

**In the Matter of:**

**Defense Nuclear Facilities Safety Board**

*June 20, 2019  
Public Hearing*

**Condensed Transcript with Word Index**



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6 DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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10 PUBLIC HEARING ON SAFETY MANAGEMENT

11 OF WASTE STORAGE AND PROCESSING

12 IN THE DEFENSE NUCLEAR FACILITIES COMPLEX

13

14

15 Thursday, June 20, 2019

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18 625 Indiana Avenue, N.W.

19 Washington, D.C. 20004

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1 A P P E A R A N C E S

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3 DEFENSE NUCLEAR FACILITIES SAFETY BOARD:

4 BRUCE HAMILTON, Vice Chairman

5 JESSIE H. ROBERSON, Board Member

6 JOYCE L. CONNERY, Board Member

7 CASEY BLAINE, Acting General Counsel

8 CHRISTOPHER ROSCETTI, Technical Director

9

10 DEPARTMENT OF ENERGY:

11 TODD SHRADER, Principal Deputy Assistant

12 Secretary, Office of Environmental Management

13 JEFFREY GRIFFIN, Associate Principal Deputy

14 Assistant Secretary for Field Operations,

15 Office of Environmental Management

16 DAE CHUNG, Deputy Assistant Secretary for

17 Safety, Security and Quality Assurance,

18 Office of Environmental Management

19

20 NATIONAL SECURITY SAFETY ADMINISTRATION:

21 TED WYKA, Principal Deputy Associate

22 Administrator for Safety, Infrastructure and

23 Operations

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1 P R O C E E D I N G S

2 - - - - -

3 CHAIRMAN HAMILTON: Good afternoon, everyone.

4 My name is Bruce Hamilton and I'm the Chairman of the

5 Defense Nuclear Facilities Safety Board. I will Preside

6 over today's hearing.

7 I now call this hearing into order. I would

8 like to introduce my colleagues on the Board. To my

9 right is Board Member Jessie Roberson; to my left, Board

10 Member Joyce Connery. We three constitute the Board.

11 The Board's acting general counsel, Ms. Casey

12 Blaine, is seated to my far right. Several members of

13 our staff closely involved with the oversight of the

14 Department of Energy's Defense Nuclear Facilities are

15 also here.

16 The purpose of this hearing is to understand DOE

17 actions to strengthen the safety posture of solid waste

18 operations and to gather information on safety controls

19 to address the vulnerabilities associated with handling

20 and processing solid nuclear waste at Defense Nuclear

21 Facilities.

22 In the first session, we will hear testimony

23 from current Principal Deputy Assistant Secretary for

24 the Office of Environmental Management; Environmental

25 Management Associate Principal Deputy Assistant

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1 Secretary for Field Operations; the EM Deputy Assistant  
 2 of Secretary for Safety, Security and Quality Assurance;  
 3 and the Principal Deputy Associate Administrator for  
 4 Safety, Infrastructure and Operations in the National  
 5 Nuclear Security Administration.  
 6 In addition, we will also hear from our  
 7 Technical Director here at the Board. Finally, Mr. Paul  
 8 Dabbar, the Under Secretary for Science, will provide us  
 9 with a written statement for the hearing record  
 10 following today's proceedings.  
 11 The purpose of our first session is to discuss  
 12 the DOE's actions to strengthen the safety posture of  
 13 solid nuclear waste operations. Two recent events have  
 14 highlighted the need for the Department and the Board to  
 15 examine safety aspects of the storage and processing of  
 16 solid nuclear wastes. They are the February 2014  
 17 radiological release event at the Waste Isolation Pilot  
 18 Plant near Carlsbad, New Mexico, and the April 2018  
 19 overpressurization and subsequent radiological release  
 20 from four drums at the Idaho National Laboratory near  
 21 Idaho Falls, Idaho.  
 22 These two events show that chemical reactions in  
 23 the waste can lead to releases of radioactive material,  
 24 both where the waste is generated and where it is  
 25 disposed. Accordingly, today's discussion is going to

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1 focus on the hazards posed by this undesired chemical  
 2 reactions.  
 3 For context, in both the WIPP and Idaho events,  
 4 the radiological consequences to human populations were  
 5 inconsequential. The DOE investigation into the WIPP  
 6 event described intakes of radiological materials by  
 7 personnel as low level, with trace amounts of  
 8 radiological contamination detected off site.  
 9 However, under other circumstances, exposures to  
 10 personnel could have been more significant and there are  
 11 lessons that can be learned from these two events.  
 12 Today we are discussing solid nuclear waste, both those  
 13 that are newly generated as part of the Department's  
 14 ongoing national security activities, as well as those  
 15 that were generated in the past and are commonly  
 16 referred to as legacy wastes.  
 17 We will focus on solid transuranic wastes, those  
 18 that contain greater than a statutorily defined  
 19 concentration of certain radio nuclides; however, some  
 20 of the discussions will also be applicable to low-level  
 21 waste. High-level waste and used fuel are outside the  
 22 scope of today's hearing.  
 23 Today's hearing was publicly announced on April  
 24 24th on the Board's public website and subsequently  
 25 noticed in the Federal Register on June 17th. In order

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1 to ensure accurate and timely information for the  
 2 public, this hearing is being recorded through verbatim  
 3 transcript, video recording and live video streaming.  
 4 The transcript, associated documents, public notice and  
 5 video recording will be available for viewing at our  
 6 public website. The video recording will be available  
 7 through our website for at least 60 days.  
 8 Per the Board's practice, and as stated in the  
 9 agenda, we will welcome comments from interested members  
 10 of the public at approximately 3:30 this afternoon. A  
 11 list of speakers who have contacted us is posted at the  
 12 entrance to the room. We have generally listed the  
 13 speakers in the order in which they contacted us, or if  
 14 possible, when they wished to speak.  
 15 Ms. Blaine will call the speakers in this order  
 16 and ask that the speakers state their name and  
 17 organization, if any, at the beginning of the  
 18 presentations. There's also a table at the entrance to  
 19 the room with a sign-up sheet for members of the public  
 20 who wish to provide comment, but who did not have the  
 21 opportunity to notify us ahead of time. They will  
 22 follow those who have already registered. We ask the  
 23 speakers to limit their comments to five minutes in  
 24 order to give everyone an opportunity to speak.  
 25 Information should be limited to comments,

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1 technical information or data concerning the subjects of  
 2 this hearing. Board members may question anyone who  
 3 provides comments to the extent deemed appropriate.  
 4 The record of this hearing will remain open  
 5 until July 20th, and until that date, members of the  
 6 public, including those observing today's hearing live  
 7 via video streaming, may submit written statements to  
 8 the Board to be included in the record. Contact  
 9 information for submitting that statement is available  
 10 on our website.  
 11 We reserve the right to further reschedule and  
 12 regulate the course of this hearing, to recess,  
 13 reconvene, postpone or adjourn this proceeding and  
 14 otherwise to exercise our authority under the Atomic  
 15 Energy Act, as amended.  
 16 This concludes my opening remarks. I will now  
 17 turn to my fellow Board members for their opening  
 18 remarks.  
 19 Ms. Roberson?  
 20 BOARD MEMBER ROBERSON: I do not have an opening  
 21 statement. Thank you, Mr. Chairman.  
 22 CHAIRMAN HAMILTON: Ms. Connery?  
 23 BOARD MEMBER CONNERY: Good afternoon. I would  
 24 like to start by thanking our witnesses from the  
 25 Department of Energy for joining us today to discuss the

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1 safety management of waste storage and processing. I  
 2 appreciate you taking the time from your busy schedules  
 3 to talk to us about our concerns, and to the public.  
 4 From the public and anybody observing from Capitol Hill  
 5 and the press, we do appreciate you taking interest in  
 6 the safety of the complex and our work here at the  
 7 Board. And finally, I would like to publicly  
 8 acknowledge the work of our staff, our management staff,  
 9 our legal staff and our technical staff who put in many  
 10 hours of work in preparing for this hearing.  
 11 As is known from public correspondence with the  
 12 Department, the Board was troubled by the events that  
 13 took place on April 11th, 2018, in Idaho, with what  
 14 we'll call an overpressurization event. Four drums  
 15 energetically ejected their lids and spewed radiological  
 16 waste throughout a facility. Luckily no one was in the  
 17 facility at the time, sparing injury, or worse.  
 18 The fire department reacted, and while we aren't  
 19 delving into those facts today, took some questionable  
 20 actions, but again, were not harmed during the course of  
 21 the event.  
 22 Since the event, the contractor at Idaho has  
 23 been diligently, and appropriately, decontaminating the  
 24 facility, investigating the event, and has even resumed  
 25 waste processing of the material that was collocated

10

1 with the drums that erupted.  
 2 The Department declined a Federal investigation  
 3 and opted for the contractor to conduct its own  
 4 investigation. Root causes of the event were examined  
 5 and a hypothesis was laid out by the contractor as to  
 6 the cause of the event. The event itself was not  
 7 incredible, yet it was also not predicted, analyzed or  
 8 controlled for.  
 9 In February 2014, a drum within the Waste  
 10 Isolation Pilot Program also erupted and ejected  
 11 material and contaminated the single waste facility in  
 12 the complex that was certified to permanently dispose of  
 13 transuranic waste, closing that facility for nearly  
 14 three years and costing hundreds of millions of dollars.  
 15 There is waste throughout the DOE complex, some  
 16 of it newly generated, some of it dating back to before  
 17 I was born. Some of that waste is well characterized,  
 18 predictable and safely stored. A lot of that waste is  
 19 being dug up because it was improperly disposed of, is  
 20 not well characterized, and will need to be retreated  
 21 and/or repackaged before it reaches its final  
 22 disposition, whether that be at WIPP or some place.  
 23 Following the WIPP accident, there was a Federal  
 24 investigation, lessons learned were promulgated and  
 25 corrective actions taken. The whole complex was alerted

11

1 to the event, and presumably precautions were taken to  
 2 avoid a repeat event based on the information that was  
 3 gleaned from that accident.  
 4 So this leads us to some very logical questions,  
 5 and these are the questions we would like to explore  
 6 during this hearing. What was not done post-WIPP that  
 7 could have predicted, prevented or mitigated the events  
 8 at Idaho, if anything. Why is it determined that a  
 9 Federal investigation was needed at WIPP but not at  
 10 Idaho?  
 11 In May of this year, over a year after the Idaho  
 12 event, DOE's Environmental Management Office issued a  
 13 safety alert to garner information from across the  
 14 environmental management site, this is what we call an  
 15 extent of condition, to determine how sites assess and  
 16 control risks from radioactive drums with uncertain or  
 17 unknown waste streams in their Documented Safety  
 18 Analysis.  
 19 While this safety alert is consistent with the  
 20 information that we, the Board, requested from the  
 21 Department, why didn't the Department initiate this  
 22 request for information itself and in a more timely  
 23 manner?  
 24 The safety alert only pertained to environmental  
 25 management sites. Why wasn't the Department Corporate

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1 Operational Experience Program used in order to assess  
 2 the risk across the whole enterprise? Are there other  
 3 drums subject to chemical reaction events either through  
 4 postulated mechanisms of the Idaho event, or through  
 5 some other confluence of circumstances?  
 6 Are there other drums stored at waste generator  
 7 sites that could undergo a chemical reaction with  
 8 similar effects, and if so, are those drums in a safe  
 9 storage configuration? Are they safe during processing?  
 10 Are there sufficient controls to prevent, detect or  
 11 mitigate future accidents?  
 12 Is the Department consistent in applying its  
 13 standards across the complex to ensure that the workers  
 14 and public are safe? And lastly, the standard itself,  
 15 5506, which the Department has been talking about  
 16 updating since 2015, is that sufficient to protect the  
 17 sites that are processing and storing waste?  
 18 It's important that the Department maintains  
 19 consistency of approach, be predictive in its analysis  
 20 of hazards, versus reactive to the last challenge it  
 21 faced, and be transparent about the areas in which  
 22 improvements can be made. I'm hoping that we can have a  
 23 good dialog through this hearing to get a better  
 24 understanding of how the Department sees these events,  
 25 and perhaps even ask questions that you will find useful

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1 as you develop your path forward on revising your  
2 standard, communicating your expectations for  
3 implementation, and engage in your mandatory regulatory  
4 and oversight role.

5 I would note that this hearing -- we had some  
6 timing difficulties, and I want to apologize to the  
7 folks in Idaho. I realize that there's a concurrent  
8 meeting of the Idaho Cleanup Project Citizens Advisory  
9 Board and they expressed concern about the timing of the  
10 hearing. So I apologize that we could not have done it  
11 at a more convenient time for them, but we look forward  
12 to any interaction that they would like to have with the  
13 Board.

14 That concludes my opening remarks.

15 CHAIRMAN HAMILTON: Thank you, Board Member  
16 Connery.

17 At this time, I would like to introduce the  
18 panel itself. Todd Shrader is the Principal Deputy  
19 Assistant Secretary in the Office of Environmental  
20 Management; Jeffrey Griffin is the Associate Principal  
21 Deputy Assistant Secretary for Field Operations in the  
22 Office of Environmental Management; Dae Chung is the  
23 Deputy Assistant Secretary for Safety, Security and  
24 Quality Assurance in the Office of Environmental  
25 Management; and Mr. Ted Wyka is the Principal Deputy

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1 Associate Administrator for Safety, Infrastructure and  
2 Operations for the National Nuclear Security  
3 Administration. So welcome all for you of you thank you  
4 for appearing here today.

5 Also on the panel is our Technical Director,  
6 Mr. Christopher Roscetti. And we are pleased to have  
7 all of you here today.

8 I'm going to start the series of questions with  
9 Mr. Roscetti, our Technical Director. Mr. Roscetti, we  
10 understand that both the February 2014 radiological  
11 release at WIPP and the April 2018 overpressurization  
12 and subsequent radiological release at Idaho National  
13 Lab involved chemical reactions in solid wastes. Would  
14 you briefly describe the significance of those events  
15 for us.

16 (Exhibit Number 1 was entered into the record.)

17 MR. ROSCETTI: Yes, sir. I would like to enter  
18 Exhibit 1 into the record. Exhibit 1 shows photographs  
19 following the 2014 WIPP event, and the 2018 Idaho event.  
20 Both events involve the rupture of waste drums and the  
21 release of radiological material from those waste drums.  
22 The picture on the left shows the ruptured drum at WIPP.  
23 The pictures on the right shows two of the four drums  
24 that ruptured at Idaho's Accelerated Retrieval Project.  
25 Exhibit 1 shows that the contents of the drums

Exhibit 1 shows that the contents of the drums

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1 at WIPP and Idaho are spread around the areas  
2 surrounding the drums. In addition, the lids from the  
3 Idaho drums have been ejected. Both events had an  
4 impact on the Department's cleanup mission.

5 Although the actual radiological consequences to  
6 the people were limited in both events, this is only  
7 because of when the drums ruptured. Given other  
8 circumstances, exposures to personnel could have been  
9 more significant, and there are lessons that can be  
10 learned from these two events to help prevent future  
11 occurrences.

12 For example, the WIPP event occurred when normal  
13 work was not being performed due to the February 5th,  
14 2014 salt haul truck fire. In addition, the Idaho event  
15 occurred at night, when no workers were present. If  
16 workers had been present during either of these release  
17 events, there would have been more potential for worker  
18 exposures.

19 In short, no one experienced significant  
20 exposures as a result of either the WIPP or the Idaho  
21 drum ruptures, but both events have affected the  
22 Department's cleanup mission.

23 CHAIRMAN HAMILTON: Am I correct that that  
24 photograph on the left, what looks like a big layer of  
25 detritus, is not from the container? What is that that

16

1 I'm looking at there?

2 MR. ROSCETTI: Yes, sir. This is one I will  
3 have to clarify through the record, but my recollection  
4 at WIPP is that they placed a large bag over the  
5 configuration of the drums and waste boxes stored at  
6 WIPP. The drums are stored in like a 6x6 or a 6x3  
7 array, so there's about six drums and this bag fits on  
8 top of those six drums. And I forget what the contents  
9 of that bag is.

10 CHAIRMAN HAMILTON: Okay, I just wanted to make  
11 sure that nobody thought that that material was what was  
12 ejected from the drum.

13 MR. ROSCETTI: Right. Not all of that material  
14 in the picture on the left is from the drum. It's from  
15 the bag that's used on top of the drums throughout the  
16 mine to I believe suppress -- potentially suppress  
17 fires, but I will clarify that for the record.

18 CHAIRMAN HAMILTON: We can clarify that later.  
19 Will you describe the solid wastes that we're discussing  
20 today, please.

21 MR. ROSCETTI: Yes, sir. Both the WIPP and  
22 Idaho drum ruptures involved solid nuclear wastes. So  
23 these wastes exist in a wide variety of forms. They  
24 include sludges, surplus uranium and plutonium and other  
25 contaminated materials such as contaminated wipes, rags,

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1 filters, soils or equipment.  
 2 Some of the Department's sites store legacy  
 3 wastes that were generated decades ago. Other sites  
 4 continue to generate these same sort of waste materials  
 5 as part of their ongoing missions. Both types of sites  
 6 are commonly referred to as generator sites.  
 7 Some of the solid nuclear wastes will be  
 8 categorized as transuranic, or TRU, wastes. Other solid  
 9 nuclear wastes will be designated as low-level wastes.  
 10 The plan is for generator sites to ultimately ship their  
 11 TRU wastes to WIPP for permanent disposal in the  
 12 geological repository.  
 13 (Exhibit Number 2 was entered into the record.)  
 14 MR. ROSCETTI: I would like to enter Exhibit 2  
 15 into the record. Exhibit 2 provides an overview of the  
 16 scale of the Department's solid waste mission. The  
 17 first slide of Exhibit 2 describes the progress Idaho  
 18 has made shipping waste to WIPP, processing waste, and  
 19 certifying waste for WIPP. It also shows the amount of  
 20 waste remaining to be exhumed and processed.  
 21 Of the legacy TRU waste and low-level waste,  
 22 about 86 percent has already been shipped to disposal  
 23 sites such as WIPP. About 11 percent needs further  
 24 processing or analysis before it can be certified for  
 25 shipment. To help visualize some of these numbers, the

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1 9,700 cubic meters of waste, which are the two center  
 2 rows combined, currently above ground at Idaho is  
 3 equivalent to about 40,000 mostly 55-gallon drums.  
 4 The second slide of Exhibit 2 shows the amount  
 5 of current and future TRU waste at other DOE sites.  
 6 While the Department is making progress, the solid waste  
 7 mission will continue for years.  
 8 CHAIRMAN HAMILTON: Thank you, Mr. Roscetti.  
 9 Ms. Roberson?  
 10 MR. GRIFFIN: Mr. Chairman, yes, I am sorry, I  
 11 would like or we would like to make some opening remarks  
 12 if that's possible before we enter the discussion.  
 13 CHAIRMAN HAMILTON: You know, it is, and I think  
 14 I may have skipped over that. Let me see. Is that in  
 15 here?  
 16 BOARD MEMBER CONNERY: They said they weren't  
 17 going to.  
 18 CHAIRMAN HAMILTON: Okay, go ahead and make your  
 19 opening remarks. I didn't believe -- the information we  
 20 got was that you didn't have any, but since you do, go  
 21 ahead.  
 22 MR. GRIFFIN: Thank you very much.  
 23 So, good afternoon. I am Jeff Griffin,  
 24 Associate Principal Deputy Assistant Secretary for Field  
 25 Operations in the Office of Environmental Management,

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1 and on behalf of the Department of Energy, I welcome and  
 2 we all welcome the opportunity to provide opening  
 3 remarks today for this session in today's public hearing  
 4 on safety management of waste storage and processing in  
 5 the Defense Nuclear Facilities Complex.  
 6 I want to thank the Board for the opportunity  
 7 for open and transparent discussions, recognizing the  
 8 topics we'll be discussing today are mutual importance  
 9 to DOE, DNFSB and our stakeholders. I would like to  
 10 introduce the others, and this will be for both panels.  
 11 Starting with Mr. Todd Shrader, and although  
 12 while he was recently appointed Principal Deputy  
 13 Assistant Secretary for Environmental Management, today  
 14 he will be representing his former position as manager  
 15 of the Carlsbad Field Office, which is responsible for  
 16 the actual Transuranic Waste Program.  
 17 Also participating in the panel are Mr. Jack  
 18 Zimmerman, deputy manager for the Idaho cleanup project;  
 19 Mr. Dae Chung, Deputy Assistant Secretary for Safety  
 20 Security, Quality Assurance; and Mr. Ted Wyka, Principal  
 21 Deputy Associate Administrator for Safety Infrastructure  
 22 and Operations for the National Nuclear Security  
 23 Administration.  
 24 We look forward to a constructive dialogue with  
 25 the Board that can provide a clear understanding of the

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1 actions and intent of the Department of Energy as they  
 2 relate to waste storage and processing throughout the  
 3 DOE enterprise. The safety of our workers, the public  
 4 and environment is always our top priority. We  
 5 recognize the work we do is hazardous and the  
 6 implementation of the proper controls is critical to the  
 7 safe operations and adequate protection of public health  
 8 and safety.  
 9 A common theme for today's discussions is the  
 10 potential for chemical reactions with some of our waste.  
 11 We specifically discussed in the event last year at the  
 12 Idaho Accelerated Retrieval Project, or ARP, and the  
 13 2014 event that led to a release at the Waste Isolation  
 14 Pilot Plant, or WIPP.  
 15 We fully understand the root cause of both the  
 16 WIPP and ARP issues, and the event leading to the 2014  
 17 release at the WIPP, the reactive nature of the waste  
 18 was directly DUE to the use of incorrect materials and  
 19 the processing of the well-known waste stream. The root  
 20 cause corrective actions for the WIPP event are designed  
 21 to prevent a similar adverse effect on WIPP, and from  
 22 that standpoint have been highly effective.  
 23 The more recent ARP event is different in that  
 24 it involved legacy waste that was processed without  
 25 detailed knowledge of its contents. In fact, in this

21

1 case, the waste was under audio/visual examination in an  
2 effort to aid in the characterization of the waste as  
3 one of the first steps leading to eventual certification  
4 for transport to WIPP.

