in the new Transuranic Waste Facility that is not compliant with the disposal

requirements. We are not going to -- and if perchance we were to find out that something changed, that that is the obligation to go back to the generator, which in this case would be at PF-4.

And so it is knowing that the generator would have to upset their program and their process in order to accept a drum back into the facility to repackage it or whatever the case may be is a pretty significant deterrent against creating that noncompliant drum in the first place. And so now that we've been very adamant that our new TRU facility is not a place to put problems, it's a place to temporarily stage compliant waste on its way to WIPP, is a very important thing we've communicated to all of the generators.

MR. HAMILTON: And I think you addressed this, but just to make sure I understand. I'm trying to understand how you're going to account for increased waste generation rates as your mission and production rates increase. Is there something specific or a specific example you can give me of how you're going to address that problem as the rates increase?

MR. McCONNELL: That is a -- as I just alluded to, that is a national-level issue to get

the disposal capacity of WIPP up to the point where it is suitable for the demands not only at Los Alamos but of all the places across the enterprise, both in NNSA and the rest of the Department, that generate transuranic waste. So clearly we have to come together as a largest community, our laboratories, other laboratories like the Savannah River National Laboratory and the Oak Ridge National Laboratory and others that have an interest in this to help us figure out how to best attack this national level, national laboratory level problem.

On our part, what we have to do is figure out how to optimize the storage and the packing of waste so that we can ship as much of our waste as possible in all -- in whatever shipments we are allocated.

One of the challenges we have right now with this overall system is that sometimes we can find ourselves limited by -- I'm not going to get into the details of it, but there are many, many different attributes that have to be satisfied in order to have a compliant waste that can go to WIPP, and sometimes the attributes that are limiting for us are not how much material-at-risk is in the

package. And so we end up shipping things that have less material than we would like, but they are bouncing up against some other limit. So we have to figure out how to optimize our waste so that we get more effect per TRUPACT.

MR. HAMILTON: Okay. Thank you.

No more questions, Mr. Chairman.

CHAIRMAN SULLIVAN: Ms. Connery.

MS. CONNERY: And thank you for your time on this panel, and I'm going to introduce a different line of questioning, a critical one.

In 2013 the laboratory director paused all Plutonium Facility programmatic operations due to identified deficiencies with the nuclear criticality safety program. And just in 2016 the annual report from the DOE's nuclear criticality safety program was submitted to us and indicated that LANL's criticality safety program remains noncompliant in several areas and does not meet expectations.

So my question will start with you, Mr. McConnell, and if you could tell us what the rationale and the basis for reaching that conclusion on the safety program here at LANL.

MR. McCONNELL: Thank you very much. As you know, I was one of the people that signed that

report.

What we did in this report was to make sure we communicated -- and it isn't just Los Alamos and it isn't even just NNSA. It's all of the defense nuclear facilities that have potential for criticality in whatever program office they might reside reports to the safety board. And the most recent report describes each location in terms of its absolute position relative to our expectations and requirements. So while Los Alamos is making very good progress in improving, they aren't done improving yet, which means that they are still below our requirements. And so the adjective we -- the color we applied to that was that they are red. We have a requirement, and while they are improving, they haven't achieved that requirement yet. So we gave them the one and only red rating of all the sites that reported in that issue.

There are sort of three main reasons we had to do that. First off is we have concerns about the number of people at the laboratory who have this very unique skill set to do criticality safety. And while they're making very significant improvements here at Los Alamos, the number was still -- is still less than they wanted. They added five people in

that -- and in this area, five is a lot, last year; hoping to add six this year. So they're making pretty substantial improvements in staffing this function.

The second problem was that there are areas of the facility -- or there are operations or things where the criticality safety evaluation, this very unique and rigorous analysis that has to go in to demonstrate that under certain circumstances and controls the likelihood of an inadvertent nuclear criticality is sufficiently and extremely low. Some of our operations have analyses that are not as complete or robust or as well-constructed as our current expectations. I can't give you the number, but there are hundreds of these evaluations for the activities at TA-55.

And so the Laboratory has a commitment to go -- to both maintain the analyses necessary for all the work that's -- the new work that's coming down the road, but they also have to go back and work off this backlog of legacy analyses to improve their content and their quality. And they're making progress on that, but they still have many -- numerous places and numerous activities that have old analyses. And in some cases we go to the

extreme point of saying that you are not allowed to use that operation until you get a new analysis. And so we just disallow operations until we get a new one.

The third thing is, we have areas of the facility that we -- the term we use is "infracted." There's something about the actual activity that is sufficiently different from what we assumed or analyzed or require that we say, "Okay, you are not in compliance with the criticality safety."

And some of it can be -- for example, one of the things we've come across is that we have had in the past from a design perspective, given the designers of the containers and things, nominal dimensions. Make this container about this size. But for criticality safety, we have to assume some specific dimensions. And so now we have to go back and say, "Not good enough to do specified nominal dimensions. We have to specify either minimum or maximum, something that allows us to do bounding analysis."

We're working through those. Los Alamos is working through this. The last plan that I had seen anticipates that as much as 90 percent of those infracted conditions might be addressed this fiscal

year. I'd be happy if that were the case.

But in the meantime, we will conservatively address those operations and limit what we do or don't allow so that we know we're safe from a criticality safety perspective.

I guess, in summary, I would say that progress is good. If I were to rate them at progress, it would have been a better color. But the truth is that absolute value is they aren't where we need them yet, and they don't believe they're where they want to be yet, and we expect that to happen soon.

MR. KACICH: So if I might contribute to the answer.

In varying ways, virtually all of the panelists have talked about the imperative of safety in everything that we do. I don't think there's a more profound demonstration of that other than how you started your question by saying that the director paused operations in the one and only facility of its kind because of the lack of confidence that -- and the ability to operate it safely. So notwithstanding what Mr. McConnell articulated -- and I don't disagree with a word of it -- this is an area of high attention to the

Laboratories, and it has been for some time. And notwithstanding the red color, the current configuration with respect to the Laboratory's viewpoint is that it is safe and it is getting better and it's only a matter of time before we achieve the standards that both we and the department expect.

