

1 UNITED STATES OF AMERICA  
2 NUCLEAR REGULATORY COMMISSION  
3 OFFICE OF THE SECRETARY

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5 BRIEFING ON LESSONS LEARNED FROM THE NUCLEAR  
6 CRITICALITY ACCIDENT AT TOKAI-MURA AND  
7 THE IMPLICATIONS ON THE NRC'S PROGRAM

8 \*\*\*

9 PUBLIC MEETING

10  
11 Nuclear Regulatory Commission  
12 One White Flint North  
13 Commissioner's Conference Room  
14 11555 Rockville Pike  
15 Rockville, Maryland  
16 Monday, May 8, 2000

17 The Commission met in open session, pursuant to  
18 notice, at 10:02 a.m., the Honorable RICHARD A. MESERVE,  
19 Chairman of the Commission, presiding.

20 COMMISSIONERS PRESENT:

- 21 RICHARD A. MESERVE, Chairman of the Commission
- 22 GRETA J. DICUS, Member of the Commission
- 23 NILS J. DIAZ, Member of the Commission
- 24 EDWARD McGAFFIGAN, JR., Member of the Commission
- 25 JEFFREY S. MERRIFIELD, Member of the Commission

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

[10:02 a.m.]

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CHAIRMAN MESERVE: Good morning.

The Commission is meeting this morning to hear from the staff on lessons learned from the criticality accident at Tokai-Mura and the possible implications of that accident for the NRC's program. This briefing is supported by Commission paper SECY 00-0085, which was made available to the public on April 24th.

I think, as of all us would agree, that as the accident in Japan is revealed, an event anywhere in the world can have implications throughout the world, and I don't mean just the physical consequences just because of the fact that an accident anywhere causes us to need to reevaluate our own programs and activities, make sure that we're comfortable with where we are.

The staff has undertaken such an analysis and what lessons are to be learned from the accident for our own programs.

We will have the benefit on our second panel of an evaluation that was conducted under the auspices of the Nuclear Energy Institute, and then we will have a third panel that will consist of representatives from the Department of Energy who had participated in evaluation of the accident in Japan and also, of course, participated in ANN RILEY & ASSOCIATES, LTD.

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1 evaluation of the implications of the accident for DOE  
2 facilities.

3 We very much look forward to this morning's  
4 briefing, and let me see if my colleagues have any opening  
5 comments.

6 COMMISSIONER MERRIFIELD: I just want to say, you  
7 know, as we start on in this, at least from my point,  
8 ultimately, obviously, it's with some sympathy to the  
9 families of the two gentlemen who were deceased as a result  
10 of this accident.

11 Certainly, for my part, I want to put that in the  
12 record.

13 Obviously, this has also been a trying time for  
14 our sister agency -- sister agencies in Japan that have been  
15 attempting to struggle with this, and certainly, having been  
16 in difficulties of our own in years past and having received  
17 their support, would want to recognize the fact that we --  
18 we do recognize that they are going through a trying time  
19 and would have my sympathy in that regard.

20 CHAIRMAN MESERVE: Commissioner Merrifield has  
21 made a very fair point.

22 I have just returned from a visit to Japan, and it  
23 is -- I'll just report that there's obviously a very  
24 aggressive effort underway in Japan to understand the  
25 accident, understand its implications, which has very

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1 significant implications for the structuring of their own  
2 regulatory program.

3 As much as we have tried to learn from this  
4 accident, it's clear to me that the Japanese have made very  
5 aggressive efforts to do the same and are taking a variety  
6 of actions to respond to the situation.

7 Dr. Travers, you may proceed.

8 MR. TRAVERS: Thank you, and good morning.

9 As you indicated, Mr. Chairman, the staff is here  
10 to provide you with a summary of the events that surrounded  
11 the September 30, 1999, criticality accident that occurred  
12 at the JCO facility located in Tokai-Mura, Japan.

13 Additionally, as requested by the President and  
14 the National Security Council, the NRC has completed its  
15 review of the lessons learned from this accident, reviewed  
16 the criticality safety activities at the major U.S. fuel  
17 cycle facilities, and in fact, has verified that existing  
18 NRC oversight program, we believe, is adequate to ensure  
19 criticality safety at those facilities.

20 Giving the briefing today is Bill Troskoski. Bill  
21 is a Senior Fuel Facility Inspector in the Office of Nuclear  
22 Materials Safety and Safeguards and has been coordinating  
23 the NRC activities performed over the last seven months in  
24 response to the accident.

25 Bill is the author of the review and lessons

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1 learned Commission paper that was provided to the Commission  
2 in April.

3 Also here with me today are Janice Dunn Lee, who  
4 is the Director of the Office of International Programs;  
5 Bill Kane, who is the Director of NMSS; Frank Congel, who is  
6 the Director of the Incident Response Operations; and Mike  
7 Weber, who is the Director of the Division of Fuel Cycle  
8 Safety and Safeguards in NMSS, and I'm going to turn the  
9 briefing over to Bill Troskoski.

10 MR. TROSKOSKI: Thank you.  
11 May I have slide one, please?  
12 Good morning.

13 I am pleased to brief the Commission on the  
14 staff's review of the Tokai-Mura criticality accident, the  
15 lessons that we have learned as a result of that accident,  
16 and the implications for NRC's fuel cycle facility.

17 Slide two.

18 This briefing will cover the purpose of NRC's  
19 review of the accident, the basic background of the process  
20 involved, the root causes identified by the Japanese  
21 regulators, and the consequences, both on-site and off-  
22 site.

23 I would then like to highlight the staff's actions  
24 taken in response to the accident, followed by a general  
25 review of the deficiencies identified by the Japanese

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1 regulatory authorities, and review the implications for NRC-  
2 licensed facilities.

3       Following this, I will discuss several emergency  
4 response issues identified by the Japanese and compare these  
5 issues against the NRC program.

6       Finally, I would like to provide the staff's  
7 conclusions for your consideration.

8       I should state at the outset that the NRC staff  
9 recognizes that our fuel cycle oversight program can be  
10 improved.

11       Indeed, NRC has been revising Part 70 and last  
12 year initiated a process to review our program for fuel  
13 facilities, in concert with the stakeholders.

14       Nevertheless, we are pleased by the positive  
15 conclusions of our assessment.

16       The next slide, please.

17       The President requested the Department of Energy  
18 and the NRC to conduct a review of U.S. nuclear facilities  
19 to assure that a similar accident would be unlikely here.

20       Even without such a request, we had planned to  
21 review the lessons learned from the Tokai accident as part  
22 of our continuing efforts to enhance the effectiveness of  
23 our oversight program.

24       To accomplish this task, we reviewed the current  
25 safety operations at U.S.-licensed and -certified

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1 facilities, we considered the implications for NRC's  
2 oversight program, and drafted a report addressing the  
3 lessons learned and implications.

4 Slide four, please.

5 By way of background, the accident occurred on  
6 September 30, 1999, at the JCO Company site in Tokai-Mura.  
7 This is a densely-populated area located about 70 miles  
8 northeast of Tokyo.

9 The accident occurred in the conversion building,  
10 shown here at the end of the arrow. The site plan  
11 illustrates the general scale of the facility, and please  
12 note the zero to 200-meter scale bar shown on the bottom  
13 righthand side of the slide.

14 The nearest residential building is located about  
15 150 meters to the southwest of the conversion building. To  
16 the north of that residential building is a lumber yard  
17 where several workers were located during the first several  
18 hours of the accident.

19 About 160 members of the public were subsequently  
20 evacuated from within 350 meters of the plant, and 310,000  
21 people were subsequently sheltered within 10 kilometers of  
22 the facility.

23 Slide five.

24 The top portion of this slide is a diagram of the  
25 process and written operating procedures as approved by the  
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1 Japanese regulatory authorities.

2 The bottom portion shows the actual procedure that  
3 was used during the accident. The accident occurred in the  
4 precipitation tank, which is shown about in the middle of  
5 the process.

6 It is important to know that there was no hardware  
7 failure involved.

8 Official reports document that this was apparently  
9 not the first time that JCO employees had deviated from the  
10 written procedures without proper authorization in order to  
11 increase productivity.

12 Some other important factors directly related to  
13 the accident are that this was the first time the process  
14 was run in the last two to three years; of the three  
15 operators involved in the accident, two had no previous  
16 experience with the 18.8-percent enriched process, and the  
17 third operator had only about one or two months' previous  
18 experience.

19 The operators deviated from JCO's revised  
20 procedures, which were not reviewed by either their safety  
21 department or the regulator, due in part to production  
22 pressures.

23 Slide six, please.

24 Based on the Japanese investigations, the direct  
25 cause of the accident was due to the conduct of the

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1 operations.

2 Had the facility been operated in accordance with  
3 the approved procedures, this accident would not have  
4 happened.

5 Based upon the staff's review of the Nuclear  
6 Safety Commission's reports, the root causes were inadequate  
7 regulatory oversight, lack of an appropriate safety culture,  
8 and inadequate worker training.

9 Slide seven, please.

10 Sadly, as a result of the accident, two of the  
11 three workers died from radiation exposure. The third  
12 worker has been released from the hospital but is still  
13 under medical observation.

14 The doses presented on this slide are estimates,  
15 and refinements to the estimates are certainly possible as  
16 evaluations continue.

17 I would like to emphasize two points about this  
18 graph.

19 First, note that the doses to the three operators  
20 greatly exceeded the doses to the other people involved.

21 Second, note that there were more members of the  
22 public exposed than workers.

23 This is very unusual, because criticality  
24 accidents are not generally expected to cause off-site  
25 exposure. However, in this case, proximity of members of

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1 the public to the conversion building yielded a different  
2 result.

3 The next slide, please.

4 As the Commission is aware, we activated the NRC  
5 Emergency Operations Center during the accident. After we  
6 conducted a preliminary evaluation of the available  
7 information both during HP LaserJet Series IIHPLASEII.PRSs  
8 diffusion plants to focus the inspectors' attention on what  
9 we believed were the potential problem areas.

10 As a result of the additional inspections, no  
11 significant safety issues were identified at those  
12 facilities.

13 We also issued an information notice to the fuel  
14 cycle licensees to alert them to what we believed were the  
15 potential problems based on initial reports from the  
16 government of Japan, the International Atomic Energy Agency  
17 visit, and the Department of Energy visit.

18 Since the accident, the staff has continued to  
19 review and evaluate lessons learned to determine  
20 implications for commercial nuclear fuel cycle facilities  
21 and our regulatory program.

22 The sources of information included the various  
23 reports and briefings provided by the Japanese regulatory  
24 authorities, including the Nuclear Safety Commission and the  
25 Science and Technology Agency, other agencies such as the  
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1 IAEA, DOE, and the Japanese Atomic Energy Research  
2 Institute, as well as open news sources.

3 Next slide, please.

4 Based on the information developed from the above  
5 sources, the staff looked at each program component that was  
6 identified as deficient and performed a comparison between  
7 the factors that contributed to the accident at Tokai and  
8 U.S.-licensed facilities.

9 The safety evaluation performed by JCO and  
10 approved by the regulator assumed that the criticality was  
11 not possible.

12 Also, JCO was not required to install a  
13 criticality accident alarm system or develop an emergency  
14 plan or provide operator training regarding criticality  
15 safety.

16 U.S. licensees are required to perform evaluations  
17 that assume that a criticality is possible. They are  
18 required to install a criticality alarm system and develop  
19 an emergency plan.

20 Further, licenses also have individual operator  
21 training requirements.

22 The NRC's oversight program reviews the  
23 development and implementation of these program components.

24 Slide 10, please.

25 Operations at the JCO conversion facility were not

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1 inspected since 1992.

2 Operations at U.S. facilities receive periodic  
3 announced and unannounced inspections throughout the year.

4 Procedures are required at both the JCO facility  
5 and U.S. facilities.

6 The NRC oversight program addresses procedure  
7 development, review, and approval, including criticality  
8 safety reviews, as appropriate, and procedure  
9 implementation.

10 At the JCO facility, inadequate management control  
11 is exercised over the startup of the 18.8-percent enriched  
12 uranium process.

13 No steps were taken to ensure that the appropriate  
14 safety limits and controls were flowed down to the operators  
15 through procedures, postings, and training.

16 At U.S. facilities, the operating license defines  
17 the authorized activities and the management control systems  
18 to assure that the appropriate safety limits are developed  
19 and implemented.

20 The Japanese regulatory authorities also noted  
21 that there was not an appropriate safety culture at the JCO  
22 facility.

23 Management did not believe that a criticality was  
24 possible, and they did not exercise proper control over site  
25 activities.

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1 At U.S. facilities, the NRC inspection process  
2 provides feedback regarding a licensee's performance.

3 Inspection findings, event, and other reports are  
4 periodically evaluated and trended as part of our licensee  
5 performance reviews that are performed periodically for each  
6 facility.