5 The wastes in question processed at ARP had not  
6 yet been shown to meet the WIPP acceptance criteria, or  
7 WIPP WAC. It was far from certified for shipment and  
8 could not be accepted by WIPP without additional  
9 characterization and review. While lessons learned from  
10 the WIPP event are informing waste processing and  
11 packaging at the generator sites, the processes and  
12 controls developed to protect WIPP did not apply  
13 directly to the activities or issues involved in the ARP  
14 event.

15 The ARP event serves as a significant  
16 opportunity to apply lessons learned, particularly when  
17 dealing with legacy waste, and/or waste with uncertain  
18 characteristics. To that end, the Department values the  
19 sharing of lessons learned that will significantly  
20 minimize the risk of recurrence and maximize worker  
21 protection, not only at WIPP, but at other generator  
22 sites across the enterprise.

23 Following the completion of the extensive root  
24 cause analysis of the ARP event, a safety alert was  
25 generated and issued under my signature to all the EM

22

1 waste processing sites. It is important to note that we  
2 included all waste processors and not just TRU waste  
3 processors. The safety alert provides lessons learned  
4 to processing sites and requires responses to  
5 headquarters on actions taken and potential inventories  
6 of legacy waste to be processed.

7 The safety alert also considers potential  
8 deflagration hazards associated with the storage of  
9 processed waste, which was not the case at the DOE Idaho  
10 ARP V event, which was drum overpressurization. It is  
11 important to reiterate that the event at ARP did not  
12 involve a deflagration but rather an energetic  
13 pressurization that overwhelmed each installed event.

14 This safety alert was also informationally  
15 provided to other DOE program offices to alert them to  
16 the event. And as a followup, EM is working closely  
17 with the Associate Under Secretary for Environment,  
18 Health, Safety and Security to issue a formal operating  
19 experience report, or OE, incorporating the objectives  
20 of the safety alert to all DOE program offices that  
21 process waste. That OE is currently in the concurrence  
22 process for issue.

23 With respect to oversight, DOE maintains full  
24 control of its TRU Waste Program and the safety bases  
25 infrastructure that governs it. We also rely where

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1 necessary on independent experts, such as the National  
2 Labs, to support our efforts. The implementation of the  
3 WIPP WAC has been successful in preventing unacceptable  
4 waste points from being sent to WIPP for processing of  
5 waste at local sites. The needs are often specific to  
6 the waste form and the required experts are engaged to  
7 ensure appropriate control sets. The lessons learned  
8 from the ARP event will be incorporated into our future  
9 operations.

10 I would also like to address the Board's  
11 previously documented concerns with DOE Standard  
12 5506-2007, Preparation of Safety Bases Documents for  
13 Transuranic Waste Facilities. We did make significant  
14 changes to the hazards analysis at WIPP because of the  
15 2014 incident. The hazards analysis was modified and  
16 Chapter 18 was added to the WIPP Documented Safety  
17 Analysis, or DSA, with the realization that accidents  
18 resulting from chemical incompatibility could exist at  
19 WIPP as a result of activities undertaken at a generator  
20 site.

21 Increased emphasis was placed on assurance that  
22 the WIPP WAC was met prior to receipt of waste at WIPP  
23 for the protection of public health and safety.  
24 Elements of this increased emphasis include: Enhanced  
25 chemical compatibility evaluations, added emphasis on

24

1 the basis of knowledge background of legacy waste, and  
2 enhanced reviews and oversight of the certification of  
3 waste prior to shipment to WIPP.

4 It is fair to say that these activities were not  
5 intended to protect waste generator sites for waste yet  
6 to be certified for shipment to WIPP. Where it protects  
7 such waste handling and processing activities at the  
8 generator sites are appropriate evaluation of activities  
9 and appropriate hazards evaluation, and establishment of  
10 controls to protect those activities.

11 DOE Standard 5506 is directed at analysis of  
12 postulated accidents from an appropriately thorough  
13 hazard assessment. DOE is currently in the process of  
14 revising Standard 5506 to incorporate lessons learned  
15 and feedback from the Board and the rest of the DOE  
16 complex.

17 In conclusion, the Board provides valuable  
18 insight and advice that the Department both appreciates  
19 and takes into consideration. Our work is critical to  
20 lowering environmental risks posed by the legacy of the  
21 Cold War. This requires us to take on hazardous waste  
22 streams and legacy waste streams that unavoidably lack  
23 complete information and documentation.

24 Especially for such waste with uncertain or  
25 unknown components, the potential for adverse chemical

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1 reactions cannot be eliminated with 100 percent  
2 confidence. There is no zero risk. We must recognize  
3 that there is risk in doing nothing. Our expectation is  
4 this potential is minimized greatly by establishing  
5 rigorous and appropriate control sets to protect the  
6 workers, the public and environment.

7 Thank you again for inviting us here today.

8 CHAIRMAN HAMILTON: Thank you, Mr. Griffin, and  
9 that's a lot there. I think we may replot some of that  
10 as we go through our questions, so keep that statement  
11 handy, you may want to refer to it a little bit more.  
12 And you may also want to go back and look at the  
13 reaction that I got from the Chairman of the House Armed  
14 Services Committee Strategic Forces Committee when I  
15 said that there is no such thing as zero risk. It  
16 wasn't a good day.

17 Okay. Ms. Roberson?

18 BOARD MEMBER ROBERSON: Thank you, Mr. Chairman.  
19 And good morning and thank you to each of you, and thank  
20 you, Mr. Griffin. You actually started to answer a  
21 question, my first question is actually to you. And I  
22 would say to you, the Board fully understands that there  
23 is no such thing as zero risk. What we're focused on is  
24 that there's I believe awareness of those known risks as  
25 action is taken, and that there is a careful approach,

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1 just like that EM applies to how it approaches D&D.

2 So with that said, I mean, we're going to talk a  
3 lot about safety, but I want to offer you the  
4 opportunity, since you didn't do it in your opening  
5 statement, to characterize, as we have noted, some of  
6 the considerable accomplishments EM has made in its  
7 Solid Waste Management Program.

8 MR. GRIFFIN: I'd be happy to do so. So I think  
9 Mr. Roscetti pretty well described the progress that's  
10 been made in many areas. If I go back to 2014 and look  
11 at the accomplishments, that's obviously a very  
12 impactful event, and I think and what I'm sure we will  
13 discuss this more through today's session, but I think  
14 there was a tremendous number of lessons learned and a  
15 tremendous impact across the entire program in terms  
16 of -- and I listed some in my opening remarks, but we  
17 obviously have great improvements in the -- in processes  
18 for certifying the waste for WIPP. We've made  
19 structural program changes in terms of how we provide an  
20 interface between headquarters and the sites, as well as  
21 between the Carlsbad Field Office, the National TRU  
22 Program and the generator sites.

23 The result has been over 500 shipments since we  
24 have reopened at WIPP. We've even averaged, in the  
25 month of May, 10 a week. So we really dramatically

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1 increased, and this is from multiple sites, not just  
2 Idaho. Of course, Idaho does tend to dominate and we  
3 have new sites ready to come online.

4 So I think we've taken those lessons to heart.  
5 We've made -- it's been, as I think in opening, the  
6 Chairman's opening statement, made a comment about the  
7 recent years, but in just the couple of years we've made  
8 tremendous progress in getting things back on the road.

9 This is a critical program for the nation,  
10 right? I mean, this waste cannot be left unattended.  
11 We have to deal with it, and we are very serious about  
12 take -- taking very seriously our responsibility to deal  
13 with it appropriately.

14 BOARD MEMBER ROBERSON: Thank you. So actually,  
15 my next question is to tag on, as the manager kind of  
16 responsible for overseeing the EM world, the generator  
17 sites, what are the things that you're concerned about  
18 in this particular mission area as the mission is  
19 executed?

20 You talked in your opening statement about  
21 sometimes not knowing what's in the waste. We  
22 understand that. In some cases, I mean, we're looking  
23 at specific activities at specific sites, in some cases  
24 the sites dealing with waste above ground still has  
25 waste below ground. In some cases, you may generate

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1 kind of unique waste as a result of treating other  
2 waste. What are the things that are on EM's leadership  
3 team's screen as it relates to this mission?

4 MR. GRIFFIN: Yes, thank you. My concerns, our  
5 focus as an EM leadership team in that area are to make  
6 sure that the sites have -- each site has to deal with  
7 their own particular set of issues. You know, Idaho  
8 with the buried waste, in some other cases some newly  
9 generated waste, legacy waste with different histories,  
10 it's important that we help those sites have all the  
11 resources they need to deal with their waste, to  
12 understand -- you know, to have the knowledge, the  
13 background and the information that's necessary to  
14 assess what needs to be done, what characterization is  
15 needed, what treatment may be needed, and we try very  
16 hard to help support those sites on their individual  
17 situations like that.

18 So that's why we have the National TRU Program  
19 to help cut across the entire complex and deal with the  
20 individual challenges at each site in order to help  
21 create this flow of waste that goes to WIPP and meets  
22 the requirements at WIPP.

23 BOARD MEMBER ROBERSON: And I assume that  
24 applies even like at some sites, it only becomes TRU  
25 once it's characterized. So I assume that applies even



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1 before something is deemed TRU Waste? Is that right?

2 MR. GRIFFIN: So yeah, it's true of -- I'm  
3 sorry, it applies to almost anything we deal with,  
4 right? I mean, you have to deal with what you -- you  
5 have to recognize where you have knowledge, what you  
6 don't understand, and then you have to use information  
7 you have available, the expertise that we have in the  
8 complex, that we have through the National Labs, that we  
9 have across headquarters and across the sites, to  
10 understand what you have. Whether we're talking about  
11 TRU waste or something else entirely. So yes.

12 BOARD MEMBER ROBERSON: Thank you.

13 CHAIRMAN HAMILTON: Thank you, Ms. Roberson.  
14 Board Member Connery?

15 BOARD MEMBER CONNERY: So I appreciate your  
16 opening comments, and we're trying to get some  
17 information out so the public has context. So I'm going  
18 to ask Mr. Roscetti in the interest of time to provide a  
19 brief overview of the Department's processes for  
20 managing safety during waste storage and processing.

21 MR. ROSCETTI: The individual facilities at  
22 generator sites and WIPP each have their own safety  
23 bases. The safety bases is the tool that the Department  
24 uses to systemically identify hazards related to a  
25 facility, estimate the consequences of potential

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1 accidents, and identify controls to prevent or mitigate  
2 the consequences to protect the public.

3 The Department's contractors typically use DOE  
4 Standard 5506-2007, Preparation of Safety Bases  
5 Documents for Transuranic Waste Facilities, to help  
6 determine which accident scenarios to analyze and how to  
7 analyze them. For events with potentially higher  
8 consequences, the Department implements controls that  
9 are more reliable. These are called safety controls.  
10 Different facilities may identify different control  
11 strategies based on their own analyses and  
12 circumstances.

13 The objectives of today's hearing focus on  
14 postulated accidents that may be initiated by undesired  
15 chemical reactions that occur in the waste.

16 Session 2 of today's hearing should cover  
17 specific controls for these scenarios.

18 BOARD MEMBER CONNERY: So Mr. Griffin described  
19 for us the fact that each site may have unique needs  
20 that the headquarters helps support, but that -- but as  
21 Chris just noted, and it was noted in both my opening  
22 and Mr. Griffin's opening, there is kind of an  
23 overarching standard, 5506, that kind of guides this.

24 Since 2015, the Department has been in the  
25 process of revising this standard, and in early 2018,

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1 the Board transmitted Tech Report 43 noting deficiencies  
2 in the standard, and as you noted, you're undergoing  
3 review. And I was thrilled to hear that last week  
4 coincidentally there was a workshop to discuss some of  
5 these issues to maybe move this forward a little bit  
6 faster than it's been going.

7 So my question is to Mr. Chung. Can you just  
8 describe the status and schedule for updating Standard  
9 5506, and the plan for incorporating lessons learned  
10 from both WIPP and Idaho?

11 MR. CHUNG: Sure, thank you. Before I answer  
12 that question, since I was the lead for the original  
13 effort that published 5506 standard 12 years ago,  
14 roughly, I feel that as the former technical lead for  
15 that standard, that that standard has provided its  
16 intended purpose and objectives in terms of standardized  
17 the way we would analyze the hazards that are typically  
18 associated with TRU waste operations, which includes  
19 both processing, treatment, as well as storage.

20 In the context that it makes sense we're  
21 providing a control set, which goes beyond just the  
22 safety related controls that would provide reasonable  
23 assurance for adequate protection for both public as  
24 well as workers. That went through a great deal of  
25 consensus building, including the Board at the time. As

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1 I recall, that standard was supported by the Board, as  
2 well as the rest of the Department.

3 The other thing I'd like to mention is that 5506  
4 standard does not stand alone as the set of controls or  
5 programs that provides adequate protection. 5506 is a  
6 supplemental guidance to the -- one of the safe harbors  
7 that are called out for in the section subpart B of 830,  
8 10 C.F.R. 830.

9 The other thing that's important to all of us, I  
10 believe, is that we have many relevant safety management  
11 programs. Things like Radiation Protection Program,  
12 Hazardous Material Protection Program, Industrial  
13 Hygiene Program, maintenance, conduct of operations,  
14 Q/A. So there's all sorts of relevant programmatic  
15 elements that provide another strong basis for a safe  
16 operation.

17 So I'd like to point out that while 5506  
18 standard provides important role in terms of providing  
19 upper tier set of controls from a nuclear safety  
20 standpoint, we do have a suite of directives and  
21 resulting controls that we apply during our day-to-day  
22 operations. Not so unique to waste processing  
23 operations, but throughout our nuclear operations in the  
24 complex.

25 With respect to your pointed question in terms

1 of status of the Standard 5506, one of the reasons that  
 2 we have waited until very recently to resume that effort  
 3 is twofold. Is one, we wanted to make sure that we have  
 4 a thorough understanding of the ARP V event in terms of  
 5 the technical root causes, in terms of any other  
 6 management or other types of root causes, or causal  
 7 factors that may have contributed to that event. It  
 8 took a while for our contractor folks and their  
 9 corporate folks to be able to develop very definitive  
 10 and root cause analysis and associated corrective  
 11 action. So that was finalized back in February of this  
 12 year.

13 The other thing that we were waiting for was  
 14 some of the results that we were getting from the Sandia  
 15 fire related test results, as well as any additional  
 16 test -- needs that we may want to pursue. So we felt  
 17 that this is the right time to resume in terms of having  
 18 the right type of people, I think we assembled a pretty  
 19 good group of experts last week to basically resume that  
 20 effort, and my direction to them was to -- let's go  
 21 through the entire 200-plus pages of the standard very  
 22 carefully. Let's look at all of the feedback and  
 23 comments that we have received from the complex, from  
 24 our Federal colleagues, as well as from the contractors,  
 25 plus the issues and concerns that were raised in the

1 Defense Board's Tech Report 43.  
 2 So we believe we have a pretty thorough  
 3 understanding of the overall needs going into this  
 4 resumed effort to revise the standard. And as of this  
 5 morning, we have issued a justification -- project  
 6 justification statement to our corporate E, S and H,  
 7 which means that there's a 15-day review process for  
 8 that justification for revising that standard. And then  
 9 we already have received some preliminary feedback from  
 10 places like Hanford, in terms of their overall  
 11 consolidated comments on the standard.  
 12 So our plan is to go through what was laid out  
 13 in the justification statement for revising the  
 14 standard, and roughly we think that by next year this  
 15 time, that we would have that hopefully published.  
 16 So if you back off, in terms of drafting the  
 17 revision to the standard in various sections, we're  
 18 probably talking about six to eight months from now to  
 19 have a final draft, and then that will allow adequate  
 20 time for what is known as a RevCom process for  
 21 complex-wide review and approval.  
 22 BOARD MEMBER CONNERY: Thanks, I appreciate  
 23 that. Just a quick technical question. So the project  
 24 justification document that was issued this morning,  
 25 which we haven't seen yet, does that supercede the one

1 that you put forward in 2015? Because it was already a  
 2 justification.

3 MR. CHUNG: It supersedes and supplements  
 4 that --

5 BOARD MEMBER CONNERY: Okay.

6 MR. CHUNG: -- that document with a lot more  
 7 detailed information that captures what we know today  
 8 versus what we had known in 2015.

9 BOARD MEMBER CONNERY: Okay. I appreciate that.  
 10 We look forward to seeing that. And I also appreciate  
 11 the description of the fact that 5506 is nested into a  
 12 number of other standards and directives. Obviously we  
 13 follow those very closely, but I wish we had time to  
 14 talk about revisions to 830, but we'll save that for  
 15 another conversation.

16 But I'd like to turn, since we have been talking  
 17 about Tech Report 43, to Mr. Roscetti to just describe  
 18 the staff's assessment of the standard based on some of  
 19 the information that we provided in Tech Report 43.

20 MR. ROSCETTI: As I said in my other testimony,  
 21 the Department's contractors typically use DOE Standard  
 22 5506-2007 to guide the development of safety bases for  
 23 facilities that process and store TRU waste, in addition  
 24 to the other Department standards and safe harbors. In  
 25 2018, the Board issued Tech Report 2007, Preparation of

1 Safety Bases Documents for Transuranic (TRU) Waste  
 2 Facilities. This technical report provided the Board's  
 3 staff's assessment of weaknesses in the standard known  
 4 in 2018.

5 (Exhibit Number 3 was entered into the record.)

6 MR. ROSCETTI: I would like to enter Exhibit 3  
 7 into the record. Exhibit 3 quotes one of the  
 8 deficiencies discussed in the technical report. The  
 9 2014 WIPP event highlighted the fact that undesired  
 10 chemical reactions can lead to releases of radiological  
 11 material. While Standard 5506 recognizes this fact, the  
 12 standard provides relatively little guidance on how to  
 13 analyze and how to control such hazards.

14 To the extent the standard does have guidance on  
 15 chemical reaction hazards, the Board's staff is  
 16 concerned that the standard underestimates the potential  
 17 consequences of such events.

18 After the WIPP event, the Department determined  
 19 that the amount of radioactive material released was  
 20 significantly greater than currently considered by DOE  
 21 Standard 5506. This is important for the entire complex  
 22 because the amount of radioactive material estimated to  
 23 be released during potential accidents is used to  
 24 identify safety controls to prevent or mitigate such  
 25 accidents.

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1 The Board's staff has performed a cursory review  
 2 of the safety bases for TRU waste facilities and found  
 3 that several facilities have not incorporated, updated  
 4 release parameters for an energetic chemical reaction  
 5 into their safety analyses. Including this information  
 6 in the safety bases could drive the Department and those  
 7 specific facilities to identify additional safety  
 8 controls that could help prevent or mitigate an  
 9 energetic release event.

10 Since the Board issued the technical report, the  
 11 April 2018 Idaho event occurred, which the Board staff  
 12 believes provides additional information related to  
 13 release parameters. As with the WIPP event, the Board  
 14 staff believes this information should be incorporated  
 15 into Standard 5506 and the facility safety bases.

16 CHAIRMAN HAMILTON: Thank you, Board Member  
 17 Connery.

18 Ms. Roberson?

19 BOARD MEMBER ROBERSON: Thank you, Mr. Chairman.  
 20 So we're talking about 5506, and I wanted to say my  
 21 question is actually -- I have several questions for  
 22 you, Mr. Chung, but I appreciate your comment, and as  
 23 Ms. Connery said, we spent a lot of our time evaluating  
 24 the execution of the safety management programs, as do  
 25 you and your staff, and we know the execution isn't

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1 always consistent and predictable across the sites and  
 2 across the programs, which is the reason why it's so  
 3 important to take a step like EM did in issuing the  
 4 safety alert.

5 (Exhibit Number 13 was entered into the record.)

6 BOARD MEMBER ROBERSON: And so I want to enter  
 7 that safety alert on the record of the hearing as  
 8 Exhibit 13, and a copy of it is on the resource table in  
 9 the back, and it's also on our website. And I wanted to  
 10 ask you, Mr. Chung, to summarize the environmental  
 11 management safety alert.

12 MR. CHUNG: Thank you. I'm just going to  
 13 summarize what we have communicated in that written  
 14 safety alert that Jeff mentioned. Not only that we have  
 15 considered the two main causes that were identified by  
 16 the contractor-led investigation, as well as their  
 17 corrective action, we also looked at the eight  
 18 contributing causes, which include some aspects of  
 19 safety culture.