MS. CONNERY: Well, I appreciate your optimism.

MR. McCONNELL: If I wasn't clear about that, I want to make sure I'm absolutely clear. The things that we -- the operations that we actually -- Ms. Lebak actually allows and the Laboratory allow to go on an operation activity-by-activity basis have to meet our standards. We would not allow the work to go on if they didn't meet our standards. There are some things where we don't allow work right now because they don't meet our standards and that set -- because that set exists, we put out the metric that you alluded to.

MS. CONNERY: I appreciate the fact that you are willing to come out and call it red. You talked about the hiring that has been done, and you've also lost six criticality specialists in the past 12 years, and if you're replacing them with

people with less years of experience, that's certainly not an equivalency if you replace six for six, and I know that you appreciate that.

It is a crucial area for you to be able to move forward. You talk about the vaults and being able to put material in the vaults you had need to have that crit calculation done to do that, and so it is hampering you in addition being a safety challenge.

So I guess having gone through this in 2013, are there any lessons that you have taken from 2013 that you're applying now in order to be able to ameliorate this problem?

MS. LEBAK: One thing to note here, the skill set is kind of at a premium across the complex. And so when we receive -- or the Laboratory hires five new people, we're basically cannibalizing from other sites. And if our folks leave, then they're probably going to another one of our sites.

So the Laboratory petitioned us to work with them on some retention programs for the crit safety analysts, and we did that. We said this is extremely important. It's a finite number of people with a specialized experience, and we work with the

lab, and they -- we approved the program that they asked for our approval on through the contract. And then they gave it some run time and it still wasn't yielding the desired result. So they came back to us a second time and said, "We want to revamp the program. It's not having the desired effects."

And so at that time they also included some of the safety basis positions, which is another kind of unique set in the Department of Energy, and so safety basis analysts are often, you know, moving around, and it's a long training program; and to get the people with some experience and the requisite training, it can take a while.

So anyway, we worked with the Laboratory and approved that recently for some of the crit analysts and the safety basis analysts. The laboratory is also looking beyond just, you know, cannibalizing from other sites and this retention program. And they're starting to work with a handful of the universities and to try and, you know, grow the skill set indigenously from the universities.

So, Rick, I don't know if you want to jump in, but definitely we've tried to work this issue, you know, hand in hand because it is a -- it's a

valuable skill set for these analysts, and we require them for our work.

MR. KACICH: So I'll just add -- and I'll start with acknowledging the high validity of your initial comment about the fact that it's not just people but they need to be capable of doing the work that we need them to do.

So in addition to what Ms. Lebak covered, beyond the raw numbers of people that we have, the other opportunity we're in the midst of exploiting is improving the efficiency of the work they can do. So some of these infracted cases that Mr. McConnell just talked about, we're going to have a much more efficient way where a small number of analyses will encompass a large number of infracted cases. So that's the other lever that we're using to improve the ability of our existing workforce, of whatever size it has, to contribute to improving the score card that Mr. McConnell summarized.

MR. McCONNELL: If I might just add one more thing. This is a broad problem. I've told my rising college senior that if he wants job security and a high-paying job, he might want to think of becoming a criticality safety analyst. We need people for Los Alamos. We need people for Oak

Ridge. We need federal people to do this work, and it's all the same pool. And so what we really need to do is increase the overall size of the pool. Thankfully, due to some previous recommendations of the Board from the last decade, we have a nuclear criticality safety program which is run out of my office where we annually spend, you know, a few tens of millions of dollars to make sure we sustain a criticality safety hands-on training program to both train the new analysts at a very deep level but also to get appreciation of first-line supervisors, managers. Certainly our staff goes and I think some your staff, perhaps even some of you, have attended some of our training at the more awareness level; that that is necessary in order to increase the overall pool of this very critical resource so that the entire department spends less time just trying to hire away each other's experts.

MS. CONNERY: The Chairman's giving me the hook, but I just want to say that I do appreciate the fact that we're cannibalizing across the sites, and I think I might have stolen one of your crit specialists recently.

MS. LEBAK: That does come to mind.

MR. McCONNELL: The former head of the

program I just talked about.

MS. CONNERY: But I would say it would be helpful to maybe consider whether or not you should come up with a pool of specialists that could be deployed across the sites in case of a critical need at a future time.

CHAIRMAN SULLIVAN: We promised the public they'd get their chance at 8:30, and it's now 8:36. Mr. Santos, did you -- you're good?

MR. SANTOS: Thank you.

CHAIRMAN SULLIVAN: Okay. All right. Well, then, I'd like to thank the panelists for patiently enduring our questions and at this time I'll give you a minute if you want to step off the stage before we begin the public comment section of this hearing.

At this time the Board would like to provide an opportunity for comments from interested members of the public. A list of those speakers who have contacted the Board was posted at the entrance to the room, and I have a list here where people have signed up. I'm going to read from that list just so that everybody has an understanding of who's on it and where they fall -- if they're on it, where they fall in the sequence. And I apologize in

advance if I mispronounce anyone's name.

So first is Jay Coghlan. Second, Tris Deroma. Number three, Greg Mello. Number four, Chris Fischahs, F-I-S-C-H-A-S. Number five, Scott Kovac. Number six, George Anastas. Number seven, Marissa Naranjo. Number eight, Anna Hansen. And number nine, Janet Greenwald.

So to give everyone an opportunity, I ask that speakers limit their comments to five minutes. If there's additional time at the end, we will circle back and provide anyone else an opportunity to take up the extra time from what we have allotted.

Remarks should be limited to comments, technical information, or data concerning the subject of this public hearing. Board members may question anyone providing comments to the extent deemed appropriate, and if there are any written statements, we'd be happy to accept those for the record.

So with that, I'd like to ask the first speaker to come forward. And as each speaker comes forward, if you are representing a particular group or if you're simply representing yourself as a citizen of Los Alamos or a citizen of New Mexico,

then just please so state.

So the first person is Jay Coghlan.