7 As a result of the review that we performed, we  
8 identified no gaps in the NRC's regulatory oversight  
9 process.

10 Slide 11, please.

11 In addition to identifying the specific  
12 deficiencies that contributed to the accident, the Japanese  
13 Nuclear Safety Commission's report also addressed several  
14 performance issues related to emergency response that  
15 surfaced during the accident.

16 They noted that the initial emergency response was  
17 complicated by a lack of a criticality accident alarm  
18 system, the local population did not receive a timely  
19 notification to evacuate the immediate area, there were  
20 interface problems between various government organizations,  
21 and JCO's communications and emergency response system were  
22 not adequate to support what they felt needed to be done.

23 Slide 12, please.

24 The staff also considered whether each of these  
25 issues is address by NRC requirements.

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1           As a result of our review, we believe that our  
2 regulatory requirements and the NRC's licensing and  
3 inspection process provides an appropriate level of  
4 emergency preparedness for U.S. fuel cycle facilities.

5           Our facilities are required to have functional  
6 criticality accident alarm systems, and we do inspect that  
7 as part of our core inspection program.

8           Emergency plans are required for the larger  
9 facilities.

10          We do have a reg guide that defines what the  
11 content of the plans should be. The emergency plans are  
12 reviewed and approved by the licensing function, and they  
13 must address issues such as prompt notification of off-site  
14 response organizations and they must address the  
15 coordination of emergency actions.

16          From those approved emergency plans, licensees are  
17 required to develop site-specific implementing procedures.  
18 They are also required to conduct periodic drills with the  
19 local emergency response organizations and invite the state  
20 and local governments to participate if they so choose. At  
21 the end of the drills, they hold critiques to identify  
22 lessons learned.

23          The NRC core inspection program reviews emergency  
24 planning.

25          Slide 13.

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1           In conclusion, we believe that the Japanese  
2 government has conducted a thorough investigation of the  
3 criticality accident at Tokai-Mura.

4           We believe that the accident root causes are  
5 similar to causes of previously criticality accidents that  
6 have occurred throughout the world.

7           The current safety program carried out at  
8 commercial U.S. fuel facilities makes a similar accident  
9 unlikely, and finally, emergency response plans provide  
10 defense-in-depth at U.S. facilities.

11          That would conclude the staff's formal  
12 presentation at this time.

13          MR. TRAVERS: If I may just make one point of  
14 emphasis, Bill mentioned that the U.S. program, in contrast  
15 to the Japanese program, includes periodic inspections at  
16 fuel facilities.

17          In fact, at the facilities that have our license  
18 for high-enriched uranium, we have resident inspectors, and  
19 at the gaseous diffusion plants, as well.

20          So, we not only have a periodic inspection  
21 capability and program that covers all fuel cycle  
22 facilities, but in those instances where high-enriched  
23 uranium is licensed for use, we have a resident inspector  
24 program.

25          That concludes our presentation.

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1 CHAIRMAN MESERVE: Thank you very much for a  
2 helpful presentation.

3 Commissioner Diaz.

4 COMMISSIONER DIAZ: Good morning.

5 I believe that the staff should be congratulated  
6 on focusing its studies on what is really important from our  
7 perspective, which is the analysis of not the event in  
8 itself, which we had no control over, but the results of the  
9 events and how can we use it to ensure adequate protection  
10 of public health and safety in this country, and I have gone  
11 through it carefully, and I am satisfied that every effort  
12 has been made to compare situations and make sure that we  
13 have addressed those issues.

14 I think that it appears that we have done a very  
15 good job, and I'd like to thank the staff for it.

16 I have two questions.

17 The first one is on the actual review that was  
18 done for our facilities, and is there any additional action  
19 that the staff believes is needed to ensure adequate  
20 protection of public health and safety at U.S. facilities at  
21 this time?

22 MR. TROSKOSKI: No additional action is needed.

23 Again, we are revising Part 70, and we are also looking to  
24 revamp our program to make it more risk-informed and  
25 performance-based, and that will certainly enhance it, and

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1 we recognize that we can do a better job with our oversight  
2 program in that regard.

3 As far as there being any immediate safety issue  
4 that we needed to take action on or that we need to take  
5 action on in the immediate future, no.

6 We believe that there is an adequate margin of  
7 safety at each of the facilities today.

8 COMMISSIONER DIAZ: All right. Thank you.

9 The second area is always one of my pet peeves,  
10 and it deals with information to the public, and I realize  
11 that there are many things that were not under our control  
12 in here, of course, it was in the control of somebody else.

13 However, I still believe that, like the Chairman  
14 stated, we need to be able to respond to these situations  
15 when they happen, and I will make a comment and then I'll  
16 ask the question.

17 It is obvious -- and of course, Los Alamos has  
18 done a very good analysis, but we have known for a long  
19 period of time that accidents at fuel facilities or at  
20 research reactors have very limited capabilities to cause  
21 public health and safety damage, that the damage is normally  
22 -- or the risks are constrained to the area of the facility  
23 that -- like in this case shown and like Commissioner  
24 Merrifield already pointed out, there was an unfortunate,  
25 you know, death of two workers, one is already injured.

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1           There was some, you know, radiation levels  
2 registered for people close to the facility, already alluded  
3 to it.

4           However, I always get concerned that one of our  
5 missions is to bound these things in terms of what the  
6 public health and safety perceptions are, and I was  
7 wondering whether, not the first day when we have no  
8 information, not the second day, but if we, in our public  
9 information, public affairs efforts, did we try to establish  
10 that criticality accidents at fuel facilities are bounded by  
11 the limitations of the small amount of fuel, the small  
12 amount of fission products, all of those things that make  
13 criticality accidents things that we worried about but that  
14 have never caused a significant public health and safety  
15 issue. Did we address this issue? And I don't know who is  
16 going to answer that question.

17           MR. TROSKOSKI: The press release that we issued  
18 did not address that, sir.

19           It was something we were just focusing on the  
20 event at the time but we weren't trying to say, hey, our  
21 facilities are enveloped by the analysis, we don't expect  
22 there to be off-site consequences, if there are we've got an  
23 emergency plan there.

24           We were more just focused on a much more narrow  
25 focus on the event at hand because of the high news profile

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1 that it received.

2 COMMISSIONER DIAZ: As a lesson learned from this,  
3 should we be prepared, if there is -- you know, which there  
4 could be, because they are not impossible, they are --  
5 accidents do happen -- to address the level of risk  
6 associated with accidents?

7 I think this is a major issue that faces the NRC.  
8 We need to be able to bound the risk for the people that we  
9 serve, and we need to be able to address it, and I repeat,  
10 for criticality accidents at fuel facilities, the public  
11 health and safety impacts will always be small, and I will  
12 say will, not could. There are limits to what it could do.

13 MR. KANE: I think your point is well taken,  
14 Commissioner.

15 I know one of the things that we were dealing with  
16 early on was we wanted to also make sure we completely  
17 understood what had happened so that tempered, I think, some  
18 of our earlier discussions.

19 COMMISSIONER DIAZ: Thank you, Mr. Chairman.

20 CHAIRMAN MESERVE: Commissioner Merrifield.

21 COMMISSIONER MERRIFIELD: Thank you, Mr. Chairman.

22 Upon reviewing these materials, it would appear to  
23 me that, obviously, competitive pressures did play a role in  
24 some of the consequences, inadequate staff resources.  
25 Obviously, there may be some other cross-cutting factors,

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1 human factors and safety culture, leading to the accident.

2 Are the inspection programs and the regulatory  
3 programs that we have here at the NRC, combined with some of  
4 the industry self-assessments -- are they adequate to detect  
5 circumstances where there may be deteriorating trends on  
6 cross-cutting factors? Could you talk to that a little bit?

7 MR. TROSKOSKI: I believe they are.

8 We go out and we look in a number of areas,  
9 everything from operations to crit safety to chem safety to  
10 health physics, etcetera.

11 We periodically evaluate the problem reports at  
12 these facilities to look for trends.

13 We bring it all together as part of the licensee  
14 performance review process that we do, but aside from that,  
15 if we find any potential significant indicator, it's  
16 certainly run up the management pole, management chain, very  
17 quickly, so that we can take action, especially when you're  
18 talking about use of procedures, plant modifications, losing  
19 control over the conduct of operations in the facility.

20 That's something that we look at in detail, both  
21 the regions and headquarters, from a number of different  
22 perspectives and disciplines.

23 So, I think we've got -- we would be able to find  
24 that out in a timely manner.

25 MR. KANE: We are sensitive to those issues.

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1 Again, what we measure is safety performance, and we believe  
2 that, by doing it that way and having our periodic  
3 assessments with the regions of safety performance, that we  
4 are able to detect if that turns out to be the cause -- the  
5 root cause of change in safety performance, we would be able  
6 to pick that up through our inspection program, we believe.

7 COMMISSIONER MERRIFIELD: I want to take the  
8 opportunity to compliment the staff for their hard work on  
9 this issue.

10 As the Nation's leading regulator of nuclear power  
11 plants and fuel cycle facilities, we were obviously  
12 inundated from inquiries from the press about this incident,  
13 and obviously, as has been mentioned, we tried to respond to  
14 those inquiries in a measured and well-informed manner.

15 Are there any lessons that we have to learn for  
16 ourselves about this incident and how we can appropriately  
17 act in terms of providing public information about incidents  
18 that happen at facilities external to the United States?

19 MR. CONGEL: Yes, Commissioner. I'd like to  
20 briefly describe a program that we are in the process of  
21 developing right now and that will be brought up before the  
22 Commission shortly.

23 As a result of Tokai-Mura, as you just mentioned,  
24 there was a communication and information requirement placed  
25 on us that was different from some of the planning that we

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1 already had in place.

2 It was also enhanced with the experience that we  
3 had during the Y2K rollover; namely, to have the Federal  
4 Government coordinated in such a way that we were speaking  
5 in a consistent as well as a proceduralized way.

6 The effort that we are in preparation of is called  
7 the One Voice initiative, and it is a direct result of what  
8 happened at Tokai-Mura.

9 Very briefly, the existing Federal radiological  
10 emergency response plan calls for a designation of a lead  
11 Federal agency, and for foreign events of this sort, EPA is  
12 the lead.

13 Of course, EPA, like all of us, has its principle  
14 focus on protection of U.S. citizens, and Commissioner Diaz  
15 pointed out, this particular event, although very  
16 catastrophic for the workers and potentially affecting the  
17 local population, did not have any direct potential impact  
18 on the U.S.

19 So, EPA's role was low-key.

20 On the other hand, the request for information  
21 about facilities similar to those in the United States that  
22 would be overseen by us or run by Department of Energy was  
23 intense, and we mustered a response that was outside of the  
24 scope and planning of the FRERP, and what we are in the  
25 process of preparing that you will shortly see is a

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1 coordinated effort using the FRERP as a base and the Federal  
2 Radiological Protection Coordinating Committee, which is  
3 made up of 17 agencies that have responsibilities in this  
4 area, so that in anticipation of such an event, we will have  
5 a procedure in place that will address this.

6 It clearly requires a different coordination than  
7 one that would require protecting American citizens.

8 That's probably the principle lesson learned, I  
9 would say, from our response basis.

10 COMMISSIONER MERRIFIELD: I think part of our role  
11 as an agency in this regard is to make sure that we are  
12 providing accurate and timely information to the American  
13 public, so they are appropriately informed about these  
14 incidents and are able to put them in an educated context.

15 COMMISSIONER DIAZ: The things that, you know, I  
16 tried to address, and Commissioner Merrifield has focused on  
17 it again, is, for example, for two days, at least, maybe  
18 three days, you could see it in the TV, you know, CNN was  
19 calling this, you know, the new Chernobyl, you know, and you  
20 know, creating alarm, and I think we need to be ready to  
21 bound these things, to say, you know, this doesn't have the  
22 amount of fission products, it cannot -- you know, even if  
23 the entire mass gets airborne, it's just really not in that  
24 category, and I think our capability of, you know, quickly  
25 bounding the -- not exactly, because we don't know about it,

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1 but providing some bounding to the potential for public  
2 health and safety is a very good function that we must be  
3 able to carry out.

4 Thank you, sir.

5 COMMISSIONER MERRIFIELD: I think the American  
6 people deserve to have accurately and timely information  
7 about these accidents, and I agree with the Commissioner.

8 One last point I would want to make, and then I'll  
9 bow out for this panel -- I had an opportunity last week, as  
10 some other Commissioners may have, to meet with a delegation  
11 of individuals from the Japanese bar association.

12 They were here to learn more about the way in  
13 which the United States regulates nuclear materials, and  
14 they were making some recommendations to the Japanese diet  
15 about how the Japanese regulatory system may be enhanced,  
16 and I mentioned to them, as this Commission has, both  
17 publicly and privately, previously, that we believe that  
18 having the NRC as an independent regulator, without other  
19 external or internal government involvement, enhances our  
20 role and our ability to regulate nuclear power plants and  
21 nuclear fuel cycle facilities.