20 Things like how to manage changes. How to  
 21 detect and also act properly when you see potential  
 22 change in conditions of the waste. So it was just more  
 23 than dealing with a pure technical aspect.

24 And we've actually had some discussions with the  
 25 field, those that have generated waste and still are, to

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1 look for their immediate input in terms of their  
 2 reaction to what they have read or heard. So which  
 3 culminated in issuance of safety alert. So the safety  
 4 alert applies to all of the site waste generating  
 5 activities, waste previously generated on site and now  
 6 stored or being repackaged; retrieval and repackaging of  
 7 legacy waste retrieved from other sites as well.

8 If you look at the safety alert, we required  
 9 certain actions, then we also have some recommended  
 10 actions. Let me just give you an example of required  
 11 actions. So it is required for each site to complete a  
 12 site-specific extent of condition review for  
 13 radioactivity in mixed waste drums in storage that have  
 14 not been certified.

15 And there are seven criteria or questions that  
 16 they must encompass in terms of performing their  
 17 site-wide or site-specific standard condition review:  
 18 Identification of flammable gas; testing protocols and  
 19 frequency of testing; identify the circumstances in  
 20 which flammable gas testing is not performed and the  
 21 rationale for this approach; identify the number of  
 22 waste drums containing flammable or near flammable gas  
 23 concentrations; and the controls in place to mitigate  
 24 their hazard; identifying the inventory waste drums that  
 25 contain or could contain metal carbides, including waste

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1 streams yet to be discovered or recovered or excavated;  
 2 identifying the inventory of waste drums which with  
 3 uncertain process documentation to determine pyrophoric  
 4 and flammable gas generating potential; describe the  
 5 processes in place for monitoring and managing these  
 6 uncertainties in the waste management activities.

7 And also, we asked them again to evaluate any  
 8 waste condition of concern that are identified in  
 9 accordance with DOE Standard 5506, including all of the  
 10 lessons that were either already applied or should be  
 11 applied from the WIPP event as well.

12 Chris mentioned about the importance of  
 13 predominantly the release fraction that resulted from  
 14 the more energetic chemical event at WIPP, which was  
 15 applied not only to the WIPP facility, but also for the  
 16 remediated nitrate salt resumption operation at Los  
 17 Alamos. There was, I believe, an operating experience  
 18 report that was issued back in 2015 to highlight that  
 19 concern to the complex, and those two sites were the  
 20 sites that responded in terms of the need to apply the  
 21 higher release fraction, which would obviously give a  
 22 higher consequence estimate.

23 So the site-specific extent of condition reviews  
 24 would be collected and compiled. We asked the sites to  
 25 submit their input by end of September, and then we will

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1 put together a small, a very strong team at  
 2 headquarters, which may include some other outside  
 3 experts to look at all of the site-specific extend of  
 4 condition reviews to come up with a complex-wide extent  
 5 of condition review and lessons learned. That is the  
 6 plan for addressing the required action.  
 7 There are also quite a few recommended actions,  
 8 which include some of the nontechnical aspects, like --  
 9 let me just point out a couple of things. Promote  
 10 continuance improvement in site safety culture, where  
 11 workers can express an inquisitive attitude toward  
 12 challenging assumptions, regardless of potential impact  
 13 of cost and schedule.  
 14 A similar aspect of this was already identified  
 15 by the Idaho Fluor contractor as part of their causal  
 16 factors or contributing causes. So we think that that  
 17 is an important factor into dealing with the  
 18 uncertainties, recognizing that no matter how good your  
 19 hazard identification or hazard analysis or reaction  
 20 analysis are, you're going to have that element of  
 21 uncertainties. And we believe that it's very important  
 22 to have not only well trained and qualified operators,  
 23 but we have to create -- we have to continue to provide  
 24 positive safety culture so that they are able to pause  
 25 or ask the right questions in terms of managing the

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1 changes that I mentioned earlier.  
 2 BOARD MEMBER ROBERSON: Okay. Thank you.  
 3 MR. CHUNG: And that's what the safety alert  
 4 contains.  
 5 BOARD MEMBER ROBERSON: Thank you so much. One  
 6 short question. You didn't require this, but you didn't  
 7 preclude it either. If in doing that data gathering and  
 8 analysis, is there an intent that the site make changes,  
 9 for instance, to its facility safety bases if it  
 10 identifies information?  
 11 MR. CHUNG: Yes.  
 12 BOARD MEMBER ROBERSON: You didn't require it,  
 13 but that is your intent?  
 14 MR. CHUNG: Yes. You know, just if I may add,  
 15 we do have a pretty good engagement in terms of what's  
 16 going on in the field. Many of our headquarters staff  
 17 are deeply engaged in either supporting or providing  
 18 oversight/insight in terms of development or changes to  
 19 the safety base documents.  
 20 In terms of revising fire hazard analysis, which  
 21 is also a very important element of developing adequate  
 22 safety bases, which should be provided to the hazard  
 23 analyst in terms of identifying, hey, do we have a  
 24 pyrophoric potential, do we have combustible materials,  
 25 do we have any known prohibited items. So we're also

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1 engaging up with the field folks in terms of what may be  
 2 happening so that they don't have to wait until the  
 3 so-called complex-wide extent of condition review is  
 4 completed prior to making any necessary changes into or  
 5 onto their safety base document.  
 6 BOARD MEMBER ROBERSON: Okay. Thank you, sir.  
 7 So, Mr. Wyka, what actions or directions has  
 8 NNSA provided to account for the known deficiency in the  
 9 standards, since you guys generate waste, too?  
 10 MR. WYKA: Thank you, ma'am, for that question.  
 11 And first of all, the safety management of waste and  
 12 storage and processing is paramount to NNSA, you know,  
 13 for our mission activities. You know, the timing of the  
 14 inventory of the stored new gen waste from TA-55,  
 15 transuranic waste facility, as well as Livermore, is  
 16 critical to not only our current missions, but our  
 17 future missions, which is the NNSA pit production  
 18 initiative.  
 19 So it's critical that we get this done, and it's  
 20 critical that we work as one team to get it done,  
 21 because we can't do it all by ourselves.  
 22 It requires the Carlsbad Field Office, their  
 23 contractor, the labs. We're required to assure  
 24 continuous and efficient characterization and  
 25 certification of the TRU waste before shipping it to

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1 WIPP.  
 2 So with that in mind, you know, NNSA learned  
 3 from both events, both from the WIPP event, as well as  
 4 from this ongoing event, and it's critical that we take  
 5 those lessons learned, and again, work as one team,  
 6 recognizing that the events are distinctly different,  
 7 but NNSA and I specifically reviewed the EM safety alert  
 8 regarding the April 2018 event.  
 9 On May 31st, I issued a direction to the field  
 10 office managers to review the safety alert. This was  
 11 done via an email. The intent of this direction was to,  
 12 you know, alert the NNSA sites to this issue, first of  
 13 all, to gauge the potential for recurrence of this type  
 14 of event, and to consider steps to prevent such  
 15 occurrence.  
 16 Now, while the alert is sort of at EM sites, I  
 17 think this allows the NNSA sites to pause and to think  
 18 about it in terms of our respective operations. NNSA  
 19 sites are not yet required to provide a written response  
 20 on the specific actions such as required by EM, but they  
 21 have been directed, requested, to complete these actions  
 22 as soon as practicable, and that the results would be  
 23 discussed with NNSA headquarters as part of our new gen  
 24 TRU Waste Program Review in October of this year. The  
 25 actions that I specified for them to take on was to

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1 first ensure and review the ARP causal analysis report,  
 2 and incorporate lessons learned into appropriate site  
 3 procedures, as well as review any DOE Standard 5506  
 4 accident scenarios against the waste repackaging  
 5 activities, as well as assessing training personnel,  
 6 training of personnel responsible for approving waste  
 7 for processing and treatment to ensure that they are  
 8 sufficiently qualified for such treatment operations.  
 9 Also ask them to review and update as necessary waste  
 10 operator training materials to ensure modules address  
 11 the identification and change of waste conditions, i.e.  
 12 pyrophoric materials, oxidizing materials and other  
 13 challenging waste type forms. To evaluate existing  
 14 processes for treating wastes of uncertain pedigree. To  
 15 ensure effective controls are in place to safely handle,  
 16 package, treat and store waste pending that transport  
 17 and disposal.

18 I also asked them to review procedures for  
 19 current and future drums with packaged waste to ensure  
 20 effective controls are in place to prevent or mitigate  
 21 unexpected reactions, to review radiological procedures  
 22 for appropriate entry requirements for areas with  
 23 potential airborne transuranic hazards, and to continue  
 24 promoting improvement of the safety culture to  
 25 contributing causes specified in the alert.

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1 Recognizing that the Department will be  
 2 operating -- will be issuing an operational alert, which  
 3 will go Department-wide, but NNSA recognizing the  
 4 importance, you know, of waste management to our  
 5 mission, you know, taking a -- the actions as I  
 6 specified.

7 BOARD MEMBER ROBERSON: Thank you. So that's  
 8 formal guidance you provided to the generator sites?

9 MR. WYKA: Yes, ma'am. It was direction to the  
 10 field office managers, outlined providing the alert, and  
 11 providing the context and an application to us as well  
 12 as some specific actions for them to take, and that we  
 13 would be looking to discuss this as a team at the  
 14 program review in August of this year.

15 BOARD MEMBER ROBERSON: So that guidance, is  
 16 that something you could evaluate and provide into the  
 17 record of this hearing?

18 MR. WYKA: Yes, ma'am.

19 BOARD MEMBER ROBERSON: Okay. Thank you.

20 CHAIRMAN HAMILTON: Thank you, Ms. Roberson.  
 21 Mr. Griffin, I would like to shift gears a little bit  
 22 and talk about how scheduled pressure may erode safety.  
 23 You and I are in violent agreement that there's no such  
 24 thing as perfection in safety, that our goal is to  
 25 achieve adequate protection. In fact, that's what our

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1 statute calls for in the Atomic Energy Act is adequate  
 2 protection. So I get that.

3 I also understand that any time any human  
 4 endeavor involves some element of risk, there's also  
 5 risk for not doing something. And so you have to have a  
 6 schedule, and the question is how do you balance that.  
 7 (Exhibit Number 4 was entered into the record.)

8 CHAIRMAN HAMILTON: Could you put up Exhibit 4  
 9 and enter it in the record, please. And I'm just going  
 10 to pause and let you read this for a minute.

11 My question to you is kind of general in nature,  
 12 but I'd just like to understand how you and the  
 13 Department balance production priorities and prevent  
 14 greater pressure from schedules from eroding safety.  
 15 How do you balance production priorities with your  
 16 responsibilities as regulator of safety?

17 MR. GRIFFIN: Thank you, that is actually an  
 18 excellent question. And actually I think one that the  
 19 philosophy of that area is one that we actually have  
 20 spent quite a bit of time talking about. And I guess I  
 21 would start by saying, I don't think we see it as a  
 22 balancing act, but more as a responsibility that we have  
 23 the responsibility to execute work in the field, and we  
 24 understand that that's our mission.

25 And so what we have to do is create the

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1 processes and procedures that allow us to execute that  
 2 work safely. I mean, it's a given that we have to go do  
 3 this work, so how do we go about doing that? How do we  
 4 create the processes and procedures and how do we bring  
 5 in the lessons learned? Because things happen  
 6 sometimes. How do you build that in and continually  
 7 improve this?

8 So I guess I'm trying to -- I'm trying to say  
 9 that I'm not sure we would see that as necessarily  
 10 having to choose one or the other, but recognizing that  
 11 we have to go down this path of executing this mission,  
 12 how do we build in the appropriate safeguards, processes  
 13 and procedures that allow us to do that safely, or then  
 14 constantly improve that.

15 So that's something that we're continually  
 16 working at, and, you know, both at headquarters, with  
 17 the sites, and I think it goes back to what Dae was  
 18 talking about earlier, that, you know, the safety alert  
 19 and trying to talk to the sites and get their feedback  
 20 on this.

21 I'm not sure that completely answers the  
 22 question, but I guess I wanted to try to get away of  
 23 this view as the balance there.

24 CHAIRMAN HAMILTON: Well, Mr. Chung wants to  
 25 provide some additional information. Go ahead.

1 MR. CHUNG: One of the I think significant  
 2 lessons we have learned and we're continuing to learn  
 3 from the whole ISMS, Integrated Safety Management  
 4 System, related efforts over the last two decades, since  
 5 the K-Reactor restart days, is that we need to factor in  
 6 safety as part of our business model up front. Whether  
 7 you're pursuing a major capital project, where safety  
 8 becomes very important from a design perspective,  
 9 whether safety plays into an important role from a  
 10 day-to-day work planning and process activities.  
 11 So I think we fully recognize, by now, the  
 12 importance of safety and even quality that those  
 13 elements must be integrated into the work, while  
 14 appreciating the fact that we do have cost and schedule.  
 15 Without cost and schedule objectives, you know, why have  
 16 contracts, right? So our work is being performed by  
 17 very experienced contractor communities, and we have to  
 18 establish contractor scope.  
 19 Within the contractor scope we have certain  
 20 milestones. We have cost baseline, we have schedule  
 21 baselines, and we are continuing to make sure that our  
 22 workforce understands, not in terms of balancing, but  
 23 they have to understand and appreciate the objectives of  
 24 our mission and work scope at hand. At the same time  
 25 realizing that the safety and the quality, security

1 even, must be integrated into their work so that -- so  
 2 that they make the right decisions.  
 3 Therefore, we actually enable getting our  
 4 mission done more efficiently and effectively. I think  
 5 that's our goal. And I think that's the goal of the  
 6 Department for the past couple of decades, and I think  
 7 EM is continuing to strive for that approach.  
 8 And also making sure that this business about  
 9 safety bases isn't -- some folks think that if you have  
 10 a very conservative, rock-solid safety bases, that  
 11 you're good to go, but that is just a part of it. So we  
 12 need to make sure that our workforce understands not  
 13 only those upper tier set of nuclear safety related  
 14 controls, but the importance of integrating hazard or  
 15 safety into the work.  
 16 Everyone uses some sort of procedure to execute  
 17 the work, right? So -- and there is a planning process.  
 18 There is an execution phase. So that's where I think we  
 19 need to continue to improve in terms of instilling that  
 20 mindset as well as the activity level and process level  
 21 controls so that the workers who are on the deck plate  
 22 executing this important work carry those mission, work,  
 23 safely.  
 24 CHAIRMAN HAMILTON: I appreciate that. Let me  
 25 just in the interest of keeping us rolling here on time,

1 look at that second bullet again. It talks about  
 2 schedule pressure was felt by contractor personnel over  
 3 the entire period evaluated. And that was a year and a  
 4 couple of months ago. Just a short answer, what's one  
 5 or two things that have been done in the last 14 months  
 6 to address that?  
 7 MR. CHUNG: Me?  
 8 CHAIRMAN HAMILTON: Just very briefly.  
 9 MR. CHUNG: If I may, Idaho Fluor actually asked  
 10 EM headquarters to help them review their safety  
 11 culture. So we have provided our own expert from  
 12 headquarters as well as some of the well-known industry  
 13 experts in safety culture area to go up to Idaho and  
 14 looked at various facets of the safety culture, not at  
 15 just the program, but through a suite of interviews, all  
 16 the way down to the operating deck. They either  
 17 reinforced some of the weaknesses, they also found some  
 18 strengths. So that's one of the actions that both our  
 19 contractor and DOE have taken to strengthen that aspect.  
 20 CHAIRMAN HAMILTON: Thank you.  
 21 MR. CHUNG: And Jack may be able to provide a  
 22 more detailed response.  
 23 CHAIRMAN HAMILTON: I think that's sufficient.  
 24 Thank you.  
 25 Ms. Connery?

1 BOARD MEMBER CONNERY: So I appreciate that, and  
 2 we would love to get a copy of the Safety Culture Report  
 3 and the methodology by which it was provided, because I  
 4 don't believe we have a copy of that yet.  
 5 But my question is for Mr. White, because he  
 6 looks lonely and he looks like he is wanting to speak.  
 7 As the lead for the Department's formal accident  
 8 investigation for the WIPP radiological release and the  
 9 previous deputy manager at the NNSA Los Alamos Field  
 10 Office, you're uniquely qualified to understand the  
 11 multiple factors that contributed to the release. And  
 12 one of these factors, as we noted, was schedule  
 13 pressure.  
 14 In your current role with the National Nuclear  
 15 Security Administration, which is under schedule  
 16 pressure to accomplish many of its national security  
 17 missions, can you discuss NNSA's approach to avoiding  
 18 the negative effects of the challenging schedule,  
 19 particularly with respect to waste, which can receive a  
 20 lot less attention compared to weapons components?  
 21 MR. WYKA: Thank you, ma'am, for that question,  
 22 and as I previously mentioned, you know, the management  
 23 of waste, from our perspective, is just as important,  
 24 you know, as the mission, because we -- you know, for us  
 25 to do our mission, we need to be able to remove waste,

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1 you know, from our generator sites to make room in terms  
 2 of tomorrow's world in terms of storage, but, you know,  
 3 balancing the mission schedule and safety at generator  
 4 sites is critical. And, you know, in response to the  
 5 previous question of what new activities can we do, it's  
 6 probably doing the old activities and implementing those  
 7 effectively. And that's dating back from the Board's  
 8 recommendation 95-2, Integrated Safety Management. And  
 9 it's that balancing the schedule and the safety and  
 10 making the safety as a critical part of the mission.

11 So the NNSA, NNSA generator sites constantly  
 12 strive to balance that mission with safety through  
 13 establishment of challenging and yet achievable goals in  
 14 the TRU waste contracts, and that's our vehicle that we  
 15 use. You know, there's a strong partnership to ensure  
 16 that the mission goals and safety are intertwined, you  
 17 know, as outlined in the Department's expectations for  
 18 integrated safety management and for a strong safety  
 19 culture.

20 And it's something that you have to continuously  
 21 look at, because when you think you have a strong  
 22 integrated safety management or safety culture in place,  
 23 you know, you're looking for those weak signals, weak  
 24 signals where it's degrading and where you're back  
 25 sliding a little bit.

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1 But these expectations are clearly defined in  
 2 our prime contracts, and the workers at the generator  
 3 sites are well versed on the hazards associated with the  
 4 work, and are involved in the development of controls,  
 5 but it's to maintain that pressure of continuing to  
 6 strive for improvement with integrated safety management  
 7 systems, safety culture, as a critical element of  
 8 getting the work done and completing the mission.

9 And they prevent or mitigate consequences from  
 10 the hazards and are comfortable with the controls  
 11 established -- these are the workers -- to protect the  
 12 workers, the public and the environment. So, you know,  
 13 it's the actual and effective implementation, integrated  
 14 safety management, continuing to build on that.

15 And we saw that in both the -- with this current  
 16 event, the WIPP event, and some of the contributing  
 17 causes were similar. The mechanisms may have been a  
 18 little different, as well as any -- you know, most of  
 19 the other, you know, events, if you dissect them and  
 20 look at the contributing causes past the root causes,  
 21 it's, again, effective implementation of, you know,  
 22 those systems that we have been trying to and continue  
 23 to put in place for the last, you know, 20 years.

24 BOARD MEMBER CONNERY: Thank you.  
 25 CHAIRMAN HAMILTON: Thank you, Ms. Connery.

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1 Ms. Roberson?  
 2 BOARD MEMBER ROBERSON: Thank you, Mr. Chairman.  
 3 So first of all, congratulations, Mr. Shrader,  
 4 on your more recent assignment. But in light of your  
 5 previous role as Carlsbad manager, and other roles in  
 6 the complex, can you describe the division of  
 7 responsibility in the Environmental Management Program  
 8 relating to ensuring safety of waste from generation to  
 9 final disposal?

10 MR. SHRADER: Sure. I think Mr. Griffin alluded  
 11 to this in his opening remarks. The programs and  
 12 processes we've put in place after the WIPP event were  
 13 specifically put in to protect WIPP, and these would be  
 14 enhanced certification processes such as enhanced  
 15 acceptable knowledge reviews, chemical compatibility  
 16 evaluation reviews, basic knowledge reviews where we  
 17 look at oxidizers, nitrates, et cetera.

18 All of that is intended to ensure the waste  
 19 prior to putting into shipping container or TRUPACT,  
 20 prior to the shipping at WIPP, is going to be safe  
 21 there. That's been enshrined within our DSA. In fact,  
 22 a new Chapter 18, and we were the first in the complex  
 23 to have that specific waste management chapter within  
 24 the DSA. That ensures that the work done at the sites  
 25 as the waste is prepared ensures that WIPP is safe.

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1 Moving up stream of that, the site itself is  
 2 responsible for safety at the site. For instance, they  
 3 have their own DSAs for, say, a TRU storage facility,  
 4 they have their own permits, for instance, for RCRA  
 5 compliance, that type thing. We define those through  
 6 memoranda of agreement between the site and the Carlsbad  
 7 Field Office, where we specifically call out what those  
 8 divisions of responsibilities are.

9 We also have the site certification process  
 10 where we send a team out to the site, look at the  
 11 certified program, and ensure that it's meeting the  
 12 requirements of our permit itself. When that team is  
 13 satisfied that the permit requirement is being met, the  
 14 Carlsbad Field Office manager certifies the site for  
 15 shipment.