MR. COGHLAN: I'm Jay Coghlan with Nuclear Watch New Mexico. First of all, I want to state my appreciation for the Board. Thank you for this opportunity. And to illustrate how I'm aging, I've been following the Board since the late 1980s. Your efforts are very much appreciated.

Now, I'm going to start by observing that in the late 19- -- or excuse me -- the first half of the 1990s, the Department of Energy conducted what I considered to be a public relations campaign claiming that pit production at Los Alamos would always be safe and that PR program was caused or needed because of the notorious Rocky Flats plant. And it's only by good luck that Denver was not irradiated in the 1969 Mother's Day fire and that the roof to Building 771 did not collapse.

But I'm cynical and have grown more cynical over time about these proclamations that plutonium pit production would always be safe at Los Alamos. And I think that some of the past and recent events illustrate my point.

The first thing I'm going to do is credit a former NNSA nuclear safety officer at the

Los Alamos site office that was driven to become a federally protected whistle-blower. It's the late Chris Steele. But for example, he pointed out how Los Alamos was still taking credit for the fire suppression system after the complete collapse of PF-4 in the event of a severe seismic event.

And then building from that, we have the recent fire just a couple of months ago, which, of course, initially was played down in the public. Later an ambitious or good reporter here came out with some of the details that pointed out that that fire was more serious than initially portrayed. We have the simple fact that PF-4 was shut down for more than three years because of nuclear criticality safety concerns.

And then I could offer more evidence, but I'll just close with the fiasco with WIPP that, as you all know, was generated -- or was caused by a radioactive waste barrel generated by Los Alamos. And all of this gives ample cause for concern about how safe future plutonium pit production will be at Los Alamos.

Now, I want to be practical. I want to make some specific recommendations to the Board, and I'll start with the easy ones and build up to the

more difficult ones. But to begin with, I think the Board should very much insist upon robust, active confinement systems that will withstand the design basis earthquake. And Los Alamos and other NNSA sites have long had a history of resistance to that. But I admire the Board's constantly sticking up for that very point and hope that you'll do so on into the future.

Another recommendation -- and this is something that has dismayed me over the years, but I will state that Los Alamos has gotten better. Like a decade ago the Lab was woefully behind on having updated safety basis. As I said, they've gotten better, but I believe one of the most crucial things that you could do to protect both the occupational worker and the public is to verify that indeed the laboratory is absolutely up to date in its annual formulations of the safety basis.

Let's see. My third recommendation -- and, again, I'm getting -- I'm ascending to the more difficult recommendations. I think the Board should be charged or somehow assume the charge to certify -- and I'm suggesting a formal certification -- that all nuclear safety -- or all criticality safety issues have been fully resolved.

As you all know, these issues have been going on for years and prompted the multi-year shutdown of PF-4. And there's actually some precedence for this certification actually being a required element. I'm going to credit my colleague, my fellow colleague, Scott Kovac, for pointing this out to me. But the 2009 Defense Authorization Act actually had a mandate that the safety board had to certify that the design of the CMRR at that stage was seismically safe.

Now, I'm going to say some things that I know are beyond your purview, and obviously you all just can't self-declare that mandate. Congress would have to do it. But I hope we could have something similar to that situation back in 2009.

CHAIRMAN SULLIVAN: Mr. Coghlan, you're at five minutes. Can I ask you to wrap up, please?

MR. COGHLAN: I will wrap up with my most difficult suggestion.

I urge you all to look at the proclaimed mission more closely. There's been a lot of talk about how mission drives material-at-risk. Now, I know I have to be brief. The legislation, section 3113, of the 2015 Defense Authorization Act mandating expanded plutonium pit production was

written by a staff member of the House Armed Services Strategic Forces subcommittee. He's from Sandia. I will submit to you that much of this is the tail wagging the dog. It's rather convenient for the Laboratory to have this congressional requirement.

Furthermore that requirement -- I will close, Chairman -- furthermore that requirement is to produce pits for the interoperable warhead that the Navy doesn't want, and I know that because I have a Navy memo.

CHAIRMAN SULLIVAN: Thank you. Thank you. We're at six minutes, and I'd like everybody else to come, and if there's time you can provide that at the end.

MR. COGHLAN: I will -- we will submit written comments that will be more comprehensive. But thank you again.

CHAIRMAN SULLIVAN: Thank you. Tris Deroma.

MR. DEROMA: That was a mistake. I'm just a member of the press.

CHAIRMAN SULLIVAN: Okay.

MR. DEROMA: I don't know how I ended up on the list.

CHAIRMAN SULLIVAN: All right. We'll move on. Greg Mello, who I know is not a mistake.

MR. MELLO: Yes. Good evening. Nice to see you all again, and thank you so much for coming out here.

CHAIRMAN SULLIVAN: And you represent?

MR. MELLO: The Los Alamos study group.

I want to refer to Mr. Hamilton's onion, and I think that's where we should start. When we talk about the technical safety issues, we are at the outer layer of the onion. And we have -- Jay has introduced the issue of the uncertainty about missions. I would concur with all that he said there.

The missions which are driving these requirements at PF-4 are contested and often disrespected by members of Congress, let's say. By -- Jay said the Navy doesn't really want interoperable warhead number 1. The Air Force has also said in meetings of the Nuclear Weapons Council that they don't really want the interoperable warhead, either. I think I mentioned this to you guys in Washington.

So we have no actual need to make pits; not now, not in the foreseeable lifetime of the PF-4

facility. Many people, knowledgeable people, talk about the lack of mission need for ARIES. ARIES is kind of a hobbyhorse, people say, and in that we would concur because MOX, the MOX project is itself its own little onion of -- it's a self-licking ice cream cone of its own.

The material purification processes at LANL with their associated -- what was that -- the economic limit -- discard limit, those are also contested and the scale and intensity of those operations are also something that could be looked at.

All told, Los Alamos PF-4 suffers from a kind of a mission greed, you might say, which is fed from the congressional committees through the revolving door personnel, as Jay mentioned, but it goes beyond that as well. NNSA as a whole, as GIO has said many times in many places, has much more mission than it has dollars to fulfill. But it's not just dollars; it's capacity, management capacity. It's skills, as we've heard, with criticality. Overall NNSA will be heard here tonight. NNSA is looking to cut back somewhere. Their vast number of missions which are going forward have cost overruns and they suddenly realize

they're much more complex than they actually thought.