22 I think that is something that Japanese diet is  
23 strongly considering at this point in terms of some of the  
24 recommendations for modifying their system, and certainly,  
25 for my part, I'd want to put in the public record a repeat

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1 of our earlier statements that we believe independence in a  
2 regulator of the nuclear industry makes a lot of sense.

3 Thank you, Mr. Chairman.

4 CHAIRMAN MESERVE: Commissioner McGaffigan.

5 COMMISSIONER McGAFFIGAN: I have about three lines  
6 of questioning I want to pursue, and one of them has been  
7 provoked by the earlier comments.

8 I was Acting Chairman the day of this event, and  
9 we did, as Frank talked about, activate our center on a -- I  
10 don't know the right term -- contingency basis.

11 We knew it didn't affect people in this country,  
12 wouldn't affect people in this country, but there was a  
13 typical fog of war.

14 We did not have good information. We were getting  
15 it from CNN and from various other folks, and so, it was  
16 difficult to know when it was going to be over, how many  
17 local residents had been exposed at levels about the, you  
18 know, 100-milligram, 1-millisievert public dose limit, and  
19 all of that.

20 One of the people who did the best job in the  
21 first couple of days, I think I recall, bounding the  
22 accident was actually Tom Cochran of NRDC.

23 I think he was one of the talking voices on one of  
24 these shows, and he was quite complimentary towards the U.S.  
25 regulatory system and towards bounding the issue for the

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1 public.

2 I think we could do a better job, but it was very  
3 difficult during those opening hours to have a real sense as  
4 to what was going on.

5 The other thing I'll say about lessons learned --  
6 and this is probably a little -- in my role as Acting  
7 Chairman -- Frank talked about EPA being low-key.

8 I think the person who normally does this stuff at  
9 EPA was actually on leave that day, and it was very hard  
10 getting a rise out of anybody at EPA.

11 State was involved.

12 DOE was involved. DOE was so involved that the  
13 first thing we knew that DOE was doing something was when  
14 Secretary Richardson made announcements with Mr. Adamov from  
15 Moscow, and so, he sort of asserted DOE leadership.

16 The President made a statement, which we didn't  
17 know about until after the fact, we had to get it from OSTP.

18 So, there was a lot -- this One Voice initiative,  
19 I think, is quite important.

20 I think there -- we have to have a connection with  
21 the White House during any event, domestic or international,  
22 and we need to make sure that somebody, even if it's on an  
23 ad hoc decision, somebody is put in charge of the  
24 interagency groups, because I think part of the lack of good  
25 communication that day was, you know, if secretaries of

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1 energy and ministers of atomic energy of Russia have to be  
2 making statements about it, it must be really, really  
3 severe, and so, there were lots of mess-ups that day from  
4 our perspective that we can improve on.

5 But in terms of bounding it, I think it takes 24  
6 hours to bound one of these things. I really do. I think -  
7 - because you just don't have enough information.

8 So, that was more of a statement than a question.

9 The thing that struck us all that day, I will tell  
10 the public, was how could Japan have gotten to be so  
11 different?

12 We were shocked, because I think, in the first few  
13 hours, we heard that STA had not touched this facility since  
14 1992, and we all just were amazed at how different that was,  
15 and I think it's a regulatory failure.

16 I think the Japanese government has decided it was  
17 a regulatory failure on their part, was at least part of the  
18 problem.

19 Does anybody have a sense how one can get -- maybe  
20 Janice -- how the Japanese regulatory system could get so  
21 out of kilter not just with the U.S. but with European, with  
22 other regulatory systems?

23 MS. DUNN-LEE: Well, I don't have a very good  
24 answer for you there.

25 Japan, of course, is a mature nuclear country. We  
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1 consider them very like-minded, and we have regulatory  
2 cooperation and dialogue with them on a very regular basis,  
3 and I think it's a good question. I really -- I don't have  
4 an answer for that, how it got out of kilter. It isn't  
5 identical.

6 COMMISSIONER McGAFFIGAN: The charts on 9 and 10  
7 really -- you know, they're meant to say we don't have a  
8 problem, but they're really an indictment of the old  
9 Japanese system, old Japanese regulatory system.

10 I mean I'll tell you what I think part of the  
11 problem is.

12 I've followed Japan for a quarter-century, working  
13 first at Rand and then in the executive branch and in the  
14 Congress, and I honestly think -- and I think they're fixing  
15 it -- STA shouldn't have been in the regulatory business.

16 It's a small entity within a large research  
17 ministry. It's about to be combined and become a super-  
18 research ministry, and as I understand it, they're going to  
19 take most of the regulatory function out of STA and put it  
20 in MITI, but they're still leaving some self-regulatory  
21 within that large research institution that I fear will get  
22 lost, especially given this track record.

23 So, if there are Japanese members of the public  
24 listening, I would strongly suggest you think about, as  
25 Commissioner Merrifield already has alluded to, having an

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1 independent regulator regulating all of this stuff and  
2 regulating to world standards.

3 One of the comments in Nucleonics Week recently, a  
4 May 4th Nucleonics Week, was why hadn't Japan used, on the  
5 industry, more peer review, and the argument was, at least  
6 in this article, because open criticism involved in peer  
7 reviews does not mesh easily with the Japanese culture, and  
8 I think that that's again something -- I know it doesn't  
9 mesh easily with Japanese culture, but I would strongly  
10 suggest that they try to find a way to build in that sort of  
11 thing.

12 The NEI document that -- I'm going to use the  
13 bound version that was on our chair -- and it's good to be  
14 criticized from this direction -- suggests that we may have  
15 more than adequate regulatory oversight in this country in  
16 several areas.

17 On page 11 of their paper, they suggest that the  
18 single uranium conversion plant receives more than adequate  
19 regulatory oversight. They suggest the DDPS, you know, have  
20 continued intensity of regulation that may be  
21 disproportionate to risk.

22 That's on page 11, and then on page 13, they again  
23 suggest that we work to lower the regulatory burden on these  
24 sites.

25 There is, however, a clear opportunity for

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1 industry and NRC, working together, to enhance the  
2 regulatory paradigm.

3 Specifically with regard to the conversion  
4 facility and the gaseous diffusion plants, do you believe  
5 that we are over-regulating at the moment, that there is  
6 excess regulation?

7 MR. TROSKOSKI: No, sir.

8 You take a look at the bulk hazardous chemicals at  
9 the conversion facility, you fail any one of the large tanks  
10 that they have out there, and you look at the impact it will  
11 have to the members of the public, that will have an off-  
12 site impact.

13 Unlike a criticality, it will extend miles beyond  
14 the boundary.

15 They have the greatest concentration of bulk  
16 hazards, second only to the GDPs, and the greatest hazards  
17 at both of these sites are chemical hazards, and these  
18 chemical hazards are not something that will cause an  
19 increase in cancer 20 years down the line, they have the  
20 capability of killing people immediately.

21 So, I think we've got, currently, about the right  
22 look at these facilities.

23 So, I would respectfully disagree with our  
24 colleagues.

25 COMMISSIONER McGAFFIGAN: I do want to note -- and  
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1 Bill Kane is going to answer -- it's nice to be criticized,  
2 in a day like today, for over-regulating rather than under-  
3 regulating.

4 I'm glad we're in this boat and Japan is in the  
5 other boat.

6 COMMISSIONER MERRIFIELD: It's a good thing to be  
7 an independent regulator.

8 COMMISSIONER McGAFFIGAN: Right. It is.

9 MR. KANE: I think it's a fair question, and Bill  
10 touched on some of the things that we have got in the works,  
11 so to speak, right now.

12 I mean I would tick off Part 70 --

13 COMMISSIONER McGAFFIGAN: I think the new Part 70  
14 --

15 MR. KANE: -- which is intended to be more risk-  
16 informed; independent safety assessments, which are part of  
17 that, which have to be developed and form the basis for  
18 determining, you know, whether further changes are needed.

19 Our revised oversight program that we're working  
20 on is fully intended to make sure that we're spending just  
21 what we need in the right places, and finally, I would say  
22 that we're in the process now of reexamining our core  
23 program to determine across our core program where the  
24 resources should be, and this is -- and this is going to  
25 have a -- this is going to be a risk-informed re-look at the

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1 core program.

2 So, while, at one level, I think Bill's answer is  
3 correct, I think, at another level, we always need to  
4 examine our programs to make changes, and I believe that we  
5 have, with those three initiatives ongoing, I am sure that  
6 you're going to see further changes.

7 COMMISSIONER McGAFFIGAN: My last comment is a  
8 compliment to the staff.

9 Today's Inside NRC mentions the inspections by  
10 Region II and Region III at Westinghouse's plant in South  
11 Carolina and the hematite facility that's going to be closed  
12 in Missouri, and I remember a similar report that I read on  
13 the NFS Irwin inspection a few months ago.

14 I think it's inspections of those sort that are  
15 why we have a successful regulatory system. They identify  
16 issues early and make sure that the licensees stay attuned  
17 to them, and so, I compliment the staff for their work, and  
18 I'd point to, again, the Japanese public, look at those  
19 inspection reports and see how our staff does it.

20 MR. TRAVERS: If I could just make one quick  
21 comment, I happen to agree with that; I think inspections  
22 are important, and they're particularly important when you  
23 think of the changing nature, the dynamic nature of the  
24 business.

25 Very often what we find when we go in on an

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1 inspection is a fairly changed environment, you know,  
2 depending on the business at hand at any given point in  
3 time. So, it really has, from that perspective --

4 COMMISSIONER McGAFFIGAN: This is a business  
5 that's under stress, because as I think Commissioner  
6 Merrifield pointed out, hematite is going to close, there is  
7 consolidation occurring in the industry, and we need to be  
8 attuned to the pressures that come from that.

9 Thank you.

10 CHAIRMAN MESERVE: I have just a couple of small  
11 questions.

12 Your slide 12 -- you had pointed out about your  
13 emergency response -- our emergency response drills, and you  
14 indicated that they are periodic, and I'd be curious to know  
15 how often do we have them.

16 MR. TROSKOSKI: Biennial. Licensee drills are  
17 biennial, once every two years.

18 CHAIRMAN MESERVE: You indicated that state and  
19 local governments are invited to participate but didn't go  
20 on to say whether they do participate, and I wondered how  
21 active the state and local governments have been in that  
22 process.

23 MR. TROSKOSKI: I cannot tell you which states and  
24 local governments participate or don't, although I believe  
25 most of them do to some extent, but I couldn't give you the

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1 numbers offhand, sir.

2 MR. CONGEL: I can answer part of it. The smaller  
3 licensees -- there is a high variability, and we can get  
4 back to the Commission just what the extent of participation  
5 there is, and the bigger sites, particularly the GDPs, there  
6 is full government participation, just like it is around our  
7 power plant sites.

8 CHAIRMAN MESERVE: It seems to me that, if there  
9 are sites where there are high risks, we ought to maybe be a  
10 little stronger than invite, strongly encourage, and if  
11 there's Commission involvement to be necessary to help that  
12 along, we'll be happy to do it.

13 One of the other aspects of this accident that I'd  
14 be interested -- and this is information, largely. One of  
15 the things that surrounded the Tokai-Mura accident was that  
16 they were -- while they customarily were dealing with  
17 material fairly low-enrichment, they were -- had material of  
18 18-percent enrichment, and they were not following normal  
19 procedures, but it does raise a question, it seems to me, in  
20 my mind, about the extent to which we have a process that's  
21 like 50.59 that allows our licensees to make changes without  
22 prior NRC review, and you might say something about what  
23 kind of engagement we would have if, all of a sudden, the  
24 licensee were to be dealing with materials of different  
25 enrichment than they had analyzed before.

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1 MR. WEBER: Licensees are specifically authorized  
2 to possess and process certain enrichment material.

3 So, unless their license already authorizes them  
4 to process a higher enrichment, they wouldn't be allowed to  
5 possess that kind of material except, in some cases, small  
6 quantities.

7 With respect to a 50.59 process, the existing  
8 regulations in Part 70 allow licensees to make certain  
9 changes to their material control and accounting plans,  
10 physical protection plans, and emergency response plans,  
11 provided that they meet certain thresholds, without getting  
12 prior NRC approval, and one of the things the Commission  
13 will soon have before it is an opportunity to review what  
14 the staff recommends as a final change control requirement  
15 in the new Part 70 revisions.

16 Some licensees already have the flexibility to  
17 make those kind of changes under their existing licenses,  
18 but the new proposed requirement would allow that -- as  
19 consistent with the proposed rule -- would allow licensees  
20 in general to have that kind of flexibility.

21 We think that's a really important regulation, as  
22 reflected in the proposed rule, because it allows the  
23 flexibility, yet maintains the safety of operations.

24 So, it's something that has to be implemented  
25 quite carefully and in a controlled way.

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1 CHAIRMAN MESERVE: I'd like to thank the staff  
2 very much. This has been quite a helpful and informative  
3 presentation.