16 And then we have a third piece that we think  
 17 helps in both sides of the equation, the Generator Site  
 18 Technical Review. This was a new process put in place  
 19 after the events where it's going to look at not the  
 20 certified program and permit compliance, but general  
 21 processes and work done at the site. It's built around  
 22 giving assurance to the manager of the Carlsbad Field  
 23 Office that the site has rigorous procedures and  
 24 processes in place to ensure safety of the waste coming  
 25 in, but at the same time, it also gives some lessons

1 learned and some issues that the site can use some  
 2 improvement to safety at the site itself, also.  
 3 BOARD MEMBER ROBERSON: So I think we are going  
 4 to have questions, we are going to talk about the  
 5 technical reviews later, but based on your experience,  
 6 can you describe some of the challenges that you have  
 7 seen in making sure that waste is acceptable for risk?  
 8 Is it really in the processes possible?  
 9 MR. SHRADER: Sure. You know, I think we've --  
 10 it's been alluded to a couple of times here. Legacy  
 11 waste, of course, is our most challenging waste, and  
 12 that's because the paperwork or the acceptable knowledge  
 13 and the history of that waste is often not as detailed  
 14 as it is today. And it's because some of the waste was  
 15 generated 30, 40 years ago.  
 16 So our challenge there is to go in and expand  
 17 how we look at the waste and look at the documentation.  
 18 You don't look at just -- for instance, when you're  
 19 looking at chemicals, potential chemicals of waste, you  
 20 don't look at just what the process was. What are the  
 21 chemicals used in the buildings, what were the other  
 22 processes used in, say, a glovebox at Rocky Flats, for  
 23 instance.  
 24 And so that's how we address those challenges.  
 25 By far the biggest is just do we really understand what

1 the waste is, and that's where we expand our reviews of  
 2 the documentation and the history of the waste. And it  
 3 gives us -- once we do that, we think we can build a  
 4 much better, more comprehensive what we call acceptable  
 5 knowledge package which is a combination of all the  
 6 documentation to describe what the waste is.  
 7 BOARD MEMBER ROBERSON: And are there other  
 8 potential actions that could be taken to ensure that the  
 9 process from beginning to end is safer or more  
 10 efficient? Or is that pretty much encompassed?  
 11 MR. SHRADER: No. If -- in certain cases, you  
 12 may get to the point where the acceptable knowledge of  
 13 paperwork simply is not sufficient, and you could go  
 14 into a sampling analysis regime, if you needed to, for  
 15 certain waste streams to build your higher level  
 16 knowledge, for both safety and, frankly, RCRA  
 17 compliance, also, compliance with our permit.  
 18 Further up stream of that, some of the things  
 19 that certainly help with legacy, is I think we talked  
 20 about the lessons learned process, both the formal  
 21 process, the safety alert that was alluded to earlier,  
 22 and even the informal processes the Carlsbad Field  
 23 Office have that we communicate with all the sites on a  
 24 biweekly basis, all the TRU generating sites of lessons  
 25 learned and things we've seen and maybe they can

1 incorporate into how they do operations, also.  
 2 BOARD MEMBER ROBERSON: Okay. Thank you.  
 3 CHAIRMAN HAMILTON: Thank you, Ms. Roberson.  
 4 Mr. Shrader, you're on a roll, so I'm going to  
 5 stay with you for another minute here. I'd like to talk  
 6 about how the learning at individual sites is translated  
 7 across the complex. We understand that one of the  
 8 Department's prominent corrective actions taken in  
 9 response to the WIPP event was to establish a Generator  
 10 Site Technical Review process to ensure the waste is  
 11 acceptable at WIPP. This process uses experts to review  
 12 whether processes and procedures are in place at  
 13 generator sites to ensure that the transuranic waste  
 14 meets the WIPP acceptance criteria.  
 15 (Exhibit Number 5 was entered into the record.)  
 16 CHAIRMAN HAMILTON: I'd like to enter Exhibit 5  
 17 into the record, please, and I'll just pause and let you  
 18 read that for a moment.  
 19 Our staff reviewed several of these reports, and  
 20 we found that some common issues were -- some of the  
 21 issues were common across multiple sites, and you can  
 22 see them up there. Can you tell us how you identify and  
 23 address deficiencies that are found at an individual  
 24 site that turn out to be common over multiple sites?  
 25 How do you translate that into policies and procedures

1 across the whole complex?  
 2 MR. SHRADER: Sure. So the -- I'll take the  
 3 second one first. This issue of worker knowledge.  
 4 Often times that may not translate into a -- necessarily  
 5 a safety risk. It may translate into an efficiency  
 6 risk. And by that I mean, there are a certain amount of  
 7 knowledge we look for as we certify transuranic waste.  
 8 What the process was, what the documentation, et cetera.  
 9 By ensuring workers have a knowledge of where  
 10 information is going to be used earlier, it can increase  
 11 efficiency down the line.  
 12 How that's translated to the site specifically  
 13 is, again, we have the -- our calls with the sites every  
 14 couple of weeks where we have specific lessons learned  
 15 we can apply. We also have -- about every nine months  
 16 we have a generator site meeting where all the sites  
 17 come together. The next one is in Chicago at the end of  
 18 July.  
 19 We have very specific sessions on that about  
 20 common areas -- common issues we've seen at GSTRs,  
 21 lessons learned, and so that's a good chance to bring  
 22 all the sites together and talk to them about here's  
 23 what we've seen in multiple sites around the complex,  
 24 and we can pass that knowledge on at that point.  
 25 The first one is similar. Some of that the



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1 absorbents -- or some of the chemicals information we  
 2 knew, that will sometimes translate into the certified  
 3 program where we will have very specific questions we  
 4 look for specific waste streams based on what we see  
 5 there, also. So that goes into the certified program  
 6 review of sites.  
 7 CHAIRMAN HAMILTON: I would hope certainly you  
 8 wouldn't wait until you have a conference in Chicago if  
 9 you found something that was relevant to all the sites.  
 10 MR. SHRADER: Certainly. And that's why I  
 11 mentioned, we have a call every two weeks with the waste  
 12 generator sites that's led by my assistant manager for  
 13 the National Transuranic Waste Program, all the sites on  
 14 it, and that's a common place that we can talk about  
 15 this. And if it were truly to rise to a high enough  
 16 level, we can always use the more formal mechanisms the  
 17 Department uses, such as the Safety Alert System or  
 18 operating experience, et cetera.  
 19 CHAIRMAN HAMILTON: Okay, thank you.  
 20 Mr. Griffin, would you like to add anything to  
 21 that? You don't have to, but I know this is in your  
 22 lane.  
 23 MR. GRIFFIN: No, I think I would have said  
 24 exactly what Todd said.  
 25 CHAIRMAN HAMILTON: Fine. I just wanted to give

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1 you the opportunity. Thank you.  
 2 Ms. Roberson? Oh, I'm sorry.  
 3 BOARD MEMBER CONNERY: Excuse me, can I ask a  
 4 question? So I just want to clarify, though, because  
 5 the TRU Waste Program is not a reporting chain from the  
 6 generator sites. So they're both -- it's more of a  
 7 customer service relationship.  
 8 So I understand that that is a good way to send  
 9 information informally that good generator sites will  
 10 adopt because it's in their best interest to do so, but  
 11 there's really no mechanism, as I understand it, for the  
 12 National TRU Program to require anything from the  
 13 generator sites, except for as it applies to the Waste  
 14 Acceptance Criteria. Is that a true statement?  
 15 MR. SHRADER: Yes, but the waste -- the -- as a  
 16 general statement, I agree with that, but the Waste  
 17 Acceptance Criteria can have fairly expansive  
 18 requirements in it. If we truly found an issue that was  
 19 multiple -- was being an issue of multiple sites, we can  
 20 revise the Waste Acceptance Criteria. That is now --  
 21 becomes a requirement for all shipping sites to send to  
 22 us.  
 23 BOARD MEMBER CONNERY: But those requirements  
 24 would only take place prior to shipment, so while that  
 25 waste is at the generator sites, you wouldn't have any

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1 way to influence that?  
 2 MR. SHRADER: Correct. The National TRU  
 3 Program's boundary is at the certified program, not at  
 4 storage at the sites, et cetera.  
 5 BOARD MEMBER CONNERY: Okay, thank you.  
 6 CHAIRMAN HAMILTON: Thank you.  
 7 Ms. Roberson?  
 8 BOARD MEMBER ROBERSON: So I just wanted to  
 9 bound the Generator Site Technical Review process, which  
 10 is a tool that you use, and a good tool, but my  
 11 understanding is it's limited in scope. And so there  
 12 was a technical review done at Idaho before the event,  
 13 and we had the exhibit up, you know, it pointed to  
 14 certain things, but it didn't alert or preclude the  
 15 event.  
 16 So are there improvements planned to that  
 17 process or other augmentation? For instance, is there  
 18 any thought given to independent evaluation for the  
 19 potential of chemical reaction events at generator  
 20 sites?  
 21 MR. SHRADER: The Generator Site Technical  
 22 Review process is a programmatic review, and so it would  
 23 not necessarily detect individual waste stream problems  
 24 or problems in individual drums. But saying that, after  
 25 that event, we are certainly always looking to expand or

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1 improve -- better word -- improve the Generator Site  
 2 Technical Review process.  
 3 I don't have the specifics now to talk about it,  
 4 but if there are areas we can find particularly to  
 5 address common issues around the complex, we would  
 6 certainly bring that into the GSTR process.  
 7 Again, I would also mention, you know, if  
 8 there's common lessons or common issues, we do have the  
 9 more formal processes within the Department that we  
 10 could also engage in, and Mr. Griffin has spoken of  
 11 those, also.  
 12 BOARD MEMBER ROBERSON: Thank you.  
 13 MR. GRIFFIN: If I may add, if I go back to the  
 14 safety alert that they discussed earlier, you know, I  
 15 think it's -- as he outlined, the idea would be that we  
 16 go collect this information, and then go sit down, or  
 17 maybe not sit down, but get with all the sites and  
 18 figure out how this translates into impacts across the  
 19 whole program, including the site technical reviews at  
 20 Generator Site Technical Reviews.  
 21 BOARD MEMBER ROBERSON: So don't turn it off  
 22 yet. So I just want to clarify. You're expecting some  
 23 form of that data in around September. The executive  
 24 leadership is going to look at that, and there may be  
 25 additional processes or requirements as a result of

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1 that. Is that what I understand?  
 2 MR. GRIFFIN: Absolutely.  
 3 BOARD MEMBER ROBERSON: Okay. Thank you.  
 4 MR. GRIFFIN: Did you want to add anything?  
 5 MR. CHUNG: Just the only thing that I did  
 6 mention about not only the required actions, but  
 7 recommended actions. We do have an established process  
 8 for communicating issues. We do have a -- either  
 9 monthly or quarterly site briefings that we have been  
 10 conducting for several years, and we have identified  
 11 that as an example for communicating any issues from  
 12 even this safety alert related information gathering  
 13 effort.  
 14 So that there are multiple mechanisms I believe  
 15 that where the field can let us know what's -- what  
 16 they're finding, as well as the ability for us to be  
 17 able to ask questions. So I just wanted to add that.  
 18 BOARD MEMBER ROBERSON: Thank you.  
 19 MR. WYKA: If I could add as well, at least it  
 20 was mentioned that as the deputy manager for a generator  
 21 site, I found the GSTR reviews very helpful, especially  
 22 looking at the lessons learned from the other reviews  
 23 and improving your programs, because GSTR actually looks  
 24 at, you know, wide area things, such as the Q/A Program,  
 25 a Generator Site Assessment Program, an Issues

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1 Management Program, which is problematic across the  
 2 enterprise, you know, our conduct of operations, as well  
 3 as our Federal oversight. And the Waste Management  
 4 Program itself, including the generation piece, the  
 5 treatment, packaging processes, the permitting aspects,  
 6 and then the hazardous waste determination, all critical  
 7 elements. As well as the deferred maintenance.  
 8 So I found that as a deputy manager useful, not  
 9 only for the TRU Waste Program, but, you know, across  
 10 the site in terms of programmatic pieces that it looked  
 11 at.  
 12 BOARD MEMBER ROBERSON: I appreciate that, and I  
 13 thank you for that, and as I'm sure the rest of the  
 14 Board does, look forward to see what comes of the effort  
 15 you're taking. I guess the only thing I'd say is, yes,  
 16 there has been two events. There's a history of events,  
 17 but I think through this effort, it looks like the  
 18 recognition is, it isn't the event that's the anomaly,  
 19 sometimes it's the waste that's the anomaly, and try and  
 20 figure out how you equip yourself to handle that is very  
 21 important. Thank you.  
 22 CHAIRMAN HAMILTON: Thank you, Ms. Roberson.  
 23 Board Member Connery?  
 24 BOARD MEMBER CONNERY: After the WIPP event,  
 25 there was an extensive Federal accident investigation,

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1 but there wasn't one at Idaho, and the contractor's  
 2 formal causal analysis report does not, and I quote,  
 3 "include an evaluation of DOE's actions or contributions  
 4 to the event. In fact, after our analysis, we believe  
 5 that deficiencies in Standard 5506 could have been a  
 6 contributing factor to the event as well."  
 7 So I'd like to know, now that you've issued the  
 8 safety alert, and I understand we're going to get a lot  
 9 of information that we will find relevant to our  
 10 questions of about a month ago, how are you identifying  
 11 corrective actions for the Department itself, or for  
 12 Idaho ops based on the event, given the fact that you  
 13 didn't do a Federal investigation?  
 14 MR. CHUNG: If I may answer that question.  
 15 Idaho Field Office, along with the EM headquarters, have  
 16 discussed the options at -- that we had in terms of  
 17 whether or not this event, based on the knowledge that  
 18 we had at the time, would trigger an AIB type of  
 19 investigation, or could we do something else.  
 20 So we examined the criteria that are given in  
 21 the governing order, 225.1(b), so we considered those  
 22 factors pretty carefully. It did not trigger any of  
 23 those criteria, including the financial or monetary  
 24 aspect at the time, but both contractors and DOE  
 25 recognized that finding the technical root cause is

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1 going to be an essential part of this -- whether you  
 2 want to call it investigation or review.  
 3 So we decided to have Fluor Idaho to lead the  
 4 investigation, but with a very strong oversight from  
 5 both DOE Idaho and EM headquarters. So that was our  
 6 collective decision at the time.  
 7 And then by working with our contractor, Idaho  
 8 Fluor, we have broken investigation into three different  
 9 groups, if you will. There was a group that focused on  
 10 causes. Also there was a group that evaluated the  
 11 responses from firefighters and whatnot. We also wanted  
 12 to make sure that the corrective action plan,  
 13 development process, was sound and rigorous.  
 14 So, and then Idaho Field Office, under the  
 15 leadership of Jack and Mark Brown, put together very  
 16 strong team on the order of about a dozen SMEs to  
 17 provide individual attention to each one of those  
 18 functional areas I mentioned, the three of them, as well  
 19 as the several important functional areas, including  
 20 root cause analysis, fire protection, work planning and  
 21 control, accident investigation, occupational safety and  
 22 industrial hygiene area, operations, waste management,  
 23 environmental compliance, radiological protection and  
 24 nuclear safety.  
 25 I would say that was pretty thorough coverage in

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1 terms of their oversight. In addition to Idaho's  
2 oversight, EM headquarters provided a significant  
3 oversight. We had had a chief engineer at the time to  
4 very deeply engage in the discussions of the chemical  
5 reactions and the chemistry surrounding the event. We  
6 also provided expertise in nuclear safety, conduct of  
7 operations, and radiation protection.

8 As I mentioned earlier, we also provided, at the  
9 request of the field, and the contractor, very strong  
10 team including industrial experts to look at the Safety  
11 Culture Program. And also, during the development of  
12 the corrective action phase, which took a while, I seem  
13 to recall seeing a draft coming out back in December of  
14 last year, three or four of our headquarters staff  
15 working with Idaho Federal colleagues, we have  
16 extensively reviewed that.

17 I don't know whether the Board has seen the  
18 record of our comments, but it's a very extensive set of  
19 comments which we believe help the contractor to come up  
20 with a pretty good set of corrective actions.

21 The other thing that Idaho and we decided to do,  
22 in terms of looking at Idaho's Federal oversight, two  
23 experts from ORP, Office of River Protection, and one  
24 senior person from EM headquarters, were put together to  
25 look at the Federal Oversight Program at Idaho. They

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1 provided a 30-page report. They basically concluded  
2 that the oversight was adequate; however, they pointed  
3 out certain recommendations which Idaho either have  
4 completed most of them or are in the process of  
5 completing most of those recommended actions.

6 So if you look at the rigor and the depth that  
7 the contractor have done in terms of their technical  
8 root cause and the also resumption effort related  
9 investigative work, I think that was pretty  
10 comprehensive investigation. Along with the DOE  
11 oversight provided by Idaho and EM headquarters, I think  
12 that we have done a pretty good job of not only  
13 identifying root causes, but also all the relevant  
14 contributing causes, as well as pretty responsive  
15 corrective action.

16 MR. WYKA: I'd like to add onto that, if I can,  
17 especially with the experience as the investigation  
18 board chairman for the salt truck fire as well as the  
19 drum event, but probably more importantly with my  
20 current hat as the cognizant secretarial officer for  
21 NNSA, I'm the one that directs the accident  
22 investigations for NNSA.

23 I've had the -- I've had the chance of directing  
24 four actually within the last year, using the DOE  
25 Standard 225.1, and my main trigger for issuing -- to

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1 directing these events is really can we learn anything,  
2 and can we learn anything that's going to, you know,  
3 help the enterprise, not only in NNSA, but the  
4 Department. And there's really no -- there's different  
5 mechanisms to do that.

6 In fact, I've used three different mechanisms in  
7 chartering accident investigations. I've had two where  
8 there were complete Federal teams. I've had one where  
9 it was a combined effort with combined Federal as well  
10 as contractor team, and I had one in which I had the  
11 contractor lead the investigation and I assigned a  
12 Federal monitor, you know, to look at the deliberations  
13 of the investigation, as well as a team to do the  
14 Federal oversight piece from both the contractor as well  
15 as the Federal component. And all four of them have  
16 been just as successful in terms of their rigor and in  
17 terms of the depth, in terms of the conclusions of the  
18 root causes and contributing causes, and all four have  
19 been briefed to the administrator.

20 So there's different mechanisms for doing  
21 accident investigations. The key is management  
22 attention, you know, on these investigations and making  
23 sure that they have the tools to successfully do what  
24 they need to do, without any interference, and that  
25 you're looking at all aspects of it. You know, as well

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1 as all the oversight aspects, both from the contractor,  
2 the parent organizations, as well as Federal  
3 organizations.

4 BOARD MEMBER CONNERY: Thank you. Actually, I  
5 appreciate that explanation. I would just note that the  
6 field office at Idaho, that Federal oversight review  
7 actually took place months before the contractor event  
8 investigation was concluded. So I'm not sure that it  
9 was as helpful because it was completed before the  
10 causes of the Idaho event were thoroughly understood.

11 But when I asked this question originally, and I  
12 asked it back in May of last year to somebody who is no  
13 longer working at EM, I was told that the reason that  
14 they weren't wanting to do that, in addition to the fact  
15 that it didn't reach the financial threshold, was the  
16 fact that they didn't have the Federal resources to  
17 conduct such an event.

18 And so I'm curious as to whether in the event  
19 that there was something else that happened in the  
20 future, would you have the resources? And by that I  
21 mean the talent was I think what that individual was  
22 getting at, in-house, to perform a Federal accident  
23 investigation on the EM side.

24 I understand the capabilities on the NNSA side,  
25 because I came from that, but I don't know whether or

1 not EM, from what I've heard, would have that  
2 capability. And if that was really one of the causes of  
3 not doing a Federal accident investigation, that's  
4 troublesome and we would want to make sure that you do  
5 have the resources to be able to do that in the future.

6 MR. CHUNG: My position at the time of this  
7 particular incident was that I was acting EM-3, as well  
8 as special projects office director, so I was aware of  
9 the incident, and I was engaged with Idaho DOE  
10 leadership in terms of deciding whether or not federally  
11 led AIB would be needed. It wasn't. The lack of  
12 resource was not -- was not a factor at all, as I  
13 recall.

14 So we have -- we have -- we still have enough  
15 talent at headquarters, as well as our field offices, to  
16 be able to conduct very high quality and reliable  
17 investigations. We thought that the method that we  
18 chose would result in a satisfactory investigation, and  
19 more importantly, as Ted said, that we would learn from  
20 it. And then we wanted to make sure that Idaho's  
21 Oversight Program was okay by bringing in ORP colleagues  
22 to look into that. Because that gives them an  
23 opportunity to learn about various processes and  
24 whatnot.

25 BOARD MEMBER CONNERY: Thank you. I appreciate

1 that.

2 CHAIRMAN HAMILTON: Thank you, Board Member  
3 Connery.

4 I would like to address this to you,  
5 Mr. Griffin, and maybe a followup to Mr. Wyka. Let's  
6 talk about current Federal oversight at the generator  
7 sites.

8 (Exhibit Number 7 was entered into the record.)