So what we heard here tonight is the first official public discussion of disinvestment in PF-4: How we can cut back on safety class, fire protection, cut back on safety class, active ventilation system. We've heard that the seismic structural aspects of the facility are just fine. Well, I don't really think -- I think, Mr. Sullivan, I think you said last fall that that's not assured in your letter closing out one of your recommendations.

What we -- right now there's confusion at NNSA. They don't exactly know what they want to do or why or how. What we see and hear here tonight is complexity and confusion. That's dangerous, and it will lead to fiscal waste and safety problems down the road.

We also hear a lot of partial truths, euphemisms, evasions. Part of that is classification, but part of it is just because people don't know exactly what they're doing. So we've been around a long time. My involvement with the site started in 1984. There's changing times, changing stories. In 1996 DOE said that Los Alamos

could make 50 pits per year without investing anything in capital, any kind of capital expense. And that's the basis of which Los Alamos got the pit production mission over Savannah River.

The risks -- let's see. The --

CHAIRMAN SULLIVAN: Mr. Mello, you're almost at five minutes.

MR. MELLO: Okay. The -- we've heard about the rare design basis earthquake generating the design basis accident. It's unlikely to be that rare extreme accident that shuts down PF-4 in the end. The problem will be a concatenation, ramifying compensatory measures and failure to invest in the facility as it should be invested in. There's always been from the inception of the AEC all the way through a tendency to run away from problems, disinvest and build a new thing. And I submit that that's part of what we're seeing here tonight, because it gets very difficult.

And I know I'm out of time. I appreciate your patience, and if there's time, I'd like to continue later.

CHAIRMAN SULLIVAN: Thank you.

The next speaker is Chris Fischahs, who will hopefully tell me how to pronounce his name.

MR. FISCHAHS: "Fish-us."

CHAIRMAN SULLIVAN: Fischahs.

MR. FISCHAHS: Yeah, a resident of Los Alamos, New Mexico.

Dear Chairman Sullivan and members of the Defense Nuclear Facilities Safety Board. My name is Chris Fischahs, and I'm here to speak as a resident and concerned citizen of Los Alamos, New Mexico. These views are not to be mistaken as views of the Los Alamos field office and/or NNSA.

Tonight I'm here to express my concerns with the low-level waste water treatment facility under construction at LANL's Technical Area 50. The LLW treatment facility, LLW, is a defense nuclear facility within your oversight responsibilities, as I understand it.

LLW is a new less-than-hazard category 3 DOE nuclear facility which is being built to replace in part the 50-year-old radioactive liquid wastewater treatment facility where I worked for five years as a cognizant systems engineer.

When the original LLW design was put out for construction bid, it included installation of an ASME AG-1 code on nuclear air and gas treatment compliant HEPA filtration unit in buildings' exhaust

ventilation system. HEPA filtration is used to filter airborne radioactive particulates from air prior to exhausting it outside as to mitigate the radiological consequences to the public, collocated workers, and the environment.

I continue to believe that it is a sound and reasonably achievable engineering principle to install an ASME AG-1 compliant HEPA filtration unit in the LLW exhaust ventilation system. Without it, there is no engineered control to remove radioactive particulates from the building air prior to it being discharged. This failure to maintain confinement of radioactive materials would appear to be contrary to any reasonably conservative design requirement, especially for a new DOE nuclear facility.

The unfiltered exposure potential from LLW radioactive releases could be analogous to the consequences from WIPP radiological release whereupon station 1 had 3 millirem. Installation of a HEPA filter unit in the nuclear facility's exhaust ventilation system would lower this public and worker exposure and release to the environment 99.97 --

SPEAKER FROM THE FLOOR: We can't hear you because you're not speaking into the mic. It needs

to be closer to your mouth.

Thank you.

You need to move it up to your mouth, yeah, and speak closer to it.

MR. FISCHAHS: And release to the environment by 99.97 percent, the efficiency rating of HEPA filters for radioactive particulate removal. At approximately 1 percent of the total project cost, inclusion of the HEPA filtration unit on a $50 million plus facility to provide confinement of airborne radioactive confinement appears to be a reasonable cost to protect the public, workers, and the environment.

DOE Order 458.1, radiation protection of the public and the environment, requires the as low as reasonably achievable (ALARA) process to be applied to the design of facilities that expose to public or the environment to radiation or radioactive material. Obviously, this is ALARA requirement applies to the LLW also. Failure to install a HEPA filtration unit in the LLW exhaust ventilation system would appear to be contrary and inconsistent to the ALARA process and principles. The ALARA process is also a Code of Federal Regulations requirement as defined in 10 CFR 835,

occupational radiation production. Similarly, 10 CFR 830 subpart A, quality assurance requirements, requires the use of sound engineering principles and appropriate standards in the design of nuclear facilities. Elimination of the ASME AG-1 nuclear filtration system from the LLW design would seem to be inconsistent with these CFR requirements.

My recommendation: Consistent with 10 CFR 830 and 835, DOE Order 458.1 and the lessons learned from the WIPP radiological accident, I believe that installation of an ASME AG-1 compliant HEPA filtration unit in the LLW exhaust ventilation system should be considered a reasonably achievable design feature. As such, I ask for your continued support in ensuring that consequences to the public, workers, and the environment from radiological releases from LANL's defense nuclear facilities, including its radiologic nuclear facilities, are kept as low as reasonably achievable.

If you have any questions regarding this concern, please let me know, and thank you.

CHAIRMAN SULLIVAN: And I timed you at 4 minutes and 58 seconds, so you get extra credit. Thank you.

Next on the list, Scott Kovac.