4 Our next panel will consist of various individuals  
5 who had participated in the preparation of the document that  
6 was prepared under the auspices of the Nuclear Energy  
7 Institute entitled "Assessment of Nuclear Criticality Safety  
8 and Emergency Preparedness at U.S. Nuclear Fuel Plants."

9 Those individuals consist of Mr. John Brons, who's  
10 from the institute, and two consultants, Mr. Robert Bernero,  
11 who is very familiar to many of us, and Mr. James Clark.

12 MR. BRONS: I'm Jack Brons, and to my left is Jim  
13 Clark, on my right Bob Bernero, as you know, who is somebody  
14 is very familiar to all of you.

15 You're familiar with Bob's experience. Jim has  
16 about 40 years' experience in the fuel processing industry  
17 and the waste management industry. My experience, similar  
18 duration, is primarily in reactors and with some relevant  
19 and significant experience in the conduct of assessments.

20 There is one note I'd like to make about the team  
21 as we begin this.

22 It was our objective when we put the team together  
23 to have individuals involved who have extensive knowledge of  
24 the fuel processing industry.

25 That brings with it some potential for conflict of  
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1 interest, and I would like you to know that Mr. Bernero has  
2 informed us before we began these reviews a continuing  
3 interest of some substance with the USEC, the gaseous  
4 diffusion plants, and the Mr. Clark has a continuing  
5 interest and involvement with NFS Irwin.

6 We accommodated those interests as we proceeded  
7 with the reviews.

8 Neither gentleman took any sort of a lead role  
9 when we were involved in that particular plant that was  
10 relevant to them, and so, in terms of discovery of issues  
11 and items, until the other two of us had come across  
12 something, they did not participate.

13 I think it's important to disclose that at the  
14 beginning, however, we were aware of those potential  
15 conflicts.

16 The review process that we did was put together on  
17 the basis of an industry initiative taken promptly after the  
18 accident in Japan.

19 We assembled the team, and then the first  
20 assignment for the team -- slide two, please -- was to  
21 identify for ourselves the factors contributing to the  
22 Tokai-Mura event, and I will not discuss each of the items  
23 listed on this slide. It is intended perhaps primarily as  
24 an index. I'll refer to some of these areas later on.

25 But to tell you what we did with them, once we

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1 determined these contributing factors, the team then  
2 identified a substantial listing of questions which we  
3 needed to address that got us at each of these points.

4 We provided that package of questions to the  
5 facilities together with an outline of how we would conduct  
6 our review.

7 They, in turn, then provided us with a reading  
8 package intended to address these questions that we had  
9 prepared in response to these contributing factors, we  
10 already read the NRC inspection reports for the two years  
11 preceding the event for each facility that was available in  
12 the Public Document Room.

13 When we arrived at the facility, our first part of  
14 the review was a very extensive question-and-answer session,  
15 then, with management, where we went over this set of  
16 questions that is conditioned on this contributing factors,  
17 while we tried to probe the degree to which the facility had  
18 a wholesome response to the questions we asked.

19 We then conducted a tour of the facility, visiting  
20 all the parts that we considered necessary to review  
21 criticality, safety, and emergency planning.

22 We conducted interviews of operators, supervisors,  
23 middle managers, and at the end of the first part of our  
24 review, weighing the results of the management presentation,  
25 the answers to the questions that we received in the

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1 interviews, and the observations that we had made during the  
2 facility tour, we then identified to the facility several  
3 areas that we would individually take on and do an in-depth  
4 review in order to determine the correctness of our  
5 observations or areas where we needed further information.

6 Then, when we were finished, we provided the  
7 facility with a debrief of our observations.

8 Next slide, please.

9 It was very clear to us that the fuel processing  
10 industry in the United States are clear beneficiaries of the  
11 regulatory and standards processes in the United States.  
12 The regulations and the standards are observed, and we  
13 believe that they provide for fundamental safety.

14 We did not observe any conditions that we  
15 considered to be of safety urgency during the course of our  
16 review. We had had discussions with senior staff before we  
17 conducted this review. We committed to them that, if we had  
18 anything that was of safety urgency, that we would bring it  
19 immediately to the attention of the facility and then  
20 facility would then report to you consistent with the  
21 regulations, but none of those conditions were observed.

22 The team concluded that the facilities are  
23 operating safely.

24 Next slide, please.

25 Our review was based not upon pure regulatory

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1 threshold, however.

2 We used as a basement for discernment in the  
3 development of our observations and findings at each  
4 facilities a standard of best industry practice.

5 Now, because this team and our review is  
6 relatively unique, admittedly, as we did the first few  
7 facilities, that standard was based upon the team's  
8 experience.

9 Later in the review and as benchmarked in this  
10 report which we've presented to you, the standard is, as I  
11 mentioned, not based on a threshold of regulatory or  
12 standards compliance but, rather, observed actual superior  
13 performance in the industry.

14 If we have described a best practice in this  
15 report, it is not a figment of our imagination or a wish  
16 list; it is actually being done.

17 Now, we have grouped -- I have grouped the factors  
18 here for presentation efficiency, and so, I will discuss the  
19 observations that we had on items one and two of that list  
20 of nine contributing factors, and they generally revolve  
21 around the safety culture for operations.

22 It was clear in Japan that there were some  
23 commercial pressures that led to the behaviors that led to  
24 the accident.

25 We found here that safety of operations is clearly

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1 the dominant focus.

2 All facilities provide some information to their  
3 workforce about their commercial situation. We found  
4 information in the dining room or the cafeteria or some out  
5 on the shop floor.

6 Our observation and the results of our interviews  
7 indicate that that business data is treated as simply that,  
8 business data, it's information, and we did not find any  
9 evidence that it was dominating operations.

10 It was very clear that the workers had a clear  
11 understanding that they had the authority and the obligation  
12 to stop the processes in place if they were uncertain or had  
13 a safety consideration.

14 We found, because part of our questions looked at  
15 the flow-down of procedures for consistency with license  
16 conditions, that we found that the procedures are consistent  
17 with the license conditions for each individual facility,  
18 and we found that the facilities are striving for procedural  
19 adherence.

20 They are not all achieving procedural adherence.

21 We found in some instances that the expectations  
22 of management for use of the procedures is sometimes poorly  
23 communicated and certainly, in many instances, variously  
24 understood by the workforce.

25 Now, that said, we did not observe conditions

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1 where people were not following procedures.

2 What we found instead were situations where the  
3 expectation of management might easily be interpreted as the  
4 procedure should be open and available as you perform it  
5 step by step.

6 The nature of the operations do not permit that.

7 The workforce generally performs repetitive  
8 efforts, and we have described that in the report, and they  
9 generally are certainly intent on following the procedures,  
10 but there is a gap between expectations as expressed by  
11 management and the actual practice in the facilities.

12 We have noted in our report what we've found in  
13 the way of best practice, and in this area what we would  
14 describe as best practice is that there was a very  
15 thoughtful policy on the part of management describing how  
16 procedures should be used.

17 Mechanisms were in place to facilitate the use of  
18 procedures in that manner. It was well communicated to the  
19 workforce, supported, enforced, and the understanding of the  
20 workforce was congruent with the expectations of management,  
21 and that does exist at some facilities out there.

22 Next slide.

23 The nuclear criticality safety program we found to  
24 be one marked by uniform adoption of the double-contingency  
25 principle.

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1           It is an underlying feature of criticality safety  
2 that involves the use of double contingency.

3           We found a preference for the use of engineered  
4 controls throughout the industry; that is, practices which  
5 are aimed at eliminating administrative controls,  
6 administrative controls being those that are primarily  
7 dependent upon human behavior and engineered controls being  
8 those which are built into the process.

9           We found some use of triple-contingency practices  
10 out there; that is, where the facility had identified and  
11 put in place an additional level of contingency, and the  
12 team has noted that that is both a plus and a minus.

13           In some instances, the application of another  
14 layer of contingency confronts the operators with additional  
15 sets of data that can promote confusion.

16           So, the -- while the concept of building in  
17 additional layers of safety is an important and valuable  
18 one, it must be done in a very thoughtful and rational way  
19 or it can cause confusion.

20           There is also a widespread use and expectation  
21 that nuclear criticality safety postings will be deployed in  
22 the plant, and we did find, to some extent, that there is a  
23 variable effectiveness to those postings, and in particular,  
24 if they come out of the print shop and they are not  
25 necessarily printed in the right size or they're not posted

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1 in the right location, then they can't be as effective as  
2 they might be.

3 In that regard, in the area of best practice, we  
4 found a number of things, and relative to the postings,  
5 where the operations department has a significant control  
6 over how those criticality postings are deployed, and the  
7 way they're printed and placed in the plant seems to enhance  
8 their effectiveness considerably.

9 Other best practices that we observed were cross-  
10 train surveillance.

11 This is referring to the fact that, at some  
12 facilities, radiological technicians have been trained to  
13 observe for criticality safety issues or engineers are used  
14 to do surveillances for criticality safety issues, and we  
15 found that to be a significant plus, and other facilities  
16 have very rigorous programs that systematically challenge  
17 administrative controls that remain in place.

18 Next slide, please.

19 Now, I want to stress, as I leave the nuclear  
20 criticality safety area, that it was not this team's  
21 objective to review the applications and calculations behind  
22 standards and codes used to define criticality measurements.

23 Rather, our focus was on the management of  
24 criticality safety, and so, in this view-graph, I'm  
25 discussing or outlining the issues that we discussed or

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1 found relative to areas of management, training, and  
2 oversight, items four, five, and six on the index of  
3 contributing factors.

4 We found that the use of event experience from  
5 Tokai-Mura was not as aggressive as we would have hoped. We  
6 found everyone familiar with the Tokai-Mura event, but in  
7 our view, it was an occasion to very forcefully use it to  
8 reinforce standards in place, and generally, the event was  
9 used as simply communication of an occurrence and  
10 information to the workers, rather than a very vigorous,  
11 gee, this happened, we want to use it as forcefully as we  
12 can.

13 We also found some weakness in the understanding  
14 of criticality and the factors used to control criticality.

15 We found across the board understanding that  
16 criticality is a significant event, we found across the  
17 board understanding that criticality can occur here, but  
18 when you get down to defining exactly what a criticality is,  
19 many workers were weak in that regard, and that led to a  
20 subsequent weakness in understanding the controls that are  
21 used relative to criticality; that is, geometry, moderator  
22 control, and so on.

23 They were unable to relate those terms, a term  
24 like moderator or spacing, to the physical occurrence of  
25 criticality.

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1           Relative to the qualification process, we found,  
2 really, two types of qualification processes out there, one  
3 which I will call a very formal qualification card, lots of  
4 documentation behind the qualification of a worker, and the  
5 other being more of an apprentice/journeyman relationship in  
6 qualifying and training people.

7           The team did not observe any significant  
8 differences in the results of either of those two processes,  
9 but we have suggested to the industry that, where the  
10 apprentice/journeyman-type approach be used, that there  
11 should be some management oversight processes to review the  
12 quality of that work or that effort.

13           We found supervisory involvement to be very, very  
14 good throughout the board. We found active engagement of  
15 supervisory personnel and middle management engineering  
16 personnel in the plant observing the processes whenever we  
17 were there.

18           In terms of operating procedure control, all of  
19 the facilities have a process for controlling changes and  
20 allowing the workers to know whether or not changes are --  
21 have been instituted to procedures that they are using.

22           We find in some instances, however, that the --  
23 where the number of changes is frequent, many of them for  
24 administrative reasons or something of that nature, that the  
25 processes for raising awareness of changes that are

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1 substantive is weakened.

2 We looked at configuration and restart control,  
3 and we found it was good, and the staff noted to you, our  
4 regulations require certain reviews before starting  
5 processes.

6 The requirements for restarting processes or  
7 infrequent process are less well-defined in the regulation.  
8 Nevertheless, we found that they are widely used in the  
9 industry, and the team suggests that that practice, which is  
10 not required in most cases by regulation but which is done  
11 at all facilities, is a very substantial point that would  
12 minimize the likelihood of an event similar to Tokai-Mura's.

13 In the audits and surveillance areas, we found  
14 that all are being conducted in accordance with their  
15 licenses. The results are -- leave room for improvement.

16 I would summarize what we found by saying that  
17 routinely-required audits are producing routine results.  
18 The audits which are done for special purposes are producing  
19 more worthwhile results.

20 In terms of corrective actions, we found that the  
21 programs -- many of them are diffuse, and it was of some  
22 concern to us that the -- there seems to be a built-in  
23 deference to NRC results or findings.

24 If a relatively routine item is identified by an  
25 NRC inspector, it may well assume a level of importance that

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1 exceeds a more important issue identified by facility  
2 management, and we identified that to the facilities.