9 CHAIRMAN HAMILTON: I'd like to enter Exhibit 7  
10 into the record, and I'll pause so you can read it.

11 This exhibit notes continued heavy reliance on  
12 your facilities representatives to conduct Federal  
13 oversight to protect the Waste Isolation Pilot Plant,  
14 including oversight of chemical reaction hazards. So  
15 could you please discuss whether you think the  
16 facilities representatives are the appropriate personnel  
17 to provide oversight of the chemical reaction hazards,  
18 and maybe expand that to talk about whether you need  
19 other Federal subject matter experts to perform this  
20 oversight.

21 MR. GRIFFIN: Yeah, I'll do what I can. So I  
22 have to say that I've been within the Department for  
23 eight months, so some of this precedes me, but then also  
24 that does provide a perspective, right, from coming from  
25 outside a National Lab background.

1 And so I have to go back and echo what Mr. Chung  
2 was talking about. My sense, and I have -- you know,  
3 this is one of those areas in my current  
4 responsibilities that I have -- would have great  
5 concerns over. My sense is that we do have a very  
6 strong technically capable organization that has the  
7 capabilities to do the kind of work we're asking them to  
8 do at these sites relative to at the sites and the  
9 complex as a whole relative to the National TRU Program,  
10 the generator sites and the Carlsbad Field Office. It's  
11 a well trained staff, it's -- they're generally very  
12 familiar with the issues. They are qualified.

13 So, and we have technical resources, great  
14 technical resources within -- not independent, but  
15 within the contractors as well as the National Labs, and  
16 we don't hesitate to draw those resources in.

17 So I don't have a great many concerns in that  
18 particular area. I mean, you're always concerned about  
19 an organization and managing it for the future, and so,  
20 of course, that's something that we continue to talk  
21 about. Relative to this specific question, I am not  
22 sure that I can speak very knowledgeable about it. I'd  
23 ask Dae or Todd if they want to.

24 CHAIRMAN HAMILTON: Before you do, and I'll let  
25 them do that, but before you do, and I understand eight

1 months on the job, but also understand that sometimes a  
2 new broom sweeps cleaner, so again, one of those  
3 balancing things. Have you ever considered updating the  
4 qualification requirements for any of these Federal  
5 positions? Is that -- and a yes/no could be the answer.

6 MR. GRIFFIN: I think those kind of discussions  
7 are on the table, and so we'll be looking at that.

8 CHAIRMAN HAMILTON: And I'll go ahead and open  
9 it up to Mr. Chung and Mr. Wyka. Go ahead.

10 MR. WYKA: Let me address it from the NNSA  
11 perspective.

12 CHAIRMAN HAMILTON: Sure, go ahead.

13 MR. WYKA: Because this is a very important  
14 question, and it's a question that deals with everything  
15 that happens right and everything that happens wrong,  
16 whether it's waste management or whether it's a shipping  
17 container that shuts things down for a prolonged period  
18 of time, and, of course, all of that sort of affects  
19 mission.

20 You know, so let me sort of discuss in terms of  
21 the quote up there, the facility representatives, great  
22 individuals, very well qualified, they are the trip  
23 wires of our Oversight Program to identify, you know,  
24 issues, and they're there because they have that  
25 questioning attitude, and very, very valuable. Very

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1 valuable to me as a deputy manager at Los Alamos, as  
 2 well as as the CSO.  
 3 But for this -- for oversight was a really basis  
 4 for your question, and you have to really look at it at  
 5 all levels. And I'll try to talk philosophically from  
 6 an NNSA perspective and the Technical Qualification  
 7 Program, is a big key with that as well, so focusing on  
 8 the waste management activities.  
 9 As you know, I think you were briefed on it,  
 10 NNSA has developed a safety roadmap. There's nothing  
 11 really new in that roadmap, it's really a collection of  
 12 things that we have developed, you know, sort of as a  
 13 department, and we are working on oversight process  
 14 improvements employed with our management and operating  
 15 contractors, you know, through this roadmap. So it's  
 16 something that we're building together.  
 17 Recognizing the limited resources that we have,  
 18 and, you know, also resource challenges on the M&O  
 19 contractor's side, especially with our increased mission  
 20 growth. You know, the key to most initiatives of this  
 21 roadmap, and again, this is a higher tier before getting  
 22 down to the Waste Management Program, but it applies.  
 23 You know, standardizing the Process and Technical  
 24 Qualification Program, which as well as the safety  
 25 management -- the safety bases review processes and the

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1 specific way we do those things.  
 2 We're working towards a, first of all, NNSA  
 3 enterprise-wide TQP Accreditation Program, rather than  
 4 accrediting individual sites, we're trying to accredit  
 5 an entire NNSA program, program offices as well as site  
 6 offices, to maintain and ensure we had the base  
 7 technical qualifications to do our respective jobs.  
 8 And also, using the safety bases review teams to  
 9 leverage the Federal resources across the enterprise for  
 10 consistency. And that's really valuable, especially for  
 11 me as a deputy manager, looking back, because you have  
 12 the opportunity to use resources across the enterprise  
 13 to look at your safety bases issues so that you don't  
 14 have the same eyes looking at the same issue over and  
 15 over again. So it's even if you had unlimited  
 16 resources, I would still want the use of, you know,  
 17 resources from other sites to help us in that area.  
 18 Roadmap also uses modern tools and data science  
 19 and integration to organize information for  
 20 accessibility and transparency, and that's going to be  
 21 the key is the data analytics piece, recognizing, you  
 22 know, with our resource limitations, to be able to add  
 23 transparency to that flow of information, you know, from  
 24 the M&O contractor to the field office to the  
 25 headquarters, and across the enterprise is very

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1 valuable. It's very valuable in our infrastructure  
 2 program, where we built that trust where we share  
 3 information. The same thing on the safety side, which,  
 4 again, gets into the oversight of activities.  
 5 And then employing correct visual management  
 6 tools, the metrics, you know, and working  
 7 collaboratively, not only with the field office, as well  
 8 as the M&Os, to develop what are those critical metrics  
 9 that tells you something about performance, the  
 10 confidence in the information, risk and consequences.  
 11 And something that we're using as a team to leverage the  
 12 resources across the enterprise to swarm those issues  
 13 where we need to swarm them.  
 14 TQP, as I mentioned, we're working towards an  
 15 enterprise accreditation, and this is, again, to ensure  
 16 consistency of the technical capabilities for employees  
 17 in their technical disciplines, as well as enhance the  
 18 passdown of acquired knowledge from senior staff. You  
 19 know, especially with our retirements, of losing folks,  
 20 it's very important, you know, to have a strong base  
 21 program like that.  
 22 This accreditation program is going to include  
 23 an independent review of the NNSA programs, confirming  
 24 that we've established a qualified training program,  
 25 qualified trainers, that we have a strong oversight in a

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1 program and formal feedback evaluating M&O performance  
 2 within our Technical Qualification Program. And that  
 3 will be done by an independent office by AU.  
 4 We did a self assessment already, we're doing  
 5 pretty good in terms of field offices. Headquarters  
 6 we're making significant improvements. We'll be ready  
 7 for accreditation by about the August time frame.  
 8 Now, implementing NNSA governance, which is the  
 9 next piece of that, you know, after the roadmap, is, you  
 10 know, is the governance, which we have been implementing  
 11 since 2017. I know the Board has been briefed on that.  
 12 And NNSA continues to implement and mature its Site  
 13 Governance Program in accordance with 226.1(d).  
 14 The governance is to set expectations for M&Os,  
 15 field offices, program offices, functional offices that  
 16 govern our nuclear sites and to leverage the M&O  
 17 assurance systems, contractor assurance systems,  
 18 enabling Federal oversight so that we can focus on the  
 19 high-risk activities, including the waste management and  
 20 the National TRU Program. And this is, I think,  
 21 resulting in more effective M&O performance and Federal  
 22 oversight. You know, so that's the higher type layers.  
 23 Looking at the TRU Program itself for TRU waste  
 24 activities taking place at the generator sites,  
 25 increased emphasis is placed on assurance, that the WIPP

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1 WAC would be met prior to receipt of waste at WIPP. And  
2 parts of this assurance is enhanced by the chemical  
3 capabilities, evaluations that was previously mentioned,  
4 the added emphasis on basis of knowledge, which is a key  
5 piece of our collective enhanced AK Program, and  
6 enhanced reviews and oversight of the certification of  
7 WIPP prior to shipment to WIPP.

8 And at the generator sites. This also includes  
9 appropriate preparation of activities at the generator  
10 sites, appropriate hazard evaluations, establishment of  
11 controls to protect the activities at the generator  
12 sites. And we have a team at, you know, not only at  
13 headquarters, but our field offices, and we use our TQP  
14 Program to make sure they have the required base  
15 knowledge for doing the jobs that they're doing, as well  
16 as transferring a lot of experience, you know, from  
17 those that we have in place now to, you know, the staff  
18 as they come in.

19 CHAIRMAN HAMILTON: Okay, thank you.

20 MR. WYKA: So it's a -- it's not just facility  
21 representatives, it has to be the entire program, and  
22 the facility representatives are a key piece of that  
23 program.

24 CHAIRMAN HAMILTON: Thank you. Very briefly,  
25 and I want to put up the second slide here, and just let

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1 you have an opportunity to look at it.

2 And I don't present this as some type of a  
3 'gotcha,' my point is that 2015, this was shown to be a  
4 problem -- challenge, and then here in March of this  
5 past year, we see the same sort of thing. So three  
6 years later, you still have these continued weaknesses,  
7 and I recognize what you just said about the process and  
8 practice that you've got going on. Is there anything  
9 else that you specifically want to address this  
10 three-year lack of a positive trend?

11 MR. WYKA: Thank you for the question, good  
12 question. This is where you need the system, and you  
13 need a questioning attitude. Because the facility  
14 representatives don't have to be chemical experts to  
15 stop these incidences, because if you look at the  
16 contributing causes, most of them were, you know,  
17 decisions being made, you know, that weren't well  
18 thought out. Changes in procedures without appropriate  
19 reviews, changing constituents, you know, and pieces  
20 going into the drum without the appropriate reviews.  
21 And these are all the questioning attitude.

22 So by establishing that environment of the  
23 facility representative, again, stop, pause, question,  
24 maybe without being the -- you know, the technical  
25 expert on the chemical compatibility issues, but it's

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1 them doing their normal job. It's creating that  
2 environment from the top down, and if I went through all  
3 the layers of oversight to allow them to make those  
4 calls on a -- you know, on the field, to be able to make  
5 those questions; to, you know, look at changes in  
6 procedures that haven't been reviewed by appropriate  
7 sources.

8 CHAIRMAN HAMILTON: Thank you. I think that's  
9 sufficient to address my question.

10 Did you want to add, Ms. Roberson?

11 BOARD MEMBER ROBERSON: Well, I wanted to push  
12 back just a little bit. I understand what you just  
13 said, Mr. Wyka, but I would say, even a change in  
14 procedure, I mean, to some degree, these events do  
15 require a certain degree of sophistication and  
16 understanding chemical interactions, and I would say you  
17 are a very talented and very smart facility rep, but it  
18 isn't just them being on the front lines, it's who's to  
19 back them up. Who are they to call? Who are those  
20 people and where are they?

21 MR. WYKA: You're absolutely right, and I'm glad  
22 you made that clarification, because it's the team. You  
23 know, again, the facility representatives are those  
24 that, you know, sort of see, smell, hear different  
25 things that they may call into question, and they need

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1 to have somebody to go to. You know, subject matter  
2 experts in those areas, whether it's an electrical  
3 safety event, whether it's a chemical compatibility  
4 event or whatever to go to, you know, have -- to allow  
5 the team to drill down on, you know, these issues  
6 identified by the facility representative.

7 But the facility representatives themselves is  
8 what I was trying to -- you know, sort of it doesn't  
9 necessarily need to be an expert in every area, they  
10 just need to have a mature questioning attitude to take  
11 it to, you know, an expert that, you know, they have  
12 available to them. And it doesn't necessarily need to  
13 be at the site. It could be, you know, at another site  
14 where we leveraged resources, where appropriate, or as  
15 well as at headquarters to, you know, drill down on a  
16 specific area or issue that was identified.

17 CHAIRMAN HAMILTON: Do any Board members have  
18 any last questions for the panel before we take a break?  
19 (No response.)

20 CHAIRMAN HAMILTON: Seeing none, thank you very  
21 much for this first session. We're going to take a  
22 15-minute break and restart at 2:05. I'll point out  
23 that the clocks in this room appear to be a couple of  
24 minutes slow. So just look at your phone. We will  
25 recess now for 15 minutes. Thank you.

1 (Whereupon, there was a recess in the  
 2 proceedings.)  
 3 CHAIRMAN HAMILTON: At this time I would like to  
 4 reconvene our hearing for session 2. In session 1, we  
 5 failed to enter into one exhibit into the record, it was  
 6 Exhibit Number 6, so I'm entering that exhibit into the  
 7 record now. Did we already show it?  
 8 BOARD MEMBER CONNERY: We did show it.  
 9 (Exhibit Number 6 was entered into the record.)  
 10 CHAIRMAN HAMILTON: Thank you. So Exhibit 6 is  
 11 formally entered into the record.  
 12 Our goal for this panel is to gather information  
 13 on safety controls to address the vulnerabilities  
 14 associated with handling and processing solid nuclear  
 15 wastes at Defense Nuclear Facilities. Our panel is the  
 16 same as it was for session 1, except that instead of  
 17 Mr. Todd Shrader, we have Mr. Jack Zimmerman. Welcome.  
 18 Mr. Zimmerman is the Deputy Manager for the Idaho  
 19 Cleanup Project at the Office of Environmental  
 20 Management. Thank you. Thank you for being here.  
 21 I am going to start out again with our technical  
 22 director, Mr. Roscetti. During the first session of the  
 23 public hearing, we discussed the programmatic  
 24 requirements and the Federal oversight responsibilities  
 25 for solid nuclear waste. So this second session will

1 focus on operational execution and safety controls for  
 2 processing solid nuclear wastes at individual sites.  
 3 Would you please provide an overview of the Department's  
 4 response to the February 14th, 2014 Waste Isolation  
 5 Pilot Plant accident?  
 6 MR. ROSCETTI: Yes, sir. Mr. Griffin provided  
 7 some of that information in his opening statement, but I  
 8 will try and summarize more here.  
 9 In response to the WIPP radiological release,  
 10 the Department conducted a comprehensive accident  
 11 investigation that identified multiple judgments of  
 12 need. Several judgments of need were related to  
 13 strengthening confidence that waste is adequately  
 14 characterized and compatible from a chemistry  
 15 perspective. The Department's primary corrective  
 16 actions in this regard are more rigorous activities and  
 17 processes to ensure that the waste being shipped to WIPP  
 18 is acceptable to WIPP.  
 19 Even before the February 2014 event, WIPP had a  
 20 document called the Waste Acceptance Criteria, or WAC,  
 21 WIPP WAC, which defined the requirements for sending  
 22 waste to WIPP. Following the February 2014 radiological  
 23 release event, the Department made some improvements to  
 24 the Waste Acceptance Criteria. These improvements  
 25 included measures to collect better data about the waste

1 being shipped to WIPP.  
 2 The Department now uses this information to  
 3 perform an enhanced chemical compatibility evaluation.  
 4 The Waste Acceptance Criteria must be met before waste  
 5 can be certified for shipment to WIPP. However, this  
 6 means the generator sites may handle and store waste  
 7 containers for extended periods of time prior to  
 8 demonstrating that the waste contents meet the new  
 9 requirements.  
 10 During this period of time, the generator sites  
 11 rely on their own processes to ensure chemically  
 12 compatible waste. Finally, as we discussed in the first  
 13 session, the Department also initiated the Generator  
 14 Site Technical Reviews, or GSTRs, following the WIPP  
 15 event.  
 16 CHAIRMAN HAMILTON: Thank you, Mr. Roscetti.  
 17 Board Member Connery?  
 18 BOARD MEMBER CONNERY: Thank you. Mr. Roscetti  
 19 just described that the environmental management  
 20 generator sites are required to the Waste Acceptance  
 21 Criteria -- the WIPP WAC, before shipping waste to the  
 22 Waste Isolation Pilot Plant. Mr. Griffin, we've heard  
 23 both in the first session and in Chris' description  
 24 about the WIPP WAC and those criteria. Can you describe  
 25 any other significant measures that were taken by the

1 Department of Environmental Management generator sites  
 2 in response to the WIPP accident for the purposes of  
 3 preventing accidents at those sites? So not at WIPP,  
 4 but at those sites.  
 5 MR. GRIFFIN: Well, yeah, I think actually, some  
 6 of this was covered when Mr. -- in the earlier session  
 7 when Mr. Shrader talked about kind of the -- and I  
 8 mentioned also the comprehensive set of activities that  
 9 we put in place.  
 10 So, you know, we have the -- as you discussed --  
 11 was just outlined by Mr. Roscetti, the WIPP WAC, and  
 12 then we have the Generator Site Technical Reviews that  
 13 we put into place, and the certifications, the Strength  
 14 and Certification Program with enhanced chemical  
 15 compatibility evaluations, the acceptable knowledge --  
 16 enhanced acceptable knowledge, enhanced basis of  
 17 knowledge for this.  
 18 So I believe that we pretty well covered all  
 19 that. I don't know whether Mr. Zimmerman would like to  
 20 add more to that based on his experience of being at a  
 21 generator site.  
 22 MR. ZIMMERMAN: I can speak to some of the  
 23 actions taken at the Idaho site, in particular, and I  
 24 imagine many of the other sites did something similar,  
 25 because as I recall, there was some guidance from

1 headquarters at the time to take the Accident  
2 Investigation Board Report from the WIPP accident and  
3 basically evaluate that for your site and look at what  
4 the appropriate actions are.

5 So primarily, you know, for Idaho, we directed  
6 the contractor to review the report and conduct an  
7 extent of condition review as it applied to their  
8 activities, and take the appropriate actions to prevent  
9 recurrence of, you know, similar type events.

10 In Idaho, the response from at the time we had  
11 two contractors, because the mission was kind of split.  
12 So it went to Idaho Treatment Group, who was primarily  
13 dealing with the stored above-ground transuranic waste,  
14 and also CWI, who was the contractor responsible for the  
15 buried waste.

16 Both of them largely came up with some of the  
17 same set of actions, but for Idaho, it was really  
18 focused on strengthening the procedures that would  
19 prevent the inadvertent addition of incompatible  
20 materials, similar to the root cause of the WIPP event.  
21 And additionally, they continued efforts to ensure that  
22 they had strong employee safety effort through the  
23 Voluntary Protection Program, as well as periodic  
24 evaluations of their safety culture.

25 Also, as part of that, you know, initiative,

1 whether or not additional controls or Defense-in-Depth  
2 were put into place because of the potential for that  
3 type of release?

4 MR. ZIMMERMAN: Yeah, we were already using  
5 conservative release fraction values that were  
6 consistent with the larger numbers that were  
7 recommended, so there were ultimately no changes in the  
8 consequences of the evaluated events in Idaho.

9 BOARD MEMBER CONNERY: Mr. Griffin, can you  
10 address it for other sites across the Environmental  
11 Management Program?

12 MR. GRIFFIN: I think as I said earlier, that  
13 some of this precedes, I do not have good insight into  
14 the thinking that occurred at that time, so -- back to  
15 2014. So rather than trying to speak out of school on  
16 that, I'd really rather to defer to Dae on that.

17 MR. CHUNG: I was also absent from those days  
18 when folks were busy working on the --  
19 (Laughter.)

20 MR. CHUNG: Anyways, but having read most of the  
21 lessons learned documents, including the operating  
22 experience, the letter of recommendations and various  
23 responses from the sites that were asked to evaluate  
24 potential impact, particularly with, you know, nitrate  
25 salt being commingled with organic absorbance and

1 they made sure that they communicated the results of the  
2 WIPP event, so they basically educated the workforce on  
3 what happened and what the consequences were so that  
4 there was a general employee awareness associated with  
5 that.

6 And with Fluor Idaho, I mean, they continued to  
7 maintain VPP STAR status site, and they also conducted a  
8 safety culture assist visit that really found a strong  
9 safety culture at the site. But what that really did is  
10 prove that really just one weak link in your safety  
11 culture can have very significant impacts.

12 BOARD MEMBER CONNERY: So just to follow on, in  
13 the first session we talked about the WIPP event  
14 basically showed the magnitude of the release could be  
15 greater than postulated and greater than previously  
16 expected. So logic tells us that if DOE sites analyzed  
17 the larger releases for postulated events, then the  
18 estimated consequences could have driven them to  
19 implement greater controls.

20 And specifically, I'm talking about the release  
21 fraction that wasn't necessarily adopted in the safety  
22 bases across the sites, they were at least adopted at  
23 WIPP and maybe one or two other EM sites.

24 So can you talk about why or whether it was  
25 considered to update those release parameters and

1 whatnot. The two, as I mentioned earlier, there were  
2 two sites that responded positively, WIPP obviously, but  
3 also Los Alamos. So those two sites are where they have  
4 applied the value for both airborne release fraction  
5 times, respirable fraction of 0.205, which is greater  
6 than what had been typically used in the complex. So  
7 that was corrected at those two sites.