MR. KOVAC: Thank you, Mr. Chair and Member of the Board. My name is Scott Kovac. I'm with Nuclear Watch New Mexico here in Santa Fe. We support safe monitored storage of radioactive waste as a matter of national security and environmental protection. However, this should not be interpreted as support for more nuclear weapons or pit production nuclear power or the generation of more nuclear waste. In our view, the best way to deal with the environmental impacted of nuclear waste is not to produce it to begin with.

I'd like to have -- I have a summary of some of my suggestions here. First off is, any expanded pit production schedule must prioritize health and safety over any hypothesized need for pits.

We should have this hearing again in 2026, when all the buildings and all the remodels of the existing buildings of LANL that support pit production are complete. An active containment -- active confinement ventilation system must be in place and working. Do not make any pits until all the safety programs are approved and operational, and until the vault and all the gloveboxes are de-inventoried.

The time for LANL to get away with "We're working on it" or "We're making the plan" are over. LANL has a long history of not following through on corrective action measures. In addition to this, a new management and operating contractor for LANL will come into place within the next couple years.

We didn't talk about that today, but new organizations will be inherently less safe as they get up to speed.

There are two new radioactive waste facilities: The transuranic liquid waste treatment facility upgrade project and the radioactive liquid waste facility must be completely working before any new pits are made. Additional waste storage at TA-55 must not be allowed.

I do appreciate your work on the active confinement ventilation systems. I looked it up. I went back to July 2005 where the Board -- and this is a quote from one of the weekly reports -- the Board clearly stated its position that a reasonable upgrade of the existing active confinement ventilation system is the preferred safety class alternative. And again in December 2005 where the Board stated the TA-55's dominant nuclear safety issue, which is the open -- which is the still open

question on the effectiveness of the passive confinement strategy.

So it is a shame that these systems or these active confinement ventilation systems are not funded. And so now they've gone back to, like -- here's a report from January 2017, earlier this year, that a -- notable outyear activities include identifying the totally seismic -- identifying the totality of the seismic vulnerabilities that began in 2008 and an effective -- and the active confinement ventilation system.

Back to completing all buildings and programs. There's a couple of things. The PF-4 equipment installation phase 1 sub project, which is, you know, decommissioning and squeezing more capabilities into PF is not scheduled for completion until 2022.

The PF-4 and equipment installation phase 2 project, more of the same, not scheduled to be completed until 2026. These are -- these have to be finished before any pit production is started. The two new radioactive waste facilities, the transuranic liquid waste treatment facility and the radioactive liquid waste facility must be complete before any new bids are made. The transuranic

liquid waste treatment facility upgrade project is due to be completed in 2022.

THE WITNESS: Mr. Kovac, you're at five minutes. If I could ask you to wrap up, please.

MR. KOVAC: Okay. Thank you. The radioactive liquid waste treatment facility is due to be closed in 2018. And I'll just wrap it up by saying, you know, the Laboratory has plans, and as mentioned even earlier today, that the plan to store transuranic waste outside of TA-55, and so we can't allow that either. Thank you.

CHAIRMAN SULLIVAN: Thank you.

The next speaker is George Anastas.

MR. ANASTAS: Good evening. Welcome to New Mexico. My name is George Anastas. I'm a citizen. I'm a professional nuclear engineer registered in the state of California. I want to thank the staff for the report for this particular hearing plus the report that they did, the staff issues paper dated July 2, 2013, "Criticality Safety of Los Alamos." I'm going to address five points this evening, but I will follow up with a written statement for you all.

First of all, I spent several days connecting dots regarding criticality safety at

PF-4. And I started Friday, and I ended up Sunday afternoon just before the basketball game. I threw my hands up in the air. There were too many dots.

One dot -- several dots -- really got me concerned. First of all, fire water intrusion into nonsealed containers would lead to a criticality. And I think the Board can make some recommendations regarding that.

The second item is that a number of personnel violating posted quantities of special nuclear materials on carts and in gloveboxes -- that's a no-no. That's got to be one of the sacrosanct criticality issues that must be taken care of.

The third item. There probably -- this PF-4 is 30 years old. So I'm going to guess there are unknown liquids in discarded process equipment in the facility. I'm concerned about MUF, which is material unaccounted for, in these pieces of equipment.

Additionally, the numbers, the quantities of plutonium-239 are not given with any error bars associated with it. And in my experience in fuel fabrication facilities, you always have an error bar indicating the error in the particular measurement.

So in fact, if you look at material unaccounted for, material in discarded process equipment, there may be more than -- I hate to say this -- 1.8 metric tons of 239 on the first floor. That's a lot of plutonium.

The next item is that Los Alamos makes good statements about the DSA. And I would recommend that someone independently not review the DSA but review the assumptions in the DSA. One of the major problems with DSAs are that the proponent uses annual average meteorology. Well, there's no such thing in the real world as annual average meteorology. You should look at the worst meteorological conditions, the worst Chi over Q in the parlance of meteorologists, and use that in your action evaluation rather than using the average wind speed.

Last item, then I'll shut up. Oh. Mr. Chairman, you made the point: One earthquake in 10,000 years is an attempt using probabilistic risk assessment to say that what happened yesterday should not have happened within the next 10,000 years. PRA just says it's likely or it's unlikely. It can happen today. It can happen tomorrow. And PRA should not be used to provide a false sense of

security, much like what happened at Fukushima with the underwater landslide and the tsunami which hadn't occurred in 10,000 years or a thousand years.

Thank you very much.

CHAIRMAN SULLIVAN: Thank you. That was 4 minutes and 50 seconds. So you're going to give Mr. Fischahs a run for most timely.

Our next speaker is Marissa Naranjo.

MS. NARANJO: Thank you. (Speaking Tewa.) Good afternoon. My name is Marissa Naranjo. I'm a tribal member of Santa Clara Pueblo, co-founder of our Santa Clara Pueblo Youth Council and also a youth representative for the Community for Clean Water.

First, I'd like to say that I'm very disappointed and I think that it's highly disgraceful that the LANL admin that were here today left before hearing all of our concerns and comments, and that it's that lack of personal accountability to the health and safety of our public and surrounding tribal communities that brought me here today to remind you all that we are here on pueblo land.