3 In terms of best practices, we found that there  
4 were some facilities that had very infrequent operating  
5 procedure changes, that they were tightly controlled, that  
6 the workforce understands what criticality means and all of  
7 the terms involved with control of criticality, and that the  
8 qualification processes and use use selected highly-trained  
9 individuals and that there are oversight programs supporting  
10 management objectives and that those oversight programs  
11 engage more than just the functional staff; that is, they  
12 take advantage of other people in the plant for oversight.

13 Next slide, please.

14 In the area of instrumentation and dosimetry, as  
15 you heard earlier from the staff, there are very specific  
16 regulations and requirements, and in our review, we  
17 determined that all aspects that we received were fully  
18 acceptable.

19 As a result of determining that fairly quickly, we  
20 did not perform a sufficient in-depth review in that area to  
21 identify what we would call best practices, and so, none are  
22 listed in terms of instrumentation dosimetry; it's certainly  
23 a very acceptable program that's out there.

24 In terms of emergency preparedness, we found plans  
25 and very good facilities in place at each one of the 10

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1 locations.

2 The scope of exercises and drills is appropriate  
3 to the risks.

4 We found that, while all of them considered the  
5 prospect of criticality as one of the events -- that is, all  
6 of them except for the conversion facility, which does not  
7 have a risk of criticality -- considered criticality but few  
8 had provided full consideration to the notion of an extended  
9 criticality; that is, what would they actively do if a  
10 criticality went on for some 19 hours, as it did at Tokai-  
11 Mura, how would you stop it, and lastly, there was some  
12 weakness that we discovered in terms of understanding how to  
13 deal with highly-irradiated staff that might be involved in  
14 an accident.

15 In terms of best practice, we found an excellent  
16 emphasis on events with the highest probability and the  
17 worst case situation was thoroughly considered.

18 In the area of regulatory oversight, as the staff  
19 noted, there was clearly an element of inadequate regulatory  
20 oversight at Tokai-Mura.

21 We reviewed the inspection reports, we reviewed  
22 how they were treated at the facilities, and in our view,  
23 the regulatory oversight is sufficient or more than  
24 sufficient. We felt that the oversight at the highly-  
25 enriched uranium facilities and the low-enriched facilities

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1 is about right. We felt that the oversight at the gaseous  
2 diffusion plants and the conversion facilities may be more  
3 than is needed.

4 Next slide, please.

5 Overall, this was a very unique opportunity, and  
6 we've come up with this category which we call results  
7 integrated, which goes a little bit beyond our charter. We  
8 limited ourselves very much to the focus on the contributing  
9 factors point.

10 Nevertheless, we had three people with a  
11 reasonable amount of experience who had completely open  
12 access, and we were focused on safety, and we visited all of  
13 the facilities one after another.

14 So, that gave us a view which is not commonly  
15 achieved.

16 We are also very mindful, as your questions  
17 earlier have indicated, that the competition and  
18 consolidation in the industry makes this a time of  
19 transition which is one where there is a need for great  
20 vigilance.

21 We found that the facilities have not, for a  
22 variety of reasons, proprietary and in some cases  
23 constraints provided simply because of the merger and  
24 acquisition activity that's going on, do not talk to each  
25 other as much as might be desirable, and there's been some

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1 concern about sharing proprietary information or shielding  
2 proprietary information, but we think, in this time of  
3 competition and consolidation, that most of the items that  
4 we have identified as best practices in this report have  
5 nothing to do with the proprietary nature of the processes,  
6 and we do believe that there is an opportunity for the  
7 industry to do more benchmarking, which should improve both  
8 the efficiency and, along with it, the safety of all these  
9 facilities.

10 When we took some consideration of the facilities  
11 themselves and the basic processes, it led us to some  
12 consideration of the concept of risk and the regulatory  
13 process, as well.

14 We noted that both management and the NRC, in some  
15 areas, seemed to be treating the facilities with programs  
16 similar to those used at reactors. So, we would note and  
17 were fairly forceful in our report to say these are not  
18 reactor.

19 As you've noted in your discussion earlier,  
20 relative to criticality, the risk is almost exclusively on-  
21 site. The off-site risk is low, and it is primarily  
22 chemical and process risk and is certainly -- these  
23 facilities are different enough in their operations that the  
24 one size fits all approach to regulation does not seem to  
25 fit.

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1 Next slide, please.

2 Again, coming back to our conclusions, the team  
3 noted at the start of this that the consensus was that the  
4 regulatory process was sufficiently vigorous and different  
5 in the United States that the risk of an accident was  
6 relatively lower and that the facilities in the United  
7 States could be expected to be operating safely.

8 Based upon our review, we are able to affirm that  
9 view.

10 Nevertheless, we found some opportunities where we  
11 think that there are places where safety or operations can  
12 be improved, but we do note that the assumption that is used  
13 in the United States -- that is, that criticality can happen  
14 here -- is a very sound basis for safety planning and should  
15 remain.

16 That concludes our report.

17 CHAIRMAN MESERVE: I'd like to thank you all for a  
18 very helpful report.

19 On the one hand, it's reassuring, but on the other  
20 hand, you have raised some issues that present some issues  
21 for us as we think about these facilities in the future, and  
22 obviously, you've raised some issues that ought to be of  
23 interest to the organizations that you evaluated in the  
24 course of your review.

25 There's one area where I had -- I want to explore

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1 a little bit further with you -- that I had -- I may not  
2 have quite understood your comments.

3 You indicated that there was a gap in the  
4 expectations of management with regard to procedures and  
5 procedural compliance and what was really going on. You  
6 couple the existence of what you observed with your comments  
7 about worker understanding of criticality issues and  
8 consequences of purpose of various of the controls, and that  
9 combination is not suggestive of a very good situation, and  
10 I may have misunderstood the nature of the gap that you  
11 perceived, but could you comment further on that?

12 MR. BRONS: Certainly, and then I'll invite Bob  
13 and Jim to comment.

14 Many of the facilities are using -- if you talk to  
15 the senior management, you will hear the term that we  
16 operate by verbatim compliance with the procedures.

17 Now, that implied to this team -- verbatim  
18 compliance implies a perform steps exactly as written mind-  
19 set and operation and generally requires open reference to  
20 step by step as you are performing the procedure.

21 When we talked to the operators themselves -- and  
22 this is uniform, at all the facilities -- we found a very  
23 rapid willingness to say we follow procedures.

24 There's a clear intent to follow procedures on the  
25 part of management and the workers.

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1           So, then, the gap I referred to is what does this  
2 statement of management mean? How do they expect it to be  
3 carried out? And as we interviewed various managers, we got  
4 different impressions of what they mean by verbatim  
5 compliance.

6           As you talked to the workers, you found that they  
7 variously interpreted those statements as well.

8           As I mentioned, what you see in these where you're  
9 doing repetitive procedures in most cases is that the  
10 workers are trained in the procedures and they perform them  
11 without immediate reference to the procedure at any given  
12 time.

13           When you go and look at the items that have been  
14 collected by the facility or that are visible in NRC  
15 inspection reports, you find a number of instances of  
16 procedural -- non-compliance with procedures.

17           Well, if you have an expectation that it's  
18 verbatim compliance and the workforce says that they intend  
19 to comply and they are not, it indicates that there is an  
20 understanding on the part of the workforce that their charge  
21 is to comply with the intent of the procedure.

22           Now, that's different than verbatim compliance.

23           So, it's that gap in communication that I talk  
24 about and an understanding of how is this procedure to be  
25 used and how does a worker perceive it should be used.

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1 CHAIRMAN MESERVE: I guess I'm not following why  
2 you don't see a safety concern that arises from that gap in  
3 a situation in which, as your report indicates, there is  
4 maybe incomplete knowledge by the workers of the  
5 consequences of departing from procedures.

6 MR. BERNERO: I would like to offer something on  
7 that.

8 In the case of criticality safety and worker  
9 understanding, for example, we encountered workers who  
10 recognized that there was an importance to these criticality  
11 safety controls, even when they were very unhappy with them,  
12 you know, like restrictions about you can only move one  
13 container at a time.

14 The thing we're pointing out in worker  
15 understanding is their understanding of the nature of a  
16 criticality or the controlling factors moderator mass and so  
17 forth depended too much, in our view, on recognizing the  
18 importance because they were told it was important, and it  
19 would be very helpful, we think, that the workers understand  
20 further why these controls are important.

21 Now, there is, indeed, an underlying safety  
22 question.

23 You know, you obviously want a well-trained worker  
24 to adhere to strict controls for criticality safety and to  
25 understand why he or she is doing it, and therein lies a

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1 potential for a weakening of safety control, but our concern  
2 with procedure adherence is a much more general things,  
3 where very few facilities laid out a coherent structure --  
4 this procedure will be in hand, when you do the thing, you  
5 do it and you check off or in some way follow it step by  
6 step. This other procedure, you will memorize and you will  
7 do it, you know, it will be there on file, you will have  
8 training updates periodically, and then, other procedures,  
9 you follow an intent or you have more flexibility.

10 That's a more prevalent problem where we have the  
11 management saying tight adherence or verbatim compliance and  
12 then the actual practice was more fuzzy.

13 MR. BRONS: I would take it a step further.

14 The answer to your question is there can be a  
15 safety concern in the issue that we raise.

16 I would tell you that our observation was, where  
17 the steps in the procedure or the requirements involved  
18 criticality safety postings, we don't think there was any  
19 ambiguity at all, and indeed, those are posted generally,  
20 some places not as effectively as others but there for the  
21 worker to see it.

22 There's almost a step out of the procedure, for  
23 instance, it becomes this posting.

24 So, there's less concern from the standpoint that  
25 this lack of -- the gap that I describe in procedural --

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1 between expectations and actual performance will affect a  
2 criticality safety issue, but they certainly do have issues  
3 of procedural non-compliance, because in cleaning a  
4 component or something like that, there is a procedure.

5 The worker follows what he believes to be the  
6 intent of it, ends up with a spill of powder or what have  
7 you. Well, that is an issue, and it comes from this gap  
8 that I talk about.

9 So, there's an area to work on, but I think it's -  
10 - relative to criticality safety, it was not a concern of  
11 ours.

12 CHAIRMAN MESERVE: I have just one other question.

13 Your report is an excellent one in identifying  
14 areas of where there might be some improvements that could  
15 be made, identifying best practice, and I'd be curious if  
16 you have any sense of the response of the beneficiaries of  
17 your study to those recommendations.

18 Some of them don't necessarily involve us but are  
19 ones that I think you would urge the industry to consider,  
20 and I'd be curious as to whether you have any insight to the  
21 reaction to the report.

22 MR. BRONS: Yes. Thank you for asking that,  
23 because one of the things I forgot to do was acknowledge the  
24 fact that we have representatives of all the facilities  
25 here, and the response has been excellent.

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1           This initiative was established without a basis  
2 that -- we weren't setting up a new organization, so they  
3 did not have an obligation to respond to us. Nevertheless,  
4 we have heard from all of them.

5           They've been appreciative of the comments that we  
6 provided.

7           We understand that they have also provided the  
8 details of the findings at each facility to the NRC  
9 inspectors that visit, so that the individual details have  
10 been provided to your staff, and that that has been fed back  
11 to the headquarters staff here.

12           But relative to the facilities themselves, I'm  
13 aware of some outreach to INPO, for example, to help some  
14 facilities on some items, that that's occurred.

15           I am aware of some communications between  
16 facilities, where they're trying to share practice, and we  
17 have had industry discussions about establishing some sort  
18 of benchmarking activity and moving ahead with that.

19           Those plans have not been solidified, but there  
20 has been a high level of interest, and we understand that  
21 they're taken our recommendations very clearly.

22           CHAIRMAN MESERVE: Seems to me that would be a  
23 very valuable activity.

24           MR. BRONS: Yes, sir.

25           CHAIRMAN MESERVE: Commissioner McGaffigan.

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1           COMMISSIONER MCGAFFIGAN: I want to join the  
2 Chairman in commending you for the report. I think it's  
3 excellent work on your part, and I'm glad everybody in the  
4 industry voluntarily worked with you.

5           Your first slide had a list of nine factors  
6 contributing to the event, the last of which was inadequate  
7 regulatory oversight, but as I read that chart, the first  
8 eight almost derive from nine.

9           I mean if you have an inadequate regulatory  
10 oversight, then you're likely to have permitted deviations,  
11 tacit approval of procedural deviation, insufficient  
12 training, insufficient administrative controls.

13           A lot of that falls from not having a regulator,  
14 and as we know, this facility had not been touched by the  
15 regulator since 1992 prior to this event.

16           Do you all have any sense -- I mean I asked the  
17 first panel -- it was not your charter here -- how Japan got  
18 so different from not only us but from European practice?

19           MR. BRONS: Certainly on my part, it is pure  
20 speculation.

21           I personally believe that the root cause is the  
22 decision that was made at the time the facility was  
23 originally licensed that the assumption would be made that  
24 criticality was proscribed by virtue of having procedures in  
25 place, and that allowed everybody to say, well, if that's

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1 the case, then we don't need to regulate.