8 The rest of sites responded negatively in terms  
9 of the need to apply higher release fractions. Having  
10 said that, having said that, if you look at -- I'm sure  
11 we're going to get into more details on ARP V event, but  
12 not only are the potential consequences important, but,  
13 you know, what is estimated frequency or likelihood of  
14 chemical reactions or deflagrations or  
15 overpressurization events could occur.

16 So that comes into play in terms of selecting  
17 your safety significant controls. Because typically,  
18 typically, when you go through hazard analysis process,  
19 and you're looking for those bounding/representative  
20 scenarios, you go through what is known as a risk  
21 meaning process. So where they look at the likelihood  
22 of certain event happening as well as the potential  
23 consequences.

24 So in the case of ARP, the ARP event, the  
25 consequence was evaluated to be still bounding; however,



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1 if they through their PISA and USBD process, and  
2 associated safety evaluation process, they identified  
3 that that type of event could occur more frequently. So  
4 they changed from unlikely, to anticipated, however,  
5 because of the fact that they already screened in from  
6 the previous analysis, they didn't have to change the  
7 safety bases level controls based on the risk meaning.

8 However, as Jack may want to talk about in more  
9 detail, but they did add, as part of TSR, a couple of  
10 programmatic or specific admin controls to restrict the  
11 operations so that they can deal with a potential  
12 pyrophoric and other types of chemical reactions in a  
13 much more reliable manner.

14 So that's how I think we had learned lessons  
15 from both WIPP event as well as the ARP V event, in  
16 terms of release fractions, as well as, you know, how do  
17 we make sure that we end up setting the right set of  
18 controls through the hazard identification and analysis  
19 process.

20 BOARD MEMBER CONNERY: I understand, I  
21 understand what you just said because I've been studying  
22 this for a while, but just as we go through this, it  
23 would be helpful if you note when those changes were  
24 introduced, because the changes that you spoke of were  
25 introduced after the -- some of them were introduced

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1 after the Idaho incident, so they were not preventative  
2 of the Idaho incident because they didn't exist until  
3 after the Idaho incident.

4 So I would just be very careful of the timeline  
5 of this, because that's what we're trying to get at is  
6 why after the WIPP event some of these precautions  
7 weren't put into place, some of these release fractions  
8 weren't taken into consideration that could have  
9 prevented and mitigated the accident.

10 So if you're speaking in generalizations of  
11 things that are put in place after, that doesn't really  
12 help the conversation.

13 MR. CHUNG: My point being that the operating  
14 experience document specifically identified nitrate salt  
15 issue, okay? So that that was distributed throughout  
16 the complex. I do believe that the generator sites have  
17 adequately responded to the OE concerns.

18 Having said that, if you look at the 5506  
19 standard, it does -- it does say that you need to  
20 evaluate certain accident types. They were selected  
21 deterministically, not based on -- not necessarily based  
22 on significant level of hazard investigations or  
23 analysis. We decided that these are the typical types  
24 of accident types that you must re-analyze. Container  
25 deflagration, multiple container deflagration,

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1 pressurization events. They were told to analyze those,  
2 regardless of likelihoodness from a consequence  
3 determination standpoint. That was the philosophy that  
4 was built into that standard.

5 And then basically applying the release fraction  
6 data that had been used for a long time, you know, 3010  
7 handbook, was basically brought into that 5506 standard  
8 as a standard means of selecting or using a release  
9 fraction related data.

10 So it was the fact that we have learned from the  
11 very chemical -- the very chemical reaction phenomenon  
12 from the WIPP, I think the Department did the right  
13 thing by telling the complex that you've got to be  
14 careful in terms of the nitrate salt and other organics.

15 So that was dealt properly in terms of using the  
16 higher release fraction, but that does not necessarily  
17 mean that the standard had to be revised.

18 BOARD MEMBER CONNERY: You're in the middle of  
19 revising the handbook right now, aren't you?

20 MR. CHUNG: Yes, but not just because of that.

21 BOARD MEMBER CONNERY: Mr. Roscetti?

22 MR. ROSCETTI: So I would just like to make a  
23 point from the Board's staff perspective, because we're  
24 talking about WIPP and nitrate salts and we're talking  
25 about Idaho and overpressurization, potentially

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1 deflagration, and we're talking about the release  
2 fraction.

3 So for people who may not understand, when we're  
4 talking about a drum, there's a certain amount of  
5 material that's in a drum. The release fraction is a  
6 value that is used to calculate how much material  
7 potentially could come out of that drum given an  
8 accident.

9 So whether it's nitrate salts or whether it's an  
10 overpressurization event, if you're using a smaller  
11 release fraction, you're estimating that the amount of  
12 material coming out of that drum in an accident is going  
13 to be less than if you're using a larger release  
14 fraction.

15 So from the Board's staff perspective, we're  
16 looking at across the complex, regardless of the cause,  
17 whether the Department is using an appropriate release  
18 fraction to estimate the amount -- appropriate amount of  
19 material potentially coming out of a drum in an  
20 accident.

21 BOARD MEMBER CONNERY: Thanks, Mr. Roscetti for  
22 that clarification.

23 I'm going to yield my time back to you all since  
24 I'm not seeming to make any progress right now.

25 CHAIRMAN HAMILTON: Ms. Roberson?

1 BOARD MEMBER ROBERSON: So I'll just add one  
2 comment, and Mr. Roscetti can certainly jump in. You  
3 know, the airborne release fraction we're talking about  
4 0.205 is not our number now, that's the Department's  
5 number. So we're still, as Mr. Roscetti said, we're  
6 still looking, but we don't know if that's the right  
7 number or not. And it is very limited.

8 But taking the same question and going to NNSA,  
9 you talked to us earlier about something you've done  
10 since the Idaho event. What did NNSA do or what kind of  
11 direction did it provide to its generator sites in  
12 response to the Waste Isolation Pilot Plant accident for  
13 the purpose of preventing or mitigating accidents at  
14 those sites?

15 MR. WYKA: Thank you, ma'am.

16 We did, you know, extensive training, obviously,  
17 on the root causes, all the contributing causes, all the  
18 programmatic breakdowns and process and procedure  
19 oversight, but specifically, like for Los Alamos, you  
20 know, the safety bases documents, all the safety bases  
21 documents were evaluated and revised for the remediated  
22 nitrate salt containers. We went through and RNS drum  
23 campaign for about, you know, six to eight months and  
24 was able to remediate successfully without incident all  
25 of those drums.

1 The WCRRF facility implemented restrictions on  
2 the use of organic kitty litter to prevent an exothermic  
3 reaction. Significant operational control improvements  
4 were made, including renewed attention to procedures,  
5 ensuring compliance with the WIPP WAC during drum  
6 filling, as well as validation of contents through  
7 records, verification prior to shipping at the LANL, a  
8 lot of significant safety bases changes in retrieval,  
9 transportation, processing of RNS drums, containers and  
10 the use of a suite of safety controls that were used to  
11 prevent a similar type reaction.

12 The other type of thing we learned from the --  
13 and what was changed as you go to Phase 2 review, was  
14 the uncertainty of the AFR with the values with respect  
15 to POCS. I think that was a collaborative success story  
16 over the last couple of years where we did significant  
17 or subsequent fire tests completed at Sandia on tested  
18 filters, which ultimately determined where the DR was  
19 ultimately determined to be zero. The new filters were  
20 manufactured and made available at Los Alamos. I think  
21 we replaced 740. We have about 124 to go. We've  
22 completed all 50 -- 150 changeouts at Livermore, 150.

23 So with the new filters in place, all the  
24 parameters used in the five-factor formula for  
25 calculating those consequences in the Standard 5506 are

1 correct. In fact, we're in the process now of beginning  
2 shipment of some of those POCS containers which, again,  
3 will have a significant mission impact for NNSA.

4 BOARD MEMBER ROBERSON: So how many NNSA  
5 facilities have revised their safety bases to account  
6 for the increased magnitude of release from an energetic  
7 chemical reaction?

8 MR. WYKA: The only one that had to was Los  
9 Alamos. The others looked at their processes, they  
10 looked at their procedures, safety bases in place, and,  
11 you know, there weren't any changes needed. It was only  
12 Los Alamos that needed to change theirs.

13 BOARD MEMBER ROBERSON: So you guys have  
14 confirmed no other site needed to make any adjustment?

15 MR. WYKA: Yes, ma'am.

16 BOARD MEMBER ROBERSON: Okay. Thank you.

17 CHAIRMAN HAMILTON: Thank you, Ms. Roberson.

18 Mr. Roscetti, you mentioned earlier that after  
19 the WIPP event, the Department began to rely on enhanced  
20 chemical compatibility evaluations to understand the  
21 potential reactions in the waste drums. Could you  
22 summarize these evaluations and the staff's views on the  
23 challenges involving the execution of them?

24 MR. ROSCETTI: Yes, sir. Before waste can be  
25 shipped to WIPP, the Department now requires an enhanced

1 chemical compatibility evaluation. This type of  
2 evaluation is important because it helps the Department  
3 identify hazards which would then allow the Department  
4 to devise strategies to prevent undesired chemical  
5 reactions.

6 (Exhibit Number 8 was entered into the record.)

7 MR. ROSCETTI: I would like to enter Exhibit 8  
8 into the record. The Department's enhanced chemical  
9 compatibility evaluation is based on a method published  
10 by the Environmental Protection Agency in 1980 as  
11 described in Exhibit 8. The EPA document describes a  
12 method for determining whether the waste could be  
13 involved in undesired chemical reactions.

14 CHAIRMAN HAMILTON: Take a breath and let's --  
15 so we can read this here.

16 MR. ROSCETTI: Okay, sir.

17 CHAIRMAN HAMILTON: Okay, go ahead.

18 MR. ROSCETTI: So the authors of the EPA  
19 document performed a survey of accidents involving  
20 undesired chemical reactions in hazardous wastes. They  
21 found that one of the primary causes of these accidents  
22 was insufficient or inaccurate information about the  
23 waste contents. Accordingly, the EPA's method starts  
24 with collecting as much information as possible about  
25 the waste and listing which chemicals are included.

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1 The EPA document then provides methodology to  
 2 determine if combinations of any two chemical types  
 3 could lead to undesired consequences such as a fire,  
 4 explosion or the generation of flammable gases. The  
 5 purpose of the Department's evaluation is to provide  
 6 some confidence that inappropriate waste is not sent to  
 7 WIPP. The evaluation requirement is not designed to  
 8 ensure safety at the generator sites where the waste is  
 9 generated, processed, and/or temporarily stored.

10 The Board's staff has identified challenges with  
 11 performing chemical compatibility evaluations in wastes.  
 12 Some are of these are listed on the second slide of  
 13 Exhibit 8.

14 One challenge with performing chemical  
 15 compatibility evaluations is the uncertainty regarding  
 16 the chemical composition of legacy wastes, which we  
 17 heard either Mr. Shrader, I believe it was Mr. Shrader  
 18 talk about in the first session.

19 Consider the waste buried at Idaho. Some of  
 20 these wastes were buried in the 1950s and 1960s, and the  
 21 documentation about them is not complete or does not  
 22 exist. The wastes are also from a wide variety of  
 23 sources and generating processes. While the Department  
 24 and its contractors have worked very hard to collect as  
 25 much historical information and records as they can,

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1 gaps still remain.

2 As an example, the Department's contractor found  
 3 that a chemical, beryllium carbide, could have played a  
 4 role in the 2018 Idaho drum event. Before the event,  
 5 beryllium carbide did not appear on the Department's  
 6 list of chemicals that could be in the Idaho waste.

7 Another challenge is determining whether to  
 8 analyze so-called trace chemicals. The WIPP Waste  
 9 Acceptance Criteria, or WIPP WAC, allows for trace  
 10 chemicals to be excluded from the chemical compatibility  
 11 evaluation with documented justification. However, if  
 12 any chemicals are inappropriately excluded, important  
 13 chemical interactions could go unidentified.

14 Finally, chemical compatibility evaluations are  
 15 not an end in themselves. If the evaluation identifies  
 16 potential hazards, it requires the Department to take  
 17 further actions to address those hazards by implementing  
 18 controls and/or treating the waste.

19 CHAIRMAN HAMILTON: Thank you, Mr. Roscetti.  
 20 Ms. Roberson?

21 BOARD MEMBER ROBERSON: Thank you, Mr. Chairman.  
 22 So, Mr. Chung, Mr. Roscetti just highlighted the  
 23 uncertainty associated with composition of legacy  
 24 wastes. Can you describe the Department's -- how the  
 25 Department accounts for limited knowledge when analyzing

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1 hazards associated with this waste?

2 MR. CHUNG: Sure. Dealing with uncertainties  
 3 with respect to how we perform hazards or accident  
 4 analysis is not unique to solid waste mission elements.  
 5 We have wrestled with this issue for a long time, even  
 6 with tank waste in terms of chemicals and whatnot.

7 So at the onset of the formation of our safety  
 8 bases methodology, which goes back to early '90s, we  
 9 recognize that we have to develop a set of what I would  
 10 consider deterministically driven accident types as a  
 11 starting point. In other words, we would -- we would so  
 12 designate certain types of accidents to be analyzed,  
 13 realizing that we are dealing with certain degree of  
 14 uncertainties in terms of having -- in terms of being  
 15 able to correctly and accurately identify hazards.  
 16 Because you will only know as much as you would know  
 17 based on the knowledge.

18 So with that methodology, we also felt that it  
 19 is still important to do a bottoms-up type of hazard  
 20 analysis. So you do walkdowns. You look at the circle  
 21 data. You interview. So you try to gather as much  
 22 information as possible in terms of being able to  
 23 perform the hazard identification accurately.

24 And then you start to roll up in terms of -- so  
 25 of all these hazards, you know, how can we -- how can we

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1 group them or categorize them into a certain set of  
 2 potential hazard events or accident scenarios so that we  
 3 can come up with a reasonable set of controls, both  
 4 preventive, mitigative, including Defense-in-Depth,  
 5 including safety management programs, to be able to come  
 6 up with that set of controls that we can rely on for  
 7 provision of adequate protection.

8 So in terms of the solid waste or TRU waste, we  
 9 have come up with what we thought was very reasonably  
 10 bounding material risk formulation, 10, 12 years ago, in  
 11 terms of providing that additional margin of safety  
 12 right up front in terms of estimating that material  
 13 risk.

14 We have historically proven that the things like  
 15 release fractions and respirable fraction values  
 16 contained in DOE Handbook 3010 were conservative. We  
 17 also have demonstrated over the years that not only the  
 18 five-factor formulation, which also includes damage  
 19 ratios, but dispersion modeling, whether it's for public  
 20 boundary type of air dispersion calculation or enclosed  
 21 for collocated worker, we have chosen a very  
 22 conservative set of dispersion parameters.

23 So when you look at the totality of our accident  
 24 analysis, from a consequence determination standpoint,  
 25 that we felt that our methodology is very conservative,

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1 right? So the uncertainty aspect in terms of the waste  
2 characterization, we have assumed that our overall  
3 accident analysis methodology would be still  
4 conservative enough to be able to develop adequate set  
5 of controls.

6 BOARD MEMBER ROBERSON: Okay. So let me -- and  
7 if this isn't -- if you're not the right person to  
8 answer this, I'm happy for anybody on the panel. So  
9 some of the things we're paying attention to, for  
10 instance, I'm not going to say I'm not implying that it  
11 caused the event at Idaho, but the commingling of waste  
12 would be one of those phenomena. Things that are done  
13 in the process of handling the waste, you know, additive  
14 at Los Alamos.

15 At the end of the day, because I agree with you,  
16 and I love modeling, but at the end of the day, it's the  
17 waste. So something that Mr. Shrader said earlier when  
18 I asked him, you know, how does WIPP handle accepting  
19 questionable or difficult waste, and he said at the end  
20 of the day, there's sampling and analysis, which the  
21 Department used to do a lot, but stopped doing because  
22 of the cost benefit.

23 What's the trip wire for just analyzing the  
24 waste?

25 MR. CHUNG: As Mr. Shrader pointed out that

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1 sampling could be done, as a last resort, but if we make  
2 that as a standard method for so-called every unknown  
3 waste stream, that even sampling activities themselves  
4 bring about certain level of risk for our workers.

5 So I think we have to carefully examine when we  
6 really need to do a sampling. At the same time, as part  
7 of our revision efforts or any other mechanisms that we  
8 have in the Department to make necessary correction from  
9 a safety analysis standpoint, I think we have to make  
10 that judgment very carefully.

11 BOARD MEMBER ROBERSON: And I guess, and maybe  
12 there is no answer, I'm struggling with, you know, an  
13 example of when that judgment would be made.

14 MR. CHUNG: So the other thing that -- I  
15 mentioned about the likelihoodness of some of these  
16 events. Certainly that what we have experienced at WIPP  
17 wasn't something that we anticipated, right? So if you  
18 were to have nitrate salt with organics and commingled,  
19 you know, incompatible, you know, reactive chemicals,  
20 you need to use higher release fraction.

21 BOARD MEMBER ROBERSON: Okay.

22 MR. CHUNG: We do believe, however, that because  
23 of the OE that was issued, that this complex responded  
24 appropriately in terms of, hey, we have looked at our  
25 waste streams, we looked at our treatment, and the

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1 processing processes, as known at the time, that we do  
2 not warrant to use that higher release fraction. That  
3 was a decision based on their evaluation.

4 Now, when we -- when we go through the revision  
5 process for 5506, we will look at whether or not we need  
6 to adjust not only the release fractions, but do we need  
7 to make that -- it's going to be another judgment call  
8 in terms of, hey, do we think that should be analyzed as  
9 a likely event versus unlikely, or should we look at it  
10 as anticipated versus likely? Because that will also  
11 reinforce in terms of the potential need to develop any  
12 additional controls at a safety significant level  
13 through that safety analysis process.

14 So those are the kind of things that I think  
15 we're going to go through in order to continue to bound,  
16 at the same time -- at the same time that we can make a  
17 certain progress because we still believe that WIPP is  
18 the safest place where we can finally dispose our waste.

19 So I think that's going to be a -- you know, a  
20 disciplined process where we look at all the options  
21 again in terms of not only the particular parameter  
22 within the five-factor source term formulation, but also  
23 in terms of the overall methodology and keeping in mind  
24 that we are dealing with certain level of uncertainties,  
25 no matter what.

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1 MR. ZIMMERMAN: If I could, I'd like to maybe  
2 share some insight to where we are in Idaho with regard  
3 to this question, because certainly sampling is  
4 possible, but sampling has its own set of hazards. Now,  
5 what we've got historically is most of the waste has  
6 reasonably good paperwork, acceptable knowledge, process  
7 knowledge, associated with it. And right now, you know,  
8 we're down to really the very tail end of the Idaho  
9 mission as far as TRU waste goes, as Mr. Roscetti's  
10 slides in the opening indicate.

11 And what we're dealing with now is really a lot  
12 of the cats and dogs and some of the other stuff that  
13 the previous contractors have set aside, either because  
14 it was difficult or primarily because in some cases  
15 there's a lack of that proper documentation from the  
16 generator site, which for our waste primarily came from  
17 Rocky Flats, but there were also other generators.

18 So right now the contractor, and this is partly  
19 in response to the ARP V event that occurred, they are  
20 doing computer modeling on basically interactions from  
21 all the chemicals that are in the waste streams that we  
22 have information about and coming up with a set of  
23 controls that we can apply to that situation.

24 But what we have, and this is exactly what -- to  
25 a sense what was in ARP V, is there's probably about 150

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1 cubic meters remaining that we don't have adequate  
2 acceptable knowledge and documentation associated with.  
3 And so we are evaluating whether for the unknowns that  
4 sampling may be the appropriate piece, but the computer  
5 modeling has shown that the controls that we've  
6 developed after ARP V are adequate for all the chemicals  
7 that we know that are in the existing waste streams.

8 The other very important control that's in place  
9 is the waste streams are essentially segregated, and  
10 we've -- you know, we've directed the contractor, and  
11 their analysis accounts for this, as well as their  
12 procedures, but we don't commingle waste streams.

13 So, in general, you know, it's when there is  
14 mixing, it's usually waste stream to waste stream. In  
15 the ARP V event, as it turns out, commingling, you know,  
16 probably was not a potential issue, but it -- it will  
17 come out later that -- and through the investigation,  
18 that it was essentially a collection of unknown waste  
19 streams. So there was the potential for commingling  
20 inadvertently, which wasn't really apparent at the time.

21 However, you know, in this case, you know, that  
22 ARP V drum was -- and because of the lack of data, this  
23 was really some part of the characterization process  
24 that it was undergoing, as well as the initial treatment  
25 for removal of any prohibited items, in accordance with

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1 the WIPP WAC. And the chemicals that actually reacted  
2 and led to the overpressurization had co-existed within  
3 that drum pushing 60 years at this point. You know,  
4 that drum I think got on site in the early 1960s.

5 And so it was actually this activity of initial  
6 characterization and treatment that ended up basically  
7 exposing the uranium to air that subsequently led to the  
8 methane generation from the beryllium carbide.

9 BOARD MEMBER ROBERSON: Thank you.

10 MR. ZIMMERMAN: I guess if I could, I guess I  
11 would conclude, just to make sure it's clear, I believe  
12 that the sampling is currently under evaluation, but it  
13 is for those waste streams and individual drums that  
14 there's not sufficient characterization already  
15 existing. Because the majority of the paperwork that  
16 could be -- that can trace a drum back to the generator  
17 has been fairly accurate.