LANL has only been here for a little over five decades, and now there's an entire economy

built off the exploitation of our people. It's extremely difficult to sit here and listen to LANL explain that the hazard mitigation actions they are taking for the possibility and probability of fires and earthquakes on our ancestral homelands, knowing that there were already over 400 hazard waste violations in 2015 and over 100 in 2016. Every family in our community, my family included, has a member that has passed away as a result of cancer, being exposed to the radionuclides that come from LANL. Both my great-grandma and my grandma died of thyroid cancer.

Our air, water, and soil and our food has been contaminated, and our ancestral lands have been desecrated, and now they're talking about increasing pit production and the possibility of building new facilities.

My greatest fear with regard to this whole issue is that if LANL isn't held accountable and told to stop, that it will expand and who knows -- who knows how much, that another five decades from now another youth from our community will be standing up here trying to advocate for the health of our elders and our entire communities.

So I urge you all just to help hold them

accountable and stop what they're doing to us. We're some of the most vulnerable communities and we don't have very much to stick up for ourselves. So please do what you can to help us.

CHAIRMAN SULLIVAN: Thank you for your comments.

Our next speaker is Anna Hansen.

MS. HANSEN: Good evening, Chairman and Commissioners. Thank you very much for coming to our community. I support everything that has been said so far, and especially for our pueblo brothers and sisters and their land, and especially for LANL leaving and not listening to the comments here.

I am a Santa Fe County Commissioner. I am a member of the Buckman Direct Diversion. I am a former chair of Concerned Citizens for Nuclear Safety from 1999 to 2004. I have a long, long history with LANL. I have lived here for over 45 years. So I have watched what happened to our community for all of that time.

As a county commissioner, my first concern is for our water and our people and being contaminated. LANL continually denies that there is poison in our water. I am concerned. That is a very real issue to me, plutonium in the Rio Grande.

And even though it is a heavy metal and it falls to the bottom and we have created the diversion plant and the diversion where we can stop the water coming in, there are still contaminants constantly coming off of that mountain, not to mention the chromium plume that is not cleaned up that is approaching San Ildefonso Pueblo land, probably has already moved onto it.

So we have numerous, numerous issues that need to be addressed. Why -- why -- are we building a Plutonium Facility, another one -- and we should stop now -- on a mesa on the edge of a canyon with seismic and fire everywhere. This is like -- does not make sense in any logical person's mind to have a Plutonium Facility that is in a place where there is known fire and known earthquakes.

So as an elected official and as a member of the Santa Fe County Commission and that my county borders LANL, I would request that you connect and talk to us more often. I have left my card with the people at the front desk.

We want to be informed. I am grateful that you are here. You have at least addressed some of the issues that have happened in the last 40 years up there and have begun to make it a safer

facility, but it's still not safe. When they talk about "It's safe," those are words. Those are not actions. And what I want are actions. I want to know that when a worker is -- on April 19 a fire broke out in the Plutonium Facility. Three workers placed the containment of unlabeled waste containers into plastic bags. The mixture contained piles -- materials that spontaneously ignited when exposed to air, a fire ensued, one worker received second-degree burns in both hands after placing the bag into a metal container located on a metal cart. He pushed the cart towards the front of the room away from the gloveboxes where the plutonium is handled and snuffed out the fire with a hand-held fire extinguisher. You know that.

But there have been other incidences that are not reported. And I can list them if you would like, but I'm sure that you know that because I am taking some of this stuff from your site.

So we have growing concerns, you know. Their basic chemistry at LANL -- the consequences, you know, with the fire and other issues.

I am also concerned about Highway 599, which is the route -- WIPP route through our community. That now has become populated with

people because that's not advertised as a nuclear highway, and that's what it was built for, and it was built to take waste off of the mountain, and it needs to be protected. And that route was built by you, or the federal government, to protect us as citizens, and now development is continuing to happen there because the perfect opportunity without that being acknowledged. And I want that acknowledged. I want that information made aware. And as waste comes off of the mountain and off of the hill and along that highway, I want those drivers to be certified. I want them to be, you know, the highest quality and training.

CHAIRMAN SULLIVAN: Excuse me.

MS. HANSEN: You're talking -- okay. I'm sorry.

CHAIRMAN SULLIVAN: You're over five minutes and so if you could please --

MS. HANSEN: Okay. I thank you. But I think I made a number of my points, and I will try and get this into writing. But I really appreciate you being here, and thank you so much for listening to all of us and hearing our concerns. Thank you.

CHAIRMAN SULLIVAN: Thank you.

All right. The final person who is on our

signup list is Janet Greenwald.

MS. GREENWALD: Hi. I'm Janet Greenwald, and I am co-coordinator for Citizens for Alternatives to Radioactive Dumping, or CARD. It was a very old group that was founded in 1978. It's a grass roots group. It's statewide.

In Albuquerque now we're drinking quite a bit of plutonium. It's below regulatory concern, but it's above the amounts that are recommended by progressive physicists for the pregnant woman and the young child.

My husband and I belong to the Heron Lake Sailing Club, and one of the co-members there was a man whose whole job was to trace the plutonium that comes from Los Alamos and enters the river, the Rio Grande. And he told us that not to worry because most of it precipitates out in Cochiti Lake, but there's no warning in Cochiti Lake. I hear people say all the time, "I'm going sailing there. I'm going fishing there, I'm going..." I don't know. It's -- our whole state is a case of environmental injustice when it comes to the nuclear industry. I raised my children in Dixon, New Mexico, which is directly downwind from Los Alamos. After the Cerro Grande fire, the New Mexico Environment Department

came and said, "There is cobalt in your plums and there is CCM in your broccoli, but not to worry because on the national average, you won't get enough to cause contamination." But you know, when you're living in the country and your broccoli comes in, you don't eat the average amount that the American -- average American eats every week. You eat tons of broccoli. And shortly after -- a couple of years after the Cerro Grande fire, one of my friends in Dixon died of cancer, and she was a vegetarian that only ate out of her garden. And now in the valley above there and Ojo Sarco, I have a young friend who's suffering from a nerve disease that sounds very like nerve diseases that I've run into, workers in Rocky Flats, you know. There were more nerve diseases among Rocky Flats workers than there was cancer, even though there was lots of both.