2 I believe that that's the reason, but I don't know  
3 that.

4 MR. CLARK: I second that. I was stunned that the  
5 Japanese could get into this fix, and I came to the  
6 conclusion that their belief that it couldn't happen was  
7 what led it to happen.

8 MR. BERNERO: I would just like to add that we all  
9 had that same reaction, but then we turned away from further  
10 pursuit of it, as our report says.

11 We tried to focus on these nine contributing  
12 factors as the basis for a comprehensive scrutiny of the  
13 U.S. facilities and not to try to fully evaluate the  
14 Japanese event.

15 COMMISSIONER McGAFFIGAN: Your report -- as I  
16 asked the first panel -- and as I said, I'm happy to be  
17 being criticized from being an over-regulating regulatory  
18 body when we're dealing with events of this sort, but your  
19 report does suggest that, with regard to the uranium  
20 conversion plant and the gaseous diffusion plants, we may be  
21 over-regulating at the moment.

22 Do you want to elaborate more on that, and is the  
23 new Part 70, in and of itself, with the ISA and all that,  
24 going to fix it, or is there more that needs to be done?

25 You also heard the staff's reaction.

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1 MR. BERNERO: Recognizing what was said about the  
2 potential conflict of interest with the gaseous diffusion  
3 plants, let me turn to the conversion plant and just note a  
4 couple of historical factors that influenced this.

5 In the old days, when the environmental impact  
6 statements were done on fuel cycle facilities, the off-site  
7 chemical risk was not a factor, because it was not NRC's  
8 jurisdiction.

9 Then, with the Sequoyah Fuels accident, there was  
10 a legal analysis that said, if it's part of your process,  
11 you have to consider it, and so, there ensued a great deal  
12 of chemical risk regulation.

13 The gaseous -- the conversion plant has the  
14 peculiarity, if you have ever visited it -- I know some of  
15 you have -- the radiological risk is basically the ore yard  
16 and doesn't get spread, and that hasn't been a matter of  
17 contention, but the chemical risk of UF-6 is quite small  
18 compared to the chemical risk of hydrofluoric acid which is  
19 in outdoor tanks that are massive and so forth, and in fact,  
20 the state participation in any emergency exercise is that  
21 which would be associated with chemical plant risk, and so,  
22 the NRC finds itself, in regulating a Part 40 licensee, to  
23 have -- as part of its license application, have an  
24 appropriate emergency preparation, and you're regulating  
25 chemical risk, and you have a very tenuous connection to the

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1 dominant chemical risk, and so, it does raise a very serious  
2 question about the degree of regulation that is appropriate,  
3 and of course, that facility gets tourists and inspectors in  
4 rather large number, which is -- it's a practical matter of  
5 over-regulation.

6 Calvert Cliffs went through that when they were  
7 first licensed, and any reactor near Washington would get  
8 lots of tourists, and with the gaseous diffusion plant in  
9 Paduca, across the river, I'm sure whoever visits says,  
10 well, I'll kill two birds with one stone.

11 Well, one of those birds -- it gets a lot of those  
12 tourists.

13 COMMISSIONER McGAFFIGAN: We also have an MOU with  
14 OSHA, and we have some responsibilities for looking at the  
15 chemical side, don't we? I mean you're suggesting that --  
16 or is there some other regulator who will deal with the  
17 chemical risks there?

18 MR. BERNERO: The MOU with OSHA -- which, by the  
19 way, was developed years ago, when I was here. The MOU with  
20 OSHA is with regard to worker safety, and the dominant risk  
21 -- and I think the staff even said it in the earlier  
22 briefing -- is the chemical risk off-site, and if you look  
23 at the emergency plans and the seismic analyses, that plant  
24 has done seismic analyses, and it's chemical risk, and  
25 that's not OSHA.

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1           COMMISSIONER MERRIFIELD: If I can jump in, I used  
2 to deal with some of these issues when I was on the Senate  
3 environment committee.

4           Part of it, you know, looking at the glass as  
5 being half full or half empty and saying, well, in  
6 comparison to the other chemical side of the house, the NRC  
7 regulation is too much.

8           The question of some may be not that we have too  
9 much but that others have too little, and I would want to  
10 put that out for the record.

11           COMMISSIONER McGAFFIGAN: I would tend to agree.  
12 Jack, you wanted to say something in addition.

13           MR. BRONS: Well, I really think that Bob has  
14 adequately described the risk side of it.

15           Just to cover both of those facilities, I really  
16 think the issue at the conversion plant is the one that's  
17 related more to the tourism.

18           They just get a lot of visits because they're  
19 close to the gaseous diffusion plant, and frankly, that ends  
20 up in a pretty substantial number of billable hours, which  
21 is surprising.

22           COMMISSIONER McGAFFIGAN: You're talking about  
23 tourism by NRC staff.

24           MR. BRONS: Yes, sir.

25           The gaseous diffusion plant -- I think our take on

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1 that would be that the issue is confused by a whole host of  
2 legacy issues related to the presence or prior DOE issues  
3 there, and our -- part of our contention there was  
4 basically, if you look at the inspection reports for the  
5 gaseous diffusion plants -- as I mentioned, we looked at two  
6 years of reports for each of these facilities.

7 Frankly, we ultimately, in all honesty, only  
8 reviewed one year's worth of the gaseous diffusion plants,  
9 because the volume was so great, just huge by comparison,  
10 and when you consider the level of enrichment that's  
11 licensed there and the nature of the operation and the  
12 nature of the risks, it just didn't seem to stack up.

13 COMMISSIONER MCGAFFIGAN: The problem is -- and  
14 again, today's Inside NRC has a separate article about a  
15 stand-down at one of the gaseous diffusion plant, the  
16 Portsmouth decontamination facility, because of 22 largely  
17 self-found safety violations, and they closed it down, and  
18 they are going to start up this week, according to the  
19 article.

20 The spokesman for USEC says that these were  
21 criticality issues of low significance. It's very difficult  
22 to make a criticality event occur, she said. It just goes  
23 to show how rigid these NRC requirements are. NRC also  
24 stated the safety requirements -- or significance is low.

25 So, maybe we're finding stuff that is of low

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1 safety significance, but it still seems like, when we send  
2 in an inspection team, we find a lot of stuff there, and so,  
3 we need to figure out at some point whether the stuff we're  
4 finding is significant and it's significant enough that they  
5 actually closed the facility down for a few days to try to  
6 get all of -- you know, make a complete audit of the things  
7 that were wrong before they started up again.

8 MR. BRONS: Well, there are some threshold  
9 questions related to the characterization of criticality  
10 safety issues that need to be looked at.

11 So, the primary suggestion we made -- and it was  
12 on my first slide -- is that these facilities are the  
13 beneficiaries of a sound regulatory process.

14 COMMISSIONER McGAFFIGAN: I agree.

15 MR. BRONS: I don't want this discussion to  
16 detract from that.

17 COMMISSIONER McGAFFIGAN: I tried at the outset -  
18 - although I ended up making -- putting too much emphasis  
19 here -- I think that the fundamental conclusion of your  
20 report is sound, and I think we all appreciate the detail  
21 that it's gone into, and that fundamental finding at the  
22 outset is a wonderful finding.

23 Thank you.

24 CHAIRMAN MESERVE: Commissioner Merrifield.

25 COMMISSIONER MERRIFIELD: When I visited the

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1 Paduca facility, I did not go to the conversion plant.

2 COMMISSIONER McGAFFIGAN: You're not a tourist.

3 COMMISSIONER MERRIFIELD: I will go there  
4 separately and alone, and I would say, further, that of all  
5 the places that I have visited as NRC Commissioner, never  
6 once have I felt like a tourist.

7 Let me first turn to -- I don't know what page it  
8 is on your slides, because ours aren't numbered, but it's  
9 the results relative to safety culture for operations, and  
10 it's not mentioned in your slides, nor was it mentioned by  
11 our staff -- you know, we obviously -- we talk a lot about a  
12 safety conscious work environment and having a situation in  
13 which the workers at the plants, whether it's a fuel cycle  
14 facility or at a generating station, have a willingness to  
15 raise concerns.

16 One of the issues that isn't here relates to our  
17 allegation process.

18 Now, this has been a bone of contention on both  
19 sides.

20 There are some who feel that we're not as vigorous  
21 as we should be in following up on allegations, and there  
22 are some in industry who perhaps feel we are too aggressive  
23 in following up on allegations, but the process is what it  
24 is, and it does provide an opportunity for workers who have  
25 disagreement with the way in which the management is

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1 operating the plant to raise that to the NRC and allow our  
2 investigation and enforcement folks to take a look into it.

3 I'm not fully cognizant of the situation in Japan.  
4 I don't think they have a system which is quite like ours,  
5 but as a general question, do you think that the existence  
6 of that allegation process is also a contributing factor to  
7 differentiating the safety at our plants from perhaps those  
8 in Japan?

9 MR. BRONS: We did not look into or obtain, to the  
10 best of my knowledge, any information about allegations at  
11 any of the facilities.

12 What we did do, though, was ask the workers  
13 themselves, and the middle managers and the engineers that  
14 we talked to, about how comfortable they were in some of  
15 these things that we were told that they were expected to  
16 do.

17 For example, all facilities said our people are  
18 free to stop the process whenever they want. Well, one of  
19 our questions to the workers was do you feel like you'd be  
20 supported if you did that, and I was astonished at the  
21 wholesome answers that I got. They were very good. They  
22 felt that they would be strongly supported in making a  
23 decision to shut down the process.

24 So, that was a factor in my mind that led me to  
25 conclude that we have a very healthy safety environment, but  
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1 we didn't get into allegations at all.

2 MR. CLARK: We didn't specifically talk about  
3 allegations, but in the discussions, the interviews,  
4 discussions were relatively random. There were some picks  
5 by management based upon what time of day or something.

6 They were very frank. They were generally  
7 private. There was no indication that people were holding  
8 back anything. They knew, I believe, that we were there to  
9 help the facility.

10 They knew that we would hold confidential our  
11 discussions, by name, that we were having with them, and to  
12 a person, they were -- seemed to be very comfortable with  
13 what they were telling us and the safety of the facility.

14 Technically, they had a broad spectrum of  
15 capability, but you had a sense that they felt safe, that  
16 they felt that they could communicate, especially with their  
17 supervisors, about any concerns that they might have.

18 MR. BRONS: We did have one facility where a  
19 number of workers -- all three of us experienced in  
20 interviews -- raised an issue of concern about one part of  
21 the process, and all said that they had raised that to the  
22 management, we found, in pulling the string, that, in fact,  
23 management had a list of concerns that they had heard from  
24 workers, and it happened to be the item that was brought up  
25 to us was the top item on the list. Management had it there

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1 to address. There we counseled management you ought to feed  
2 back a little better to your people about this list, but it  
3 clearly was being heard, and they felt free to bring it up.

4 COMMISSIONER MERRIFIELD: I think that's very  
5 positive. Hopefully, upon our own investigation and  
6 discussions with those workers, our inspectors would  
7 hopefully get the same kind of answers about a willingness  
8 to raise safety concerns.

9 I'd like to turn to the next results page relative  
10 to emergency preparedness.

11 The third bullet you have talks about the  
12 consideration of extending criticality and highly-irradiated  
13 personnel.

14 My reading on the incident at Tokai-Mura -- one of  
15 the issues there was the fact that the two -- or the three  
16 individuals who were injured, two of whom, as we mentioned,  
17 have subsequently died -- there was some confusion about  
18 what facilities to take them to in order to receive  
19 appropriate medical treatment, and in fact, at least one of  
20 the individuals had to be shuttled from one facility to  
21 another in a relatively quick succession.

22 Do we have -- do you think that there is  
23 sufficient understanding of how to treat personnel who have  
24 these injuries, and does that follow through -- or do you  
25 have any understanding of whether that follows through to

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1 the facilities that would receive those personnel, and are  
2 there some things that we need to do to follow up on that to  
3 make sure that, if there are individuals who receive, in the  
4 unfortunate and hopefully highly unlikely situation that  
5 they would receive doses, that we have identified and the  
6 licensees have identified facilities to receive those and we  
7 have the right plans in place?

8 MR. BRONS: As I mentioned, this is an area where  
9 we felt that there was some weakness, and I'd like to break  
10 your question down into two parts.

11 None of these facilities is located very close to  
12 some place that would ultimately manage these people, and  
13 so, one of our questions about the treating of highly  
14 irradiated personnel was focused on will the interim  
15 facility -- because all of them have arrangement with a  
16 local hospital, and they generally have trained that  
17 hospital in treating people who are contaminated, but as you  
18 well understand the issues for persons highly irradiated,  
19 where vomit may be radioactive, the fillings in their teeth  
20 may be radioactive, there's a dose to the care workers, that  
21 may not have been explained to the local receiving hospital.

22 So, one aspect, we were trying to promote the  
23 increased training of the local hospital to deal with that  
24 issue.