18 BOARD MEMBER ROBERSON: Thank you.

19 CHAIRMAN HAMILTON: Board Member Connery?

20 BOARD MEMBER CONNERY: I have a line of  
21 questioning on Idaho from Mr. Zimmerman, but before I do  
22 that, I have two quick questions for Mr. Chung with  
23 hopefully quick answers. One, based on what you said,  
24 my understanding is the Department considers that  
25 release fraction of 0.205 only in the circumstances of

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1 improperly remediated nitrate salt. Is that correct?

2 MR. CHUNG: And the only other very energetic  
3 chemical runaway reaction that could be formed with  
4 other types of chemicals and organics --

5 BOARD MEMBER CONNERY: So it shouldn't only be  
6 at sites which had potential nitrate salts, it should be  
7 at any site that could have that kind of energetic  
8 reaction? That's different from what I understood you  
9 to say earlier.

10 MR. CHUNG: Yes.

11 BOARD MEMBER CONNERY: And my second question is  
12 the decision to determine whether or not to use that  
13 release fraction, that was done at the site level,  
14 because you put the OE out and it was up to the site to  
15 determine whether or not they were going to use that  
16 release fraction or a different release fraction?

17 MR. CHUNG: My understanding is the site  
18 responded and then headquarters had also reviewed the  
19 responses.

20 BOARD MEMBER CONNERY: In any cases did  
21 headquarters overturn the site's determination?

22 MR. CHUNG: I would not know that. Maybe Ted  
23 can shed some light.

24 MR. WYKA: No. No. Post-WIPP, you know, all  
25 DOE sites, including NNSA sites, evaluated their waste

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1 streams per the OE that was put out. We noticed -- that  
2 was in June, I think, of 2015.

3 BOARD MEMBER CONNERY: Yes.

4 MR. WYKA: And all the sites applied DOE --  
5 OE -- DOE evaluation criteria and they concluded that  
6 they did not have, you know, any such waste streams, or  
7 very limited quantities. The only one from our side was  
8 Los Alamos, in that they needed to continue to evaluate  
9 for energetic chemical reactions. So headquarters  
10 agreed with it and it's what the site field office had.

11 BOARD MEMBER CONNERY: I appreciate that, I just  
12 wanted to clarify, because I was getting lost in the  
13 long answer, so I just wanted a quick answer to that.

14 I want to turn to Mr. Zimmerman now, because we  
15 were talking about the WIPP event, and based on your  
16 last bit of testimony, obviously we're switching over to  
17 talk about the Idaho incident in 2018 and the  
18 overpressurization event and subsequent radiological  
19 release.

20 So I want to focus on that for a few minutes and  
21 I would like to enter Exhibit Number 9 into the record.  
22 (Exhibit Number 9 was entered into the record.)

23 BOARD MEMBER CONNERY: So this exhibit shows the  
24 progression and causes, in simplistic form, of the April  
25 2018 events as described by your contractor. We're

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1 still evaluating, but this is what the contractor  
2 postulates as the progression. So I just want to put  
3 that up there so everybody can see it. And because I  
4 like the pictorial description of it.

5 So I'm not trying to beat a dead horse here, but  
6 Idaho has had previous experience with uranium fires, as  
7 well as methane generating waste. Were the hazards  
8 considered -- these hazards considered in this facility  
9 safety bases, and if so, why didn't the facility have  
10 controls in place to prevent or mitigate the accident?

11 MR. ZIMMERMAN: I guess one perhaps comment on  
12 the record about the drawing, but the uranium and the  
13 beryllium carbide were in the same drum, they didn't  
14 come from separate drums and then placed in the trailer.

15 BOARD MEMBER CONNERY: I think that's your  
16 contractor's drawing, but we'll make a note of it. Same  
17 batch.

18 MR. ZIMMERMAN: But I mean, the bottom line is,  
19 the previous assumptions that we had in place wasn't the  
20 reaction -- any reaction that would occur quickly and  
21 violently. You know, for example, consistent with the  
22 pyrophoric reactions that had been observed previously  
23 and throughout the history at Idaho. And we had not  
24 seen this type of event, which was basically a slow  
25 reaction and heating that led to secondary reactions.

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1 In this case it was the beryllium carbide, and  
2 essentially moisture from the air reacting to generate  
3 methane once the temperature exceeded 200 Celsius in the  
4 drum that overwhelmed the vent that was in place so that  
5 ultimately the lid came off the drum and released some  
6 of the contents into the room inside the ARP facility.

7 Additionally, the control strategy that was in  
8 place at the time of the ARP event was not successful,  
9 again, because we were not aware of rapid hydrolysis of  
10 the beryllium carbide would generate large quantities of  
11 the methane gas. In fact, you know, we were not aware  
12 of the beryllium carbide content within the waste drum,  
13 because all of this drum was lacking a lot of  
14 characterization data.

15 What data was available at the time was that  
16 there was less than 1 percent beryllium in the drum.  
17 Sampling post-event identified 30 percent beryllium. So  
18 that really challenges -- obviously was challenging even  
19 the ability for the contractor or DOE to have identified  
20 the potential for this event.

21 Also, throughout the process, I mean, there was  
22 basically some nonconservative decisions and a lack of  
23 questioning attitude that was conducted. For example,  
24 the folks that are really responsible for the facility  
25 probably didn't look broadly enough at the 2017 event

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1 that occurred in the advanced mixed waste treatment  
2 facility because that was a pyrophoric reaction that  
3 occurred when they opened up a sealed container inside  
4 of the box line, and in this case, it was just -- it had  
5 become kind of an ingrained cultural issue that uranium  
6 and sludge was not reactive. And in this case, from the  
7 radiography, all indications were this was a homogenous  
8 solid sludge that contained some uranium.

9 Then in addition to that, you know, as  
10 identified in the investigation report, the workers that  
11 were conducting this, when they opened up the drum and  
12 saw the materials, did notice that it was somewhat  
13 different than they had seen in previous sludges. In  
14 this case it was -- you know, they saw a silvery type  
15 powder substance, which was most like the uranium in the  
16 drum, and it wasn't like -- it wasn't exactly like other  
17 sludges. And so at that point, you know, that issue,  
18 again, was failed to be raised at that point.

19 So there were multiple barriers that were in  
20 place or expected to be in place that were not  
21 effective. For this event.

22 BOARD MEMBER CONNERY: So in general, what  
23 you're saying is you were relying on the operators to  
24 recognize that this was a waste stream that was poorly  
25 characterized and notice any differences in the waste

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1 stream as they were processing it, rather than any other  
2 kind of physical controls within the facility for  
3 monitoring?

4 MR. ZIMMERMAN: No, that is not the primary  
5 control that we were relying on, it is one of the  
6 administrative controls that is relied on, and it is  
7 part of -- and it wasn't necessarily the operators.  
8 Maybe I misspoke. We were also doing, you know, visual  
9 observation with trained and qualified individuals who  
10 can identify visually the specific waste stream back to  
11 processes, primarily at Rocky Flats. And so we were  
12 relying on that aspect, also, to identify, you know,  
13 unexpected type conditions, and just have a questioning  
14 attitude.

15 But the location where, you know, this waste at  
16 the time was being processed does have engineered  
17 controls in place, but those are the barriers that I  
18 mentioned that failed that allowed the drum to then, you  
19 know, be filled and essentially put the lid on, which  
20 basically containerized the event. And again, that  
21 control set was really focused previously on the  
22 reactions that are going to occur quickly, and they  
23 occur in the place where the engineered controls exist.

24 BOARD MEMBER CONNERY: Thank you.  
25 CHAIRMAN HAMILTON: Ms. Roberson?

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1 BOARD MEMBER ROBERSON: So, Mr. Zimmerman,  
2 following onto Ms. Connery's question. So we understand  
3 that Idaho has implemented a thermal monitoring control  
4 after the event. Can you describe this control?

5 MR. ZIMMERMAN: Yes. Yep. Since the event, we  
6 have implemented additional TSR level controls through,  
7 you know, the evaluation, the safety of the situation,  
8 that was conducted, as well as a significant amount of  
9 analysis that the contractors conducted dealing with  
10 basically all the possible adverse chemical reactions  
11 that could occur.

12 So based on that modeling, it has concluded that  
13 for the known chemicals that we could put into the  
14 facilities, that those reactions would all occur within  
15 16 hours, based on the technical analysis, and result in  
16 temperature rises that within that time frame should be  
17 within 3.6 degrees or less.

18 So the control is basically we empty the drum  
19 into the tray, inside of the facility where the engineer  
20 controls exist, and we essentially use a mechanical  
21 raking action to disturb the material, mix it with  
22 oxygen, and try to force any reactions that are -- you  
23 know, could potentially occur, to occur in that location  
24 where it is protected. And then hold that material in  
25 the area with the protected measures in place for 24

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1 hours, and conduct the thermal monitoring throughout the  
2 process.

3 And again, as I said, if basically the  
4 temperature in the tray is below -- within 3.6 degrees  
5 of the ambient room temperature, then the modeling shows  
6 that no further adverse reactions could occur once it's  
7 placed inside of the drum that could cause basically an  
8 overpressurization event like we had seen with the ARP V  
9 event.

10 I do want to just make sure it's clear, it  
11 doesn't mean that there's no chemical reactions that are  
12 ongoing, just that the chemical reactions that may  
13 continue on and decline off would not have adverse  
14 consequences.

15 BOARD MEMBER ROBERSON: Thank you. I think that  
16 was going to be my next question. That's very  
17 important. So now my next question is, obviously DOE  
18 has a lot of information available to it both from Rocky  
19 Flats, and at one time DOE had its own standard for  
20 stabilizing uranium to create the oxide. Was that body  
21 of knowledge relied on for validating this control? Do  
22 you know?

23 MR. ZIMMERMAN: I mean, I don't know that that  
24 body of knowledge was used for this particular control.  
25 I know the technical basis for how this control was

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1 developed for our application and the waste that we  
2 have. But also, as I understand it, you know, this  
3 control is a form of actually -- like I said, reacting  
4 the waste, treating the waste to be less reactive.

5 BOARD MEMBER ROBERSON: So in the worst case, it  
6 would be less reactive. Is there any monitoring after  
7 the waste is packaged and set aside for whatever is  
8 next, disposal? Is there any temperature monitoring,  
9 any thermal monitoring or any other?

10 MR. ZIMMERMAN: There are some additional  
11 controls. So after it is basically packaged, I'm not --  
12 I shouldn't say it's packaged. So this occurs in a  
13 place where it's -- the personnel don't have access.  
14 Once it meets the first checkmark where it's less than  
15 the 3.6 degrees from ambient, it's been held for 24  
16 hours. It comes into a drum packaging station, and in  
17 that drum packaging station, there are additional  
18 thermal monitoring that's in place, which is immediately  
19 prior to placing the material inside the drum, and after  
20 that point, it would be placed in a drum. And there are  
21 some additional monitoring after it's placed in storage,  
22 just in a general area for potential flammable gases and  
23 things like that.

24 BOARD MEMBER ROBERSON: So after it's placed in  
25 storage, there's monitoring for flammable gases. Is

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1 there -- go ahead. I don't want to interrupt you.

2 MR. ZIMMERMAN: I was going to say, that's in  
3 the general area, yes.

4 BOARD MEMBER ROBERSON: So it's monitoring in  
5 the general area?

6 MR. ZIMMERMAN: Right. The contractor is  
7 considering whether there's any value to conducting  
8 flamm gas sampling on every drum after it's treated.  
9 However, when we evaluate it, I mean, we've got to look  
10 at what is the value of that kind of sampling and what  
11 will we do with that data. And right now, the analysis  
12 looks like the control set would be exactly the same as  
13 what we have, except if we did the flamm gas data and it  
14 tested high, we would put the drum into basically a  
15 single plainer array, mark it with a nonconformance  
16 report. It's just an added layer of control to make  
17 sure that it doesn't get shipped to WIPP in any  
18 inadvertent manner. And then ultimately flamm gas  
19 sampling is required prior to shipping to WIPP.

20 BOARD MEMBER ROBERSON: How long does the stuff  
21 stay in storage once it's packaged?

22 MR. ZIMMERMAN: Well, for us, we're projecting  
23 at the current shipping rates that we have to WIPP, it  
24 will take us until about 2028 to complete shipping all  
25 of the TRU waste from Idaho to WIPP. So this stuff

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1 could be in storage for a decade.  
 2 BOARD MEMBER ROBERSON: Thank you.  
 3 CHAIRMAN HAMILTON: So far we've talked about  
 4 chemical compatibility evaluation in waste drums. One  
 5 specific adverse chemical reaction is it generates  
 6 flammable gases, which we were just discussing, which  
 7 can cause overpressurization of -- or deflagration  
 8 events. We issued a Board letter on March 12th entitled  
 9 Idaho Waste Drums With Elevated Methane Concentration.  
 10 I'm going to ask Mr. Roscetti to highlight the  
 11 concerns that we had with the flammable gas generation  
 12 and mitigation.  
 13 (Exhibit Number 10 was entered into the record.)  
 14 MR. ROSCETTI: Yes, sir, I would like to enter  
 15 Exhibit 10 into the record. Solid radiological waste  
 16 can generate flammable gases and vapors through  
 17 radiolysis, chemical reactions, microbial activity, and  
 18 evaporation. If there is a flammable mixture of gases  
 19 and an ignition source, the gases could burn in what  
 20 could be a deflagration event. If a deflagration occurs  
 21 in a drum, the pressure in the drum would quickly  
 22 increase and the drum could rupture and release  
 23 radiological materials.  
 24 The contractor formal cause analysis does not  
 25 indicate that a deflagration occurred in the April 2018

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1 event at Idaho. The Board staff is still evaluating  
 2 elements of this analysis. The Department often puts  
 3 solid wastes into drums with vents; that is, each drum  
 4 has a vent. The purpose of the vent on the drum is to  
 5 allow any gases to escape from the drum.  
 6 The safety bases for the facility where the  
 7 Idaho event occurred states that a vented drum should  
 8 not reach flammable conditions; however, the Board's  
 9 staff has learned that the Department's contractors at  
 10 Idaho have detected potentially flammable conditions in  
 11 several drums. This observation demonstrates that  
 12 simply having a vent will not necessarily prevent a drum  
 13 from reaching a flammable condition.  
 14 If gases generated more quickly than it can  
 15 leave through the vent, gas will accumulate in the drum  
 16 and the drum could reach flammable conditions and/or  
 17 overpressurize. If a drum is known to reach flammable  
 18 conditions, extra cautions could be enacted to help  
 19 prevent ignition.  
 20 While the Department does measure the  
 21 concentrations of flammable gases in drums from shipping  
 22 those drums to WIPP, the Department does this to ensure  
 23 safe transportation to WIPP as well as the safety of  
 24 WIPP. There is no requirement for taking this  
 25 flammability measurement to assess the safety of the

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1 drums while those drums are at Idaho. As a result, the  
 2 Department has not taken such a flammability measurement  
 3 for thousands of drums that are currently at Idaho.  
 4 Thus, the Department does not know whether any of these  
 5 drums are currently flammable or nearly flammable.  
 6 After packaging legacy waste into new drums in  
 7 Idaho, the Department often stores the drums in  
 8 buildings that lack confinement ventilation systems. If  
 9 a drum rupture were to occur in those buildings, the  
 10 exhaust from those buildings is not currently filtered  
 11 to prevent the release of radiological materials to the  
 12 outside. Having a confinement ventilation system would  
 13 mitigate the impacts to people outside the building.  
 14 CHAIRMAN HAMILTON: Thank you, Mr. Roscetti.  
 15 Ms. Connery has some followup questions on this  
 16 topic.  
 17 BOARD MEMBER CONNERY: And I think some of these  
 18 you have addressed already, but I'm going to try to go  
 19 through them quickly, but they're in the order that I  
 20 wished to ask them to lead to something. In your May  
 21 7th response to the Department, from the Department to  
 22 the Board, when we sent you a list of questions, you  
 23 noted that over 10,000 drums at the site have not yet  
 24 been tested for flammable conditions. And you said that  
 25 untested drums would be sampled prior to shipment to

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1 WIPP because that's a requirement for WIPP, but as you  
 2 noted, they could be sitting there until 2028.  
 3 And so my question was going to be, is it  
 4 feasible for these drums to be tested at an earlier  
 5 date, and it sounds like you're investigating whether --  
 6 what the benefit of that would be. At this point the  
 7 jury is still out.  
 8 MR. ZIMMERMAN: That's correct.  
 9 BOARD MEMBER CONNERY: Okay. Are there any  
 10 additional controls that you apply once you know that a  
 11 drum is flammable? You said that you isolated those  
 12 drums and put a note on them so that they're not  
 13 inadvertently moved, but that does not necessarily  
 14 prevent anything from igniting them.  
 15 MR. ZIMMERMAN: Well, you know, the safety bases  
 16 does not identify TSR level controls, and it would be  
 17 required for those drums. The controls that we do have  
 18 in place are Defense-in-Depth, as well as those that are  
 19 based on basically industry standards or regulatory  
 20 requirements.  
 21 So there are a suite of controls in place,  
 22 predominantly the controls are driven by RCRA and OSHA.  
 23 So all the drums are handled and stored in accordance  
 24 with 1910-120, Part J, and that's consistent, you know,  
 25 with all the industry standards in how that type of



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1 drums would be handled or all drums.

2 So, you know, some of those controls, you know,  
3 we use a trained and qualified work force. We have HEPA  
4 filtered air vents. We also have, you know, waste  
5 container, you know, integrity inspection programs as  
6 well as spilled containment programs have been  
7 established.

8 And we are evaluating, you know, other potential  
9 controls that might be appropriate to put in place. And  
10 we have had an independent review from Jensen and Hughes  
11 to take a look at the controls. You know, they agreed  
12 with the controls that we have in place as being  
13 adequate.

14 They did make some recommendations for  
15 additional controls, which we are evaluating, but some  
16 of the controls they recommended, for example, you know,  
17 a blast shield, you know, for the forklift operator on  
18 the cab of the forklift, or that the spotters maintain a  
19 distance greater than 10 feet away. You know, I met  
20 with a group of waste handlers when we got that report,  
21 and talked to them about it, as well as the contractor.

22 In general, the workers have some concerns with  
23 those additional controls being added because they  
24 actually make their job performance less safe. The  
25 blast shield would make the visibility, you know,

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1 less -- less visibility, and it's basically a job where  
2 the placement of the drum has to be within inches. And  
3 they are aware of the hazards, and they are comfortable  
4 with the existing controls that are in place.

5 So it's one of those, we've got to be careful,  
6 it's easy to add controls to address one hazard, but we  
7 have to make sure that we balance out the total impact  
8 so we ensure the workers do their job in a safe manner.

9 BOARD MEMBER CONNERY: So obviously human  
10 factors play into it. You said there are HEPA filters  
11 in place in every place that you store drums at Idaho?

12 MR. ZIMMERMAN: No, I was talking about there  
13 are vents on the drum that are HEPA filtered. Right,  
14 not all the facilities.

15 BOARD MEMBER CONNERY: Oh, okay. So the  
16 facilities may or may not have them?

17 MR. ZIMMERMAN: For the most part they do not  
18 have HEPA filtered exhaust in the storage areas.

19 BOARD MEMBER CONNERY: So, Mr. Griffin, in the  
20 response to us, again on May 7th, you said that the  
21 Department is directing EM to -- asking the generator  
22 sites to complete an extent of condition in fiscal '19  
23 to determine the population of product drums at those  
24 facilities that have not had their flamm gas  
25 concentrations measured. Is this part of the

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1 information that you expect to get in September? Is  
2 that when we should expect to see that information?

3 MR. GRIFFIN: No. I think it's all part of the  
4 overall safety alert you're talking about there.

5 BOARD MEMBER CONNERY: Yeah.

6 MR. GRIFFIN: It's going to be part of that.  
7 And that was issued the end of May.

8 BOARD MEMBER CONNERY: You discussed any plans  
9 the NNSA generator sites have that have not had --

10 MR. WYKA: Yes, ma'am. As previously mentioned,  
11 we sent out a similar type alert to all the NNSA sites,  
12 pretty much the same type of actions for them to look  
13 at.

14 BOARD MEMBER CONNERY: An EM, you sent out an  
15 EM?

16 MR. WYKA: Yes, and I did that because I knew  
17 the Department alert was coming out, so I wanted to get  
18 that out rather than waiting for the alert. And the  
19 plan is to meet with all the generator sites at the TRU  
20 Waste Program Review in October 2019 and review the  
21 information.

22 BOARD MEMBER CONNERY: Thank you.

23 CHAIRMAN HAMILTON: Thank you, Ms. Connery.

24 Mr. Zimmerman, and Mr. Wyka, I think you've  
25 addressed this in pieces and parts already, but I wanted

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1 to ask it very clearly. If you look back at the April  
2 2018 event, what are the lessons learned that have been  
3 or should be communicated to the other generator sites,  
4 including lessons learned from the initial response to  
5 the event?