Up above Dixon in Ojo Sarco and the community above that, La Joya, there's a large number of cancers, and there's a man up there who's documenting them. He tells me that one out of every seven people now is dying of cancer up there.

Also the mountain lake up there has so much cesium around it that it's on the border of

being an EPA site. We don't know that that cesium came from Los Alamos because you can't fingerprint cesium, but it seems kind of obvious. Those lakes are directly downwind from Los Alamos and just a little above the elevation of Los Alamos.

So also Dixon and that area is considered the organic farms of choice in New Mexico, the organic bread basket, you could say.

So my request is: Different citizens groups have tried to do monitoring in both Ojo Sarco and Dixon, and they just didn't have everything it took. And I feel that if there was some funding for monitoring in these downwind communities or down-gradient communities like Santa Clara, that people might be able to sleep more easily at night. I'm constantly fearful for my grandchildren and my children, who live in that area that I know has been contaminated. I mean, our environment department admitted it to us.

I want to thank you for being concerned about our safety here in New Mexico. Obviously very little concern from the federal government. And as I say, I think the whole state at this point is an environmental justice area. And if there is any environmental justice, I'm hoping that someone will

note that. Thank you very much.

CHAIRMAN SULLIVAN: All right. Thank you.

So that completes the list of speakers who signed up. Is there anyone else in the room who has not spoken yet who would like the opportunity to speak? I see a hand over here and another one over there. So if I can ask those individuals -- first this woman on the left, and then the gentleman on the right.

Please identify yourself and I ask you to keep your remarks to five minutes.

MS. SANCHEZ: Okay. Give me a thumb when it's time. My name is Kathy Wan Povi Sanchez. I'm from San Ildefonso Pueblo. I'm not speaking for the pueblo, but I am an employee of Tewa Women United, and I was going to submit a written comment but then I'm compelled to just speak now, too, as well, because we are the most earth-impacted because Los Alamos was flopped into our sacred lands and I would like to note that Los Alamos sits on Jemez Plateau, which is at the rim of a dormant volcano and I think it's just crazy that the continuation of a nuclear pit production facility sits on the rim of a dormant volcano because there's still geothermal activities happening there and because the Storage

Area G has been located there since the onset that the contamination has seeped into our aquifer, and so there is a plume there and alongside the other area, and they're going to probably merge our -- probably already have -- is the chromium plume that is in the other canyon area. And in order to mitigate that, the intelligence of the lab is saying that they're going to frack the water out from there, meaning there's going to be active movement of supposedly taking out the upper layer of contaminated water and then clear -- cleansing it or cleaning it up enough to land applications of it or either put it back into it, meaning that if nothing happens that is not connected to any other activities, meaning that if there's active movement of water that is being sucked out and sucked back in, you're creating a movement and if you have seismic activities, you're already setting up the active vulnerability of tufa, which the plateau is mainly made out of, of concentrated ash from the volcanic activity. So you're not sitting on solid dirt. You're sitting on very porous material of ancient volcanic ash and wood burning.

And I have lived up in the pueblo all my life and I've seen two drastic fires that have come

into the boundaries and my question was that our native firefighters were the ones that have -- the other firefighters pulled out of there because they knew the contamination of the fires was different. It had a lot of nuclear pollution materials in that fire and it was glowing differently and it heats up differently. So they left and our native firefighters stayed.

So then my question was: Well, doesn't the Lab even have its own firefighters? No. It's the State and it's the -- that is furnishing the firefighters, and they're volunteer. Because of those fires were being fought for the Lab and the Lab wasn't permitting them to come onto the facility, there was at that very moment of that fear and trauma that we faced that we could have had a nuclear catastrophe just there within two fires.

And so I think the safety of the people, the vulnerability, also plays on the environmental justice of that trauma, trauma that we're fearful, trauma that something is going to happen because there's human miscalculations, mishandling, inappropriate follow-through. The reports I've been watching and receiving is that it's a lot of paperwork, it's a lot of safety on paper, but

action -- what is actually the follow-through that they've done something about it? I haven't seen anything that says this was corrected by this action. It was corrected on paper but still implementation has not been coming forward.

So fire, the water, the contamination. Our people, our health. There's no -- another -- usually a tie-in from issues with the Lab and issues of the health impacts. I think they should both be connected because once you can fingerprint the source of the contaminants, they are the ones that generate it, should be accountable for its cleanup. And a cleanup budget was cut, but the ramp up of the production to 80 pits -- that's insane. I think that's crazy when you have only six and eight, and now they're saying, "Oh, we can handle 20. Oh, we can handle 30. Oh, we can handle 80." Money, money, money to produce, but not to clean up, not to demand that accountability.

So I thank you for being a Board that is about accountability. Thank you. Good night.

CHAIRMAN SULLIVAN: Thank you.

The gentleman over here on the other side of the room.

MR. MAGGIORE: Thank you. My name's

Antonio Maggiore. I am a county counselor in Los Alamos. However, I'm not speaking here in my official capacity. I want that to be crystal-clear. As I've sat and listened to all of this and it's our -- closer to the mic.

The one thing that really --

SPEAKER FROM THE FLOOR: Closer to the mic. Speak into the mic so we can hear you.

MR. MAGGIORE: I am speaking into the mic.

The one thing that really becomes crystal-clear here is any action that you guys choose to take has to be properly and fully funded. Safety, security, all of these things do not come on the cheap, and I just encourage any decisions to be made, that are made, that they be backed with full and complete, sufficient funding. You can't build safe facilities on the cheap. You can't do cleanup on the cheap. And budgets seem to always continually get cut or shortened or shrunk, and you try to work under a continuing resolution, and adequate funding is a must, not just for the lab but for the safety of all of our surrounding communities.

And as someone who represents Los Alamos, being able to look my fellow citizens, my fellow

elected officials from the neighboring communities -- being able to look them in the eye and know that I can be as direct and forthright and honest with them in saying, "We are doing what we can at a local level," but that means nothing if the backing and the support is not there at the federal level. So whatever you do, fund it fully. Thank you.