25 Relative to the second issue, in almost all cases,  
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1 it would require helicopter evaluation to the ultimate  
2 facility, and although there were some exceptions, it was  
3 our belief that the facilities knew where the people would  
4 go ultimately -- that is, what was the teaching or major  
5 medical center that was able to care, and our concern was  
6 have you really nailed down the transportation arrangements,  
7 so we don't have to rely on what we think they know how to  
8 do it, and that was our concern.

9 Now, beyond that, we did not get at all into the  
10 qualifications of the ultimate facility to handle radiated  
11 people. It's beyond our capability.

12 COMMISSIONER MERRIFIELD: Mr. Chairman, I think  
13 this is an area that we may have identified an action item  
14 on which we need to work with our Federal and state  
15 counterparts to make sure we've got this well in hand in  
16 the, as I said, highly unlikely event that this might occur  
17 here.

18 Thank you.

19 CHAIRMAN MESERVE: Commissioner Diaz.

20 COMMISSIONER DIAZ: Yes. Thank you, Mr. Chairman.

21 Again, I thank you for your good report and your  
22 observations.

23 Let me just look at your -- I think it's page six.  
24 It's your contributing factor four, five, six slide, and at  
25 the very bottom, it says corrective action programs diffuse

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1 differential to NRC.

2 A quick statement. I've always stated and I  
3 continue to believe and, I think, will continue to believe  
4 that, you know, safety is in the hands of the people that do  
5 the work, and our interaction is very important in  
6 delineating what their actions are, but they do it, and I'm  
7 a little concerned with the corrective actions programs  
8 diffuse and differential to NRC.

9 Will you explain what you mean by that?

10 MR. BRONS: Yes.

11 The meaning behind corrective action is diffuse is  
12 that many of the facilities have a number of internal  
13 oversight programs.

14 Many of them take the results of those individual  
15 internal programs and have their own tracking list.

16 So, there might be an oversight program that's  
17 generated by the operations department, and it's got its own  
18 list of corrective actions and tracking and follow-through  
19 and so on, and then there may be another one from the  
20 nuclear safety organization that has its own list of  
21 corrective actions and so on, and yet another from the  
22 regulatory affairs department, if there was one. I'm just  
23 creating a hypothetical case here.

24 So, when we talk about diffuse, we're talking  
25 about those deficiencies being managed in separate programs,

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1 so that it's very difficult for management to identify  
2 trends or make cross-comparisons to importance of issues or  
3 even prioritize the work for their force.

4 Now, many of the other facilities have put that  
5 into a common system, and that was really what we would  
6 describe at a best practice facility, is they have a common  
7 corrective action program.

8 So, that's the term diffuse.

9 The deferential to NRC is exactly the idea I  
10 expressed earlier, and that is that we found, in some  
11 instances, where there was a separate corrective action  
12 program for NRC-identified items, and if you asked  
13 management about the corrective action program that they  
14 were tracking and trending and following, that's the one  
15 they referred to, and the ones that had items identified by  
16 their own staff seemed to be of lesser name recognition and  
17 importance.

18 COMMISSIONER DIAZ: I think that is an issue that  
19 I thank you for bringing it to our attention, and I am going  
20 to look forward to our staff to address it sometime.

21 Now, that's the hard part of my questions.

22 The next one is just having some fun, and I have  
23 to have some fun.

24 I'm going to go back to this slide in which you  
25 talk about the extended criticality, number seven, and you

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1 know, I've been listening intently to you talking about how  
2 the operators, you know, train and it's important to have  
3 the criticality training, how all these things are, and I  
4 just want to get some of the nomenclatures and the issues  
5 back into my own frame of reference.

6 You know, what we call criticality and we will  
7 continue to call criticality always starts as a super-  
8 criticality issue first and then it becomes critical and  
9 then is achieve some low state.

10 The issue is not whether it's critical or not,  
11 because you could be critical at almost zero power. The  
12 issue is what is the power level at which it continues to  
13 operator, and normally, that's sub-critical, but it could be  
14 sub-critical at a very high power level, will radiate, will  
15 continue to create fission products, will do all of these  
16 things.

17 So, I think it's important that, when we look at  
18 criticality safety, people understand there is a difference  
19 between the word I would call criticality and the word power  
20 level at which it operates.

21 You could be, you know -- and I'm sure you all  
22 have done it -- you could be critical at a very, very tiny  
23 power level, you know, micro-watts, and you can actually  
24 look at it, and it is not a big deal.

25 Now, you can be sub-critical in a power plant or

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1 at a facility, a 3,000-megawatt thermal, and that really  
2 will burn you to a crisp.

3 So, I think it is -- you know, it is this  
4 differentiation that becomes important. It is the ability  
5 to bring the power level to a known hazardous level that is  
6 important.

7 People keep, you know, getting in the issue of  
8 criticality. You look at Tokai-Mura, you know, you will  
9 look at it from criticality followed by a small criticality  
10 pulse which comes from the delay in neutrons coming down,  
11 and then you can see small variations, and it trends down,  
12 and the reason it trends down is because there is not enough  
13 to maintain the criticality.

14 To conclude my statement, at one time I said that  
15 criticality is like humility. Once you believe you've  
16 achieved it, you've just lost it.

17 MR. BRONS: Commissioner, your fun taken well, and  
18 believe me, the team well understands the term criticality.  
19 I think we might be better had we described it in the case  
20 of this accident as an extended super-criticality.

21 COMMISSIONER DIAZ: No, no. It's an extended sub-  
22 criticality.

23 MR. BRONS: But the point I'd like to get to is  
24 that what we were looking for is control, and considerations  
25 for the control of the event, where the hazard by the

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1 radiation emitted was greater than is tolerable and what  
2 methods do you have in place to reduce that hazard to a  
3 controlled and tolerable level, and that's what we're  
4 pursuing.

5 COMMISSIONER DIAZ: All right. Thank you, sir.

6 MR. BERNERO: I would just like to add -- or even  
7 to detect that it is at a power level that is potential  
8 lethal.

9 COMMISSIONER DIAZ: Very important. Thank you,  
10 sir.

11 CHAIRMAN MESERVE: On behalf of the Commission, I  
12 would like again to express my appreciation to this panel  
13 for their work and for their presentation this morning.

14 Our final panel consists of two individuals who  
15 participated in the DOE's work on this same subject, and  
16 they are Tom McLaughlin, who is the Group Leader for Nuclear  
17 Criticality Safety at Los Alamos, and Jerry McKamy, who is a  
18 Nuclear Criticality Safety Specialist, Office of Engineering  
19 Assistance at DOE.

20 Why don't you proceed?

21 MR. LAUGHLIN: If I could please have the first  
22 view-graph, first slide -- and as I look over at your hand-  
23 outs, yours aren't in color. You can see the ones on the  
24 monitor.

25 Perhaps on the next view-graph it will make more  
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1 of a difference, but let me just say that your staff does  
2 have the e-mail file which is -- has the attachment that can  
3 be printed out in color, if it makes significant help in the  
4 future.

5 Just a brief comment on this particular view-  
6 graph.

7 The report that's behind this particular cover is  
8 close to being printed. It's been close to being printed  
9 now for quite a while, and I can only say that it's  
10 unfortunate that it's not out yet, but it is coming, and  
11 it's hopefully coming within the next three weeks.

12 It was ready to be published back in August.

13 We had been working with our Russian colleagues  
14 for the prior several years to get at documented  
15 descriptions of their past accidents that had never been  
16 documented and described and shared with the rest of the  
17 world, and it was at a quadrennial criticality get-together,  
18 international get-together that the French were hosting in  
19 mid-September at which the Russians made a very large  
20 presentation of the information that, indeed, is coming out  
21 in this revised document, not knowing that, one week later,  
22 the Japanese would have an accident.

23 There were many Japanese at this international  
24 get-together, and so, indeed, I was over in England the next  
25 week trying to piggy-back different and sundry trips and

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1 activities, and I was at the Los Alamos equivalent at the  
2 time of the accident, and I will comment on something that  
3 relates to what Commissioner McGaffigan said a minute ago,  
4 namely that, yes, indeed, Tom Cochran put out some good  
5 information that surprised me, too.

6 I have known Tom over the years, and tragically  
7 enough, we get our information from CNN, because whether  
8 it's Japan or any other country, if we don't quickly release  
9 accurate information, the media will improvise.

10 There was no need for the media to have improvised  
11 if the Japanese had shut down their reaction, but they did  
12 not do that as quickly as they could have. That's another  
13 story.

14 On the next view-graph, we just look at briefly  
15 the historical portrayal of the accidents as they have  
16 occurred. There have been 22.

17 We'll say more about the statistics on them, but I  
18 think the interesting feature is that we, the United States,  
19 and Russia both had a significant learning curve, and we  
20 learned.

21 In other words, we both had like one accident a  
22 year for 10 years.

23 Yes, they might have had nearly twice as many as  
24 us, but perhaps statistics on a factor of two really don't  
25 tell us a whole bunch.

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1           But during the mid-'50s to mid-'60s, we both had  
2 like one accident a year for 10 years. I have had many long  
3 conversations with my Russian colleagues, and it's  
4 interesting, the very, very similar situations that we both  
5 encountered in our countries.

6           The one accident in England is at the British  
7 Nuclear Fuels site. That was 1970.

8           Then, of course, the Russians did have a more  
9 recent accident than we have had in 1997, insignificant  
10 consequences to that accident, but still, it did occur, and  
11 very little publicity, too, you might notice, because it was  
12 not much earlier than the Japanese accident, very little  
13 publicity, and then, of course, the Japanese accident.

14           So, in this report and what I am going to share a  
15 few words on a little bit later are, indeed, data and  
16 information that are gleaned from our awareness of 22  
17 accidents, not just one accident, not just the Japanese  
18 accident, and it's interesting and probably not to be  
19 unexpected that the Japanese accident didn't tell us  
20 anything startling new.

21           Yes, it's always a unique event. Any accident  
22 will be. There are always some characteristics that are a  
23 little bit different than the other ones. But indeed, many  
24 of them have very similar out-falls, very similar  
25 consequences, and so, indeed, most of the comments that I

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1 will be making have to do with the pulling together of  
2 information from all 22 accidents.

3 COMMISSIONER DIAZ: Mr. Chairman, the accident in  
4 Argentina -- you don't consider it in here?

5 MR. LAUGHLIN: There are two categories of  
6 criticality accidents. I don't believe that that's in the  
7 packet that is going to come up on the view-graph, but yes,  
8 Commissioner Diaz, as you're well aware, in this report,  
9 there are two parts.

10 In fact, there are three parts, but the first two  
11 parts have to do with the two varieties of criticality  
12 accidents.

13 The first variety is those that occur in process  
14 facilities such as the JCO facility. A second variety are  
15 those that occur in the research reactor and critical  
16 experiment arena, where you intend to get critical, where  
17 that is your goal, and therefore, we do differentiate the  
18 regulation of those.

19 One is reactor safety in this country; one is  
20 criticality safety.

21 That's not necessarily the case in Russia. They  
22 don't differentiate the regulation of them that way.

23 COMMISSIONER DIAZ: Thank you.

24 MR. LAUGHLIN: Yes, sir. So, indeed, Argentina is  
25 described in here.

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1 COMMISSIONER DIAZ: Okay.

2 MR. LAUGHLIN: In the full report.

3 The next view-graph, please.

4 Here, indeed, we just comment on a few of the  
5 statistics of the accidents, 22 total. I'll also bring in  
6 the point that, indeed, almost all of them have been with  
7 solutions.

8 There was one metal, the 1978 accident in Russia  
9 was with metal, and while that's extremely unlikely just  
10 because it's much more difficult to control solutions than  
11 it is to control metals, I think we have benefitted  
12 significantly from the fact that there has been one metal.

13 One, it has helped us to reach people who  
14 previously might have had the mind-set, it just can't  
15 happen. There have been, unfortunately, nine fatalities.  
16 It was seven prior to the Japanese accident.

17 And then this next bullet on exposures, public  
18 exposures -- this was also mentioned by various of the  
19 commissioners at some level, namely that these are not going  
20 to ever be held threatening to the public if we have the  
21 public where they're supposed to be, outside the fence if  
22 you will.

23 These are a worker health and safety issue.

24 We all know -- and I don't want to belittle --  
25 that, indeed, the public can be scared, the public can have

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1 ill health because of concerns, but not from the direct  
2 radiation exposure, and where it says manageable levels only  
3 in one accident, that is, indeed, the most recent accident  
4 in Japan, and that was, in my mind, preventable in the sense  
5 that they could have shut the reaction down much sooner than  
6 they did, but that's the politics of what goes on, not the  
7 technical issues.

8 The environmental contamination, as we have all  
9 understood, was negligible. Tragically enough it wasn't  
10 zero, and therefore, the local farmers could not sell their  
11 produce, and there were lawsuits, and that's understandable.