6 MR. ZIMMERMAN: I think that if a few of the  
7 things, especially on the initial response, you know, in  
8 the case in Idaho, there had been a significant number  
9 of false alarms with the fire department, and although  
10 they are required to basically respond and turn out gear  
11 and the respirators, they didn't make their first  
12 initial entry in respirators. They opened the door,  
13 found smoke, they weren't expecting the condition they  
14 had been sort of conditioned to expect there,  
15 unfortunately.

16 So we've basically, on the site, we are  
17 improving that communication between the project and the  
18 fire department. We're making sure that the -- that  
19 they are aware of the potential hazards in every  
20 facility, and we are also looking at whether or not we  
21 have the ability to provide, you know, some sort of  
22 remote identification of the potential hazard as they  
23 respond.

24 So I mean, those are really, you know, focused  
25 as far as the response type lessons learned or actions

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1 that we are taking. And as far as the event, I think I  
2 kind of touched on it. For us it's that basically any  
3 form of uranium should be assumed to be reactive until  
4 you've proven otherwise. I think that's probably the  
5 big takeaway for us, one that we've been conditioned,  
6 unfortunately, you know, for the last 15 years, been  
7 conditioned in another way, that basically it's the  
8 roaster oxides that are potentially pyrophoric reactive  
9 material.

10 CHAIRMAN HAMILTON: I'm sorry to interrupt you,  
11 but my question is how have you taken those lessons to  
12 other sites?

13 MR. ZIMMERMAN: You know, for us, we issued the  
14 ORPS report, as we're required to do. So we issued the  
15 ORPS report, and that was the primary mode that we have  
16 done it. We have also provided presentations and  
17 briefings in various, you know, public settings, such as  
18 Waste Management Symposium, that provided an overview of  
19 the event, as well as the lessons learned and some of  
20 the actions that we were taking. As well as providing  
21 input to headquarters with regard to the development of  
22 the operating experience announcement.

23 We also -- you know, I personally shared this  
24 information through the biweekly call that the field  
25 managers have and alerted folks, and I think that -- and

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1 my safety staff did the same thing through their typical  
2 communications.

3 CHAIRMAN HAMILTON: Okay. Okay. Thank you.  
4 Mr. Wyka, did you want to add anything to that?

5 MR. WYKA: Yes, sir, just a couple of things.  
6 First, we provided the alert, we sort of summarized the  
7 event to all of our NNSA sites, as well as the  
8 contractor's report on the dynamics and specifics of the  
9 event. And we linked that a little bit, we linked that  
10 with the WIPP event as well, especially, and we focused  
11 on the two root causes, I'd call them contributing  
12 causes within the alert, which is, you know, management  
13 failed to understand, characterize and establish and  
14 implement adequate processes, controls for treating  
15 waste that lacked documented origin and process  
16 information, as well as management failed to continue to  
17 develop the safety culture over a number of years. You  
18 know, those are two significant contributing causes  
19 which are probably would be similar to most events that  
20 we have. So I really want them to pause, think, and be  
21 focused on these contributing causes.

22 CHAIRMAN HAMILTON: Okay. Thank you.  
23 Ms. Roberson?

24 BOARD MEMBER ROBERSON: Thank you, Mr. Chairman.  
25 I think this question is to you, Mr. Chung. A

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1 few minutes ago, somebody on the panel raised the panel  
2 of Defense-in-Depth. So if you would, please, discuss  
3 the concept of Defense-in-Depth, and how it's been  
4 implemented in environmental management and generator  
5 sites.

6 MR. CHUNG: Defense-in-Depth philosophy and its  
7 application and how it's implemented throughout the  
8 complex have been fairly well articulated in various DOE  
9 directives and standards and whatnot. In particular, we  
10 need to not rely on a single control for adequate  
11 protection. We have to have multiple layers, and we  
12 have been trying to institutionalize the hierarchy of  
13 control selection, prevention first, and then  
14 mitigation.

15 In terms of the safety classification of  
16 controls, we, of course, have safety class level  
17 controls for public protection. For collocated and  
18 significant worker safety, we have service safety  
19 control. We also have administrative controls that  
20 provide some aspect of Defense-in-Depth. Although it  
21 was not called out as safety bases driven controls that  
22 Mr. Zimmerman talked about, post ARP V event, those two  
23 operational restrictions that are written much like  
24 specific admin controls that are now referenced in  
25 technical safety requirements are, in fact, a form of

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1 Defense-in-Depth measures that we have decided to add.  
2 So it's basically, you know, have multiple areas  
3 of controls so that we have a reliable set that provides  
4 adequate protection.

5 BOARD MEMBER ROBERSON: Thank you.  
6 Mr. Roscetti, can you summarize the DNFSB  
7 staff's understanding of how the concept of  
8 Defense-in-Depth is being implemented at DOE waste  
9 generator sites?

10 (Exhibit Number 11 was entered into the record.)

11 MR. ROSCETTI: Yes, ma'am. I would like to  
12 enter Exhibit 11 into the record. DOE Standard 3009  
13 defines Defense-in-Depth as a fundamental approach to  
14 hazard control for nuclear facilities that is based on  
15 several layers of protection to prevent the release of  
16 radioactive or other hazardous material to the  
17 environment.

18 Having multiple layers of protection is  
19 especially important with the hazards we are discussing  
20 today. The WIPP and Idaho events show that the  
21 Department's efforts and controls to prevent such events  
22 may not always be successful.

23 I will use the second slide of Exhibit 11 as an  
24 example to demonstrate how the Department uses  
25 Defense-in-Depth to protect the public. The picture on

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1 the left shows drums of waste inside a facility and the  
2 picture on the right shows waste that has been packaged  
3 and stored outside a facility.

4 On the left, the waste inside of a facility  
5 normally has several layers of controls for release  
6 events. These layers of controls can include a  
7 confinement ventilation system that filters air before  
8 it leaves the building, as well as equipment to monitor  
9 the air for release.

10 The example also includes fire protection  
11 controls, such as fire detection and suppression  
12 controls. These controls illustrate the concept of  
13 Defense-in-Depth because there are several layers of  
14 protection to prevent or mitigate the release of  
15 radioactive material.

16 Contrast this with the picture on the right.  
17 The only control to prevent or mitigate a release of  
18 radioactive material for the waste stored outside of the  
19 facility is the waste container itself, including the  
20 passive vent. Several sites store waste, drums and  
21 containers outside. Therefore, they rely on the drum  
22 and passive vent as the only engineered controls to  
23 prevent or mitigate a release due to reactions inside  
24 the drum.

25 Given the uncertainty in the waste contents that

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1 we have already established in this session, the Board  
2 staff believes that this represents an opportunity for  
3 additional layers of controls.

4 (Exhibit Number 12 was entered into the record.)  
5 MR. ROSCETTI: I would like to enter Exhibit 12  
6 into the record. This exhibit uses several facilities  
7 at Los Alamos National Laboratory as examples to show  
8 how controls are implemented inconsistently with respect  
9 to potential chemical reaction events within waste.

10 As I said before, confinement ventilation  
11 systems limit the amount of radiological contamination  
12 released from a facility, but several storage locations  
13 do not have this control. Exhibit 12 also shows that  
14 many of the facilities do not have continuous air  
15 monitoring and only have relatively infrequent  
16 monitoring for contamination on surfaces.

17 Therefore, in the case of a potential chemical  
18 reaction event, there would be no realtime notification  
19 of the event to enable a response unless a worker  
20 happened to be in the area to see the event. The  
21 Board's staff again believes that this represents an  
22 opportunity for additional layers of controls.

23 The Idaho event illustrates the importance of  
24 having Defense-in-Depth. After drums are packaged, the  
25 contractor at Idaho often moves them to locations that

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1 do not have confinement ventilation. However, the case  
2 in the April 2018 event, the drums happened to still be  
3 in a location with confinement ventilation. This system  
4 helped avoid any releases outside the building.

5 BOARD MEMBER ROBERSON: Thank you. We should  
6 just leave this exhibit up.

7 CHAIRMAN HAMILTON: Thank you, Ms. Roberson.  
8 Ms. Connery?

9 BOARD MEMBER CONNERY: So I know this looks like  
10 a setup, it wasn't intended to be a setup, we're  
11 actually trying to make a point here. So my question is  
12 for Mr. Griffin. Obviously Mr. Roscetti just  
13 highlighted the lack of Defense-in-Depth for waste drums  
14 in certain situations, especially when stored outside.  
15 Given the experience at WIPP and Idaho, it's prudent to  
16 assume that drum ruptures can and do occur, and those  
17 are just two of the most recent examples. There have  
18 been many over the years.

19 Can you just let us know what your expectations  
20 are for having multiple layers of controls at EM  
21 facilities and how you've communicated this expectation  
22 or whether or not you are going to take some of this  
23 information into consideration as you're getting the  
24 information back from the safety alert going forward.

25 MR. GRIFFIN: Well, of course, I'm going to

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1 contrast the last point. We're obviously going to take  
2 that kind of information into consideration going  
3 forward. I mean, we clearly want to do that. You know,  
4 we're trying to be a learning organization that, you  
5 know, understands -- strives to understand where we can  
6 improve and makes those improvements.

7 Regarding the earlier exhibit, I guess, the  
8 pictures there and all that, I understand the point of  
9 the pictures is to perhaps a little bit out of --  
10 there's not any real context there. I mean, it's  
11 outdoors and indoors and it pointed out the potential  
12 lack of information, but again, I don't know the  
13 particulars there and what information did we have or do  
14 we really know about the outdoors drums versus the  
15 indoor drums.

16 I'm not trying to get legalistic on it, but it's  
17 a little bit hard to comment on something that's just a  
18 picture. You know, clearly there's a point to be made  
19 there, and I understand, you know, that the potential  
20 point is there, but I think we also have to consider  
21 that we're not dealing with quite that sort of -- we're  
22 not dealing with pictures, we're dealing with real drums  
23 with real -- where we either have an understanding or we  
24 don't and we try to work with those particular  
25 circumstances.

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1 So, but going forward, yes, we clearly -- you  
 2 know, that's the point of the safety alert and the  
 3 information we'll be gathering from that is to look at  
 4 these situations. And then as you note, if you've read  
 5 through the safety alert, you'll note at the very end  
 6 that we are going to fold this into or we're asking  
 7 sites to use 5506 to address it in their safety analysis  
 8 and we will be folding that into any improvements we  
 9 make in that as well over the next year.  
 10 BOARD MEMBER CONNERY: And I take your point  
 11 about the picture, that was supposed to be  
 12 representative, it's not a decisive picture of two  
 13 specific sites.  
 14 MR. GRIFFIN: I understand.  
 15 BOARD MEMBER CONNERY: The drums are not  
 16 necessarily -- don't necessarily have the same content,  
 17 they don't necessarily -- they're not necessarily the  
 18 same site, so it was representative versus definitive.  
 19 MR. GRIFFIN: And thank you.  
 20 BOARD MEMBER CONNERY: So, Mr. Wyka, again, same  
 21 question to you with regards to NNSA. I'm assuming  
 22 you're going to have a similar answer, but I want to  
 23 make sure we address this to both.  
 24 MR. WYKA: It would be a similar answer. It is  
 25 something we need to continue to learn especially with

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1 this alert and the waste management area --  
 2 CHAIRMAN HAMILTON: Is your mic' on?  
 3 MR. WYKA: Sorry. Thank you. As a learning  
 4 organization, this is something we're going to have to  
 5 learn as well and probably learn collaboratively with  
 6 our partners, and I think this slide is accurate. One  
 7 of my biggest concerns is, you know, the storage of the  
 8 drums at the hang pad. You know, I know there's a  
 9 concerted effort to get them from the outside and get  
 10 them into the transuranic waste facility. You know,  
 11 which is a safety significant 2 facility built very  
 12 robustly, in a much safer place than outside.  
 13 CHAIRMAN HAMILTON: Thank you, Ms. Connery.  
 14 Board Member Roberson?  
 15 BOARD MEMBER ROBERSON: Thank you, Mr. Chairman.  
 16 So, Mr. Wyka, we've spent a lot of time talking  
 17 about legacy waste here, and even though EM will be  
 18 generating waste, in the foreseeable future, too, let's  
 19 focus a little bit on what NNSA is doing to make sure  
 20 that in two decades, we wouldn't be having this  
 21 conversation about waste you're generating now.  
 22 So, what is NNSA's strategy for ensuring safety  
 23 throughout the life cycle of newly generated waste?  
 24 MR. WYKA: I think a lot of what we talked about  
 25 today, you know, to make sure the processes and

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1 procedures are in place, using the enhanced AK to make  
 2 sure that the waste through the interface waste document  
 3 list be okay, basis of knowledge, the chemical  
 4 compatibility to up front and packaging waste to make  
 5 sure we have a, you know, complete set of documents for  
 6 the waste being generated.  
 7 It's also processes and procedures. One lessons  
 8 learned from the WIPP event is as we change things, you  
 9 have to make sure that those changes, no matter how  
 10 small they are, are evaluated, because collectively, you  
 11 know, changes can make a significant impact, you know,  
 12 in a -- in the waste and stuff. So it's doing that.  
 13 It's also making sure that we have the right  
 14 qualifications. That's included in our Technical  
 15 Qualification Program on our Federal side, and that is a  
 16 key piece of our oversight strategy as well.  
 17 Getting back to my initial point that, you know,  
 18 the success that we have in waste management directly  
 19 impacts, you know, our mission at hand. Not only the  
 20 current mission, but our future mission.  
 21 BOARD MEMBER ROBERSON: And I appreciate that.  
 22 I mean, we look at everything you guys produce, and one  
 23 of the things we noted in the -- I don't want to use the  
 24 acronym -- Generator Site Technical Reviews, that I  
 25 would say is a vulnerability, is insufficient

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1 specificity in procurement controls for chemical  
 2 absorbance that may come in contact with the waste, and  
 3 they noted this as a concern for Livermore, Los Alamos,  
 4 Savannah River, Oak Ridge, and Idaho. And to me, I  
 5 don't know what NNSA has done with that. But maybe you  
 6 can tell me.  
 7 MR. WYKA: That's a good point. I can't  
 8 actually expand on that, but I know that -- and that's  
 9 something I'll obviously take back with me, because as I  
 10 mentioned previously, I do value those GSTRs, because  
 11 they look at you broad programmatically and some of the  
 12 same principles apply, you know, across the board, not  
 13 just waste management.  
 14 BOARD MEMBER ROBERSON: So maybe you can take  
 15 that for the record.  
 16 MR. WYKA: Yes, ma'am.  
 17 BOARD MEMBER ROBERSON: Thank you, sir.  
 18 And I think my last question, Mr. Chung, is to  
 19 you. So the Department has previously employed  
 20 stabilization methods to treat certain wastes at Los  
 21 Alamos to make it less reactive by adding inert  
 22 materials. What's the Department's perspective on more  
 23 widespread use of such methods to make waste less  
 24 hazardous? And I'm not suggesting one-size-fits-all,  
 25 but is this a strategy in the toolbox that the

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1 Department still considers?

2 MR. CHUNG: Jack may have some clarification or  
3 some added feedback on this question, but I think that  
4 applies more to the newly generated waste in terms of  
5 making the waste as that gets generated less hazardous,  
6 less challenging, as opposed to dealing with the legacy  
7 waste.

8 BOARD MEMBER ROBERSON: So what is the waste  
9 from D&D called?

10 MR. CHUNG: Excuse me?

11 BOARD MEMBER ROBERSON: What would waste from  
12 D&D be called? Is that category -- is that in the  
13 category of newly generated? I'm asking, I really don't  
14 know.

15 MR. CHUNG: Well, the D&D activities are ongoing  
16 that we have a much better record in terms of what is in  
17 the building.

18 BOARD MEMBER ROBERSON: Right.

19 MR. CHUNG: Plus the fact that we go through  
20 very careful processes of deactivating the materials  
21 before we go through the demolition activities, which  
22 become the bulk of the waste. So in terms of treating  
23 any kind of reactive materials, like we used to for  
24 surplus plutonium coming out of Rocky Flats, and for Los  
25 Alamos, we did decide to thermally treat to remove

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1 certain prohibitive items or moistures or whatnot, so  
2 that they become much more stabilized for long-term  
3 storage, as well as future utilization.

4 I'm not sure that that level of treatment,  
5 pretreatment, would be required for the typical waste  
6 that would be generated from our typical D&D activities.  
7 If we run into those, like it's not a radioactive  
8 material. Like a mercury issue at Oak Ridge, we are --  
9 we are designing, and we plan to construct a mercury  
10 treatment plant so we can dispose of that particular  
11 hazardous material in a safe and environmentally  
12 compliant manner. But in general, I haven't really  
13 thought about coming out with any pretreatment, like  
14 stabilization, to make the waste management and disposal  
15 less hazardous.

16 BOARD MEMBER ROBERSON: No, and I understand,  
17 and as I said at the beginning, I'm not assuming there  
18 is some across the board, really what we're focusing on  
19 are the waste anomalies that come up, and the question  
20 was has the Department negated that as a tool in the  
21 toolbox when it comes to challenging waste?

22 MR. CHUNG: I don't think we negate it, but we  
23 take it by a case by case in terms of whether or not we  
24 need to go through that extra measure in terms of  
25 pretreating or thermalizing or stabilizing.

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1 BOARD MEMBER ROBERSON: Okay. Thank you.

2 CHAIRMAN HAMILTON: Thank you, Ms. Roberson.

3 Do any of our Board, my fellow Board members,  
4 have any remaining questions for the panel?

5 (No response.)

6 CHAIRMAN HAMILTON: Okay. Hearing none, I want  
7 to thank all of you for being here today, Mr. Zimmerman,  
8 Mr. Griffin, Mr. Chung, and Mr. Wyka. And also  
9 Mr. Shrader, who is still in the audience. Thank you  
10 all for taking the time to be here and I know you didn't  
11 just walk in, you had to do some prep work, so we  
12 appreciate that.

13 My acting general counsel says that we have  
14 nobody who has signed up to make a statement in session  
15 3. Did anybody think he or she signed up and didn't?

16 (No response.)

17 CHAIRMAN HAMILTON: Okay. In that case, we are  
18 going to dispense with session 3 and I am going to ask  
19 my Board members for closing remarks.

20 Ms. Roberson?

21 BOARD MEMBER ROBERSON: Thank you, Mr. Chairman.

22 First of all, I want to thank all of the  
23 participants in the panel. I certainly learned some  
24 information along the way and I hope it was beneficial  
25 for the Department, including NNSA. The Board takes

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1 this mission area and the Defense Nuclear Complex very  
2 serious, as I know you do, and our questions were  
3 intended to both highlight and elevate some of the  
4 challenges that lie not just today, but in the future as  
5 well, too. So I appreciate your participation, and  
6 thank you.

7 CHAIRMAN HAMILTON: Ms. Connery?

8 BOARD MEMBER CONNERY: I also would like to echo  
9 the thanks for all of you coming today and doing all the  
10 prep work. The thing that encouraged me the most is the  
11 repetition of the phrase "learning organization." I  
12 mean, you're going to have to be a learning organization  
13 as your mission continues, both in the EM side and on  
14 the NNSA side.

15 The reason that we were asking questions  
16 relating it back to WIPP is because we believe that DOE  
17 as an organization has to be less reactive, no pun  
18 intended, and more forward thinking with regards to  
19 hazards that could come up and not simply putting out  
20 lessons learned about the last accident. We need to be  
21 able to predict the next one prior to it happening and  
22 hopefully preventing it or mitigating it as it happens.

23 So that was the nature of the questioning and it  
24 wasn't meant to do anything but be thought provoking,  
25 not provoking in any other way. So we also do this for

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1 the public because we think it's important for the  
2 public to hear how it is that you are protecting the  
3 public health and safety, and because of the nature of  
4 the event at Idaho, I don't know that it got a lot of  
5 attention given to it in the public atmosphere and we've  
6 gotten a lot of questions about it.

7 So this is for us very important, but also I  
8 think very important for the public to understand what  
9 actually took place, what the investigation looked like,  
10 and then what actions that you're taking to address  
11 those issues in the future.

12 So thank you.

13 CHAIRMAN HAMILTON: Thank you, Ms. Connery.

14 And just one more thing for anyone who wants to  
15 submit a written comment for the record, we will hold  
16 the record of hearing open in order to get those for 30  
17 days. So if you weren't able to be here, but you would  
18 like to submit a written comment, please do so within  
19 the next 30 days.

20 Our goal for this hearing was to discuss DOE  
21 actions to strengthen the safety posture of the nuclear  
22 waste operations of solid nuclear waste operations and  
23 gather information on the safety controls to address  
24 vulnerabilities associated with handling and processing  
25 solid nuclear waste at Defense Nuclear Facilities.

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1 To that end, we heard testimony from several  
2 department officials representing both Environmental  
3 Management and the National Nuclear Security  
4 Administration, as well as -- and we may hear and get  
5 some comments from the public should they submit them.  
6 The Board will consider the information gathered this  
7 afternoon to inform any actions that we may take  
8 regarding these issues.

9 Once again, I thank everyone for your  
10 participation at this hearing. The record of this  
11 proceeding will remain open until July 20, 2019. This  
12 concludes the public hearing of the Defense Nuclear  
13 Facilities Safety Board. We are adjourned.

14 (Whereupon, at 3:30 p.m., the meeting was  
15 adjourned.)  
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1 CERTIFICATE OF REPORTER  
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3 I, Sally Jo Quade, CERT, do hereby certify that  
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