CHAIRMAN SULLIVAN: Thank you. All right. Is there anyone else in the room who has not had an opportunity to speak who would like to say -- get up and address the Board?

All right. At this time, it's -- the clock is 9:31 and we had allotted until 9:35, so we do actually have a couple of extra minutes if somebody wanted to step up again. Is there somebody who wants to do that? I see Mr. Mello does. Anybody else?

Mr. Mello, I'll give you four extra minutes.

MR. MELLO: Thank you very much. I want to pick up where I left off.

The problems of safety at Los Alamos are not going to be resolved permanently or successfully without addressing the excessive scale, complexity,

opacity, and confusion. These are what trips up even the best managers in a situation. You could say that Los Alamos plutonium programs are ill from obesity-related diseases. It's not the fault of the existing managers entirely. It's a genetic defect that comes with the mission.

Now, we heard reasons why the PF-4 hazard mitigation has been slow and they basically all were related to other LANL mismanagement issues. We have the WIPP problem, which was created by Los Alamos.

We have a Transuranic Waste Facility, which was very long in coming and now has these serious problems which Mr. Santos brought up.

We have the radioactive liquid waste treatment facility, which is a saga that goes way back into the 1990s where designs were pursued to the 90 percent level and then stopped by DOE and then redesigned again.

We have the radioactive laboratory utility and office building. The budget for that is now $1.4 billion, way more in the cost of dollars than the Golden Gate Bridge.

We've got the criticality problems which continue which hold things back.

We have the original vault design of PF-4,

which there was a criticality calculation that was an error. There was the earthquake analysis that was used. Weston, I guess, I guess, was it? Anyway, it was substandard by the standards of the time and now it's easy to look back and say, "Oh, well, that was inadequate then." It was inadequate when it was first done.

We have the CMRR nuclear facility which was a $500 million waste of money and a decade. We have the CMR facility. They promised you they would be out of that by 2010. Then they promised by 2019. And now if you look in the details of the president's budget, it's pushed way out farther. And I'm sorry, I'm not remembering the exact date but it's way beyond 2021.

The plutonium storage facility was built and torn down. There was a vault built. Then when -- it was built for about $20 million. The upgrade was going to cost more than $100 million. So they eventually quietly bulldozed that.

So there's a high level of institutional incompetence and the contractor is paid for this; in fact, paid more for the mistakes. This is a hard problem, and so there's -- and if you look at what the actual product coming out of Los Alamos is and

divide it by the money going in, compared to the Cold War, you've got, you know, a factor of 20 or so times. Reporters do this, senior managers at other facilities have joked about it. In fact, they say don't divide by zero because you can't do that operation.

CHAIRMAN SULLIVAN: Mr. Mello, we are out of time.

MR. MELLO: I appreciate your patience. Thank you very much, and I appreciate your longstanding work to try to make this safe. Thank you.

CHAIRMAN SULLIVAN: Okay. Thank you.

So at this time we will have closing remarks of Board members. I will start with some remarks for my own in my capacity as an individual Board member and I'll turn to the other Board members, and then I have administrative comments at the end on behalf of the Board.

So we heard a lot of information tonight about what is a complex problem involving the Plutonium Facility. There's a lot of factors that NNSA has to take into account in order to try to manage the issues that were discussed here. And I don't mean to imply that I could do a better job if

I was sitting in their shoes. Nevertheless, we are talking about a facility that is almost 40 years old and has an indefinite future life. There are some systems that have deficiencies. Some systems have parts that are obsolete. There was a previous plan to design and build a replacement facility. That fell apart. And the next plan to build any new addition is several years away.

Now, they have problems disposing of material in the building, and all of this occurs at a time when the programmatic mission work is slated to begin to increase significantly. So there is concern, and it is because of that concern that I came here tonight seeking answers to some questions, and I was appreciative of the fact that NNSA and the Laboratory management here for the contractor did address the questions, and I also appreciated the information provided by the public. And I will take all that back with me as we try to plot a path forward at the Defense Board.

So that concludes my remarks.

Mr. Hamilton, do you have any closing remarks?

MR. HAMILTON: Thank you, Mr. Chairman. I don't have any additional remarks.

CHAIRMAN SULLIVAN: Mr. Santos?

MR. SANTOS: No additional remarks, Mr. Chairman.

CHAIRMAN SULLIVAN: Ms. Connery?

MS. CONNERY: No additional remarks at this time. Thank you.

CHAIRMAN SULLIVAN: Thank you. I'd like to thank all the persons who were here, including the public and the organizations who supported this hearing. Our goal for the hearing was to gather information regarding the National Nuclear Security Administration strategy to ensure the hazard to the public and workers posed by storage and processing of special nuclear materials within the Plutonium Facility is safely managed now and into the future.

Tonight we heard testimony from NNSA and the Laboratory leadership team, as well as comments from the public. The Board will consider the information gathered this evening to inform any actions that we may take regarding these issues.

Once again, I thank everyone for their participation at this hearing. The record of this hearing will remain open until July 7, 2017. So members of the public who wish to submit further comments may do so until then.

I'd like to reiterate that the Board

reserves its right to further schedule and regulate the course of this public hearing to recess, reconvene, postpone, or adjourn this public hearing, or to otherwise exercise its authority under the Atomic Energy Act of 1954 as amended.

This concludes the public hearing of the Defense Nuclear Facility Safety Board, and we are adjourned. Thank you.

(The hearing concluded at 9:39 p.m.)

STATE OF NEW MEXICO
ss
COUNTY OF SANTA FE

REPORTER'S CERTIFICATE

I, STEPHANIE SLONE, New Mexico Certified Shorthand Reporter, do hereby certify that I did report in stenographic shorthand the proceedings set forth herein.

I, MARY ABERNATHY SEAL, do hereby certify that the foregoing is a true and correct transcription of said proceedings to the best of my ability.

I further certify that I am neither employed by nor related to any of the parties or entities in this matter and that I have no interest whatsoever in the final disposition of this proceeding in any court.

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