12 None of the criticality accidents will be  
13 damaging. Commissioner Diaz made this very clear, that the  
14 consequences of a criticality accident are always going to  
15 be benign from that point of view, and I will comment that,  
16 indeed, comments were made about providing reasonable bounds  
17 for these accidents.

18 We have that information. We understand these  
19 accidents enough to appreciate what those reasonable bounds  
20 are.

21 There have been a series of experiments that I'm  
22 sure, Commissioner Diaz, but perhaps others, you are aware  
23 of in the past in this country, the cube experiments in  
24 France, the crack in Silene experiments.

25 They provided us those fission rates and those

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1 first spike yields, etcetera, that we can then use to  
2 extrapolate to our own facilities to understand what  
3 reasonable bounds might be.

4 Let's go on to the next.

5 I have broken down the accidents and distilled the  
6 lessons learned from all of these 22 into three view-graphs;  
7 one is general, and the next two get more into operator  
8 issues and then supervisory and managerial and regulatory  
9 issues, but on this very first view-graph, I do want to  
10 stress that, indeed, there haven't been any accidents  
11 associated with single failures.

12 In other words, it wasn't that we had all of our  
13 eggs in one basket and the basket broke. It has been a  
14 combination that was very difficult, obviously, to have had  
15 the ability to foresee ahead of time, and that has led to  
16 the accident.

17 The second comment has already been made by, I  
18 believe, one of the people prior to me, that, indeed, no  
19 accidents primarily attributable to hardware failure.  
20 Hardware failure might have been associated as a contributor  
21 at a lower level but not even a major contributor to any of  
22 the accidents, and it's been the human element, people  
23 misunderstanding, the people miscommunicating, the people  
24 doing things that maybe they thought they weren't going to  
25 hurt themselves but were knowingly out of bounds that has

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1 led to the accidents.

2 It's the human element that has been associated  
3 with that.

4 On the next view-graph, we will take a look at the  
5 operator-related issues, and while I have phrased these a  
6 little bit differently, more in question form, to the  
7 operator, I think you get the message, namely the operators  
8 truly understanding what might be very obvious to us.

9 In other words, I work routinely with people who  
10 write procedures, I work with process supervisors, I work  
11 with the operators back at Los Alamos, and it's very common  
12 that the operator would interpret a word differently than  
13 the supervisor, might say it's clear what I meant, it's very  
14 obvious.

15 When you look at the thesaurus of the English  
16 language, there are typically 30 or 40 words that might be  
17 associated with any one word, and so, we have to make sure  
18 that not only do we write it to what we think is clear but  
19 then we get feedback and we get confirmation that the  
20 operators understand the words exactly as we meant them.

21 Do we work only according to written procedures?  
22 Several of the past accidents have been associated with  
23 people getting information, for example, over the telephone  
24 from the analytical laboratory on concentrations and  
25 misunderstanding words or passing information from one

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1 operator to the next about please come help me out, I have  
2 to go here, here's where I'm at, you take over, etcetera,  
3 and not having a clear hand-off, and indeed, do the  
4 operators know the consequences?

5         Clearly, all three of these were associated with  
6 Tokai-Mura, again not to be unexpected. These are commons  
7 ones I've distilled.

8         In your handouts, I gave you a much longer listing  
9 of all of the various and sundry causes and lessons learned,  
10 and I say in your handouts, not in the ones that are the  
11 direct replica of what's on the screen here but in the  
12 information that I passed as more background briefing  
13 material that will be in the report in greater detail, but  
14 these are a distillation of some of those larger numbers of  
15 lessons learned and causes, statements.

16         So, indeed, it's important that the operators  
17 understand the consequences, and I think we've all heard --  
18 and it's encouraging -- that, indeed, people don't hesitate  
19 to pull the emergency stop on the train, if you will. They  
20 understand and follow the stop-work policy.

21         So, if we can have the next one, then, we will go  
22 into regulatory issues, we'll go into supervisory and  
23 management issues, and here I guess I might -- and maybe  
24 it's just semantics, but I think I would word it differently  
25 or I would discuss it differently if I was saying, if we had

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1 the right regulations in place maybe in Japan or if they  
2 were doing it like we were doing it, would this accident  
3 have been prevented?

4 Well, perhaps, but I would say, at least at Los  
5 Alamos, if a regulator comes in and more than one time in a  
6 hundred can find something that's truly significant out of  
7 bounds, then yours truly should be fired.

8 If things aren't being done safely that I have  
9 control over, then, indeed, if I am not the first line of  
10 defense and the most important line of defense, nobody is,  
11 but that's perhaps more a philosophical issue -- again,  
12 supervisory, management, regulatory issues.

13 This is -- the first bullet is the major learning  
14 curve from the '50s and '60s.

15 We were working with large process vessels to get  
16 a job done in both countries, and a very -- at least  
17 perceived to be an extremely important job then, of course,  
18 and we relied largely on concentration control and people  
19 not getting out of bounds on that concentration control and  
20 solutions, and indeed, that's not as foolproof as working  
21 with limited-diameter vessels, etcetera, and so, indeed, we  
22 did have a series of accidents there.

23 We have learned that lesson, and to a large  
24 extent, we have written that out of the way we do business.  
25 It will never be perfect.

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1           You don't process low-level waste in two-liter  
2 bottles. You'll never do that economically, and so, at some  
3 point, you must rely on concentration control, but to a  
4 large extent, we've solved that one.

5           Make it easy to do the job right. This was a  
6 classic with the Japanese accident. It was difficult to get  
7 the job done efficiently, effectively, economically  
8 according to the procedure.

9           If you followed the procedure, it was going to  
10 take you a lot longer, it was going to take you a lot more  
11 consternation.

12           It might have been physically a lot more difficult  
13 just to get it done, and indeed, if you're the person who's  
14 in charge or if you're the regulator, when was the last time  
15 that you got out on the floor and observed it, or at least,  
16 if you don't get to the floor very frequently because you're  
17 the regulator, can only show up once every so many months or  
18 so many years, do you at least ask the supervisor when was  
19 the last time you saw the job done properly, of course, and  
20 again, do you know that the operators understand the  
21 consequences, do they understand the concept of criticality?  
22 That was obviously not known in Japan.

23           I believe that's the last view-graph. If there's  
24 another one, I'm going to be surprised.

25           I certainly welcome questions.

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1 CHAIRMAN MESERVE: I'd like to than you for a very  
2 helpful presentation.

3 Why don't we turn to my colleagues and see if they  
4 have questions.

5 Commissioner Merrifield?

6 COMMISSIONER MERRIFIELD: I don't have any  
7 questions. I would say I also appreciate, I think, a very  
8 good presentation and certainly look forward to the report  
9 when it finally comes out.

10 I have one comment I want to make, and it's not  
11 related directly to the presentation you all made, but we  
12 have as an agency and we have as a country a very good  
13 relationship with the Japanese.

14 We have a bilateral arrangement with our Japanese  
15 counterparts; it is one that we've had for some time; it is  
16 one that we have that is very close; and it's one that we  
17 value.

18 We've had a lot of pointed questions today and  
19 we've had concerns that have been raised.

20 For those not familiar with this process, this is  
21 our tendency of doing things.

22 I wouldn't want our Japanese counterparts to take  
23 it in the wrong way. Certainly, it's not intended as a  
24 lecture upon the Japanese nor simply to make them feel as  
25 if, you know, we're the United States NRC and we know

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1 better.

2 I think there's a spirit of really trying to get  
3 to the bottom of this, trying to understand if there are  
4 ways in which we can improve our own process, and for my  
5 part, I believe that there is an open willingness to work  
6 with the Japanese to the extent that we can, to the extent  
7 that they're open to this, to helping them improve their  
8 process.

9 Ultimately our goal -- and we know we share that  
10 with our Japanese counterparts -- is to improve health and  
11 safety, and anything we can do to help them in that regard,  
12 I think we ought to try to do so.

13 Thank you, Mr. Chairman.

14 CHAIRMAN MESERVE: Commissioner Diaz.

15 COMMISSIONER DIAZ: It's a pleasure to see you,  
16 and I'm going to deviate from my normal processes and tell  
17 you that I agree with your presentation, with all your  
18 points, and I want to thank you for it.

19 CHAIRMAN MESERVE: Commissioner McGaffigan.

20 COMMISSIONER McGAFFIGAN: I'm not sure I'm going  
21 to agree with all the points, but let me start.

22 You twice during your presentation criticized the  
23 Japanese for not shutting down the reaction as quickly as  
24 they should have.

25 Could you elaborate more on what your view is that

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1 they should have been able to do during that extended  
2 period?

3 MR. LAUGHLIN: My pleasure. And let me also  
4 support Commissioner Merrifield's comment.

5 We, indeed, have worked closely with our Japanese  
6 colleagues in incorporating the write-up of their accident  
7 into this report.

8 As I mentioned, it was ready to go to press last  
9 August, and then, last September, we had the accident before  
10 we could get it to press, and so, we stopped the press, and  
11 we have, indeed, incorporated the most recent information in  
12 there.

13 I also will say that we had a delegation from  
14 Japan -- and I'm sure they visited you folks -- I want to  
15 say in January.

16 It was a delegation of eight or 10 folks, and a  
17 couple of them -- I say this not to imply anything good,  
18 bad, but a couple of them had military uniforms on and they  
19 were from the defense side of the house, I believe, but it  
20 was a mixed committee, and I addressed them also just  
21 exactly on this issue, because they pointed out that I had  
22 made the comments, and they said, well, what would you do,  
23 and I looked at the gentleman with the military uniform on,  
24 and I said clearly you shut the reaction down by draining  
25 the tank, now surely you could figure a way to do that, and

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1 he smiled and said I understand.

2 This is not high-tech physics.

3 COMMISSIONER McGAFFIGAN: No, I understand, and it  
4 may say something about the Japanese preparedness. My  
5 recollection that day is that there were e-mails coming out  
6 Japan looking for boron injection machines. They were  
7 flailing around for a while trying to figure out what to do,  
8 and it may be that -- but I know boron injection machines is  
9 one of the things that they were looking for that day, and I  
10 think DOE was looking to see if they could help. You  
11 probably were in the middle of it.

12 MR. LAUGHLIN: But you didn't need that. All you  
13 needed to do was drain the tank, and all I can say is, if it  
14 were to happen tomorrow at Los Alamos, I may not get  
15 involved in draining the tank either, because it will be at  
16 a decision higher than me, and it was at a decision much  
17 higher than the local folks, plus I think it was their  
18 mentality to say, well, we have informed our federal  
19 government, now it's up to them to tell us what to do, and  
20 so, it was a political decision.

21 COMMISSIONER McGAFFIGAN: You heard the NEI task  
22 force. You heard our staff pat themselves on the back with  
23 those two view-graphs that showed how different our  
24 regulatory system was from the Japanese regulatory system.  
25 You heard NEI say that the beneficiary in this country of

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1 regulatory controls and standards organizations, and you  
2 sort of down-played that.

3 That may not be surprising coming from DOE where  
4 you self-regulate, but how do you replicate within the DOE  
5 system and how do you maintain over an extended period of  
6 time, in the absence of regulatory controls from the outside  
7 -- you have ES&H and they're represented here, but you don't  
8 have routine inspections, you don't have resident  
9 inspectors, you deal with highly-enriched materials. How  
10 does that work over time?

11 MR. LAUGHLIN: One can say that these accidents  
12 are very infrequent, of course, and all I can say is maybe  
13 one shouldn't get too proud about 42 years without an  
14 accident. They can happen.

15 We had one back in '58 that led to a loss of life,  
16 and there have only been two losses of lives in this type of  
17 accident in this country. So, we're not, clearly, proud of  
18 that, but let me just speak with another hat on.

19 This says Los Alamos National Laboratory. I  
20 happen to be the chairman of a national consensus standard  
21 writing committee, ANS-8.

22 ANS-8 is responsible for the care, feeding,  
23 promulgation, retirement, etcetera, of all criticality-  
24 related standards in this country.

25 The Nuclear Regulatory Commission and the

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1 Department of Energy both subscribe to every single one of  
2 those ANS-8 standards. There are about 16.

3 Again, I am the chairman of that committee. I  
4 have been for about 10 years now.

5 I believe that they are the basis for our track  
6 record in this country, and worldwide. There are a very few  
7 -- there are three right now -- international standards in  
8 criticality safety, but even those three, which have more  
9 recently become international standards, are patterned  
10 directly on the U.S. national standards, because that was  
11 the template. They have come first.

12 And so, the United States has been very advanced-  
13 looked, very advanced-working and -planning in the  
14 regulatory climate, and I think it's a recognition that  
15 these, indeed, if they are followed, can provide for safe,  
16 efficient operations, where I think that your staff, NEI  
17 tend to maybe depart somewhat, and we have the same  
18 departures within the Department of Energy, so it's not that  
19 you're any different than we are in that regard.

20 It's the detailed implementation. We can all  
21 subscribe to the basic standards. The words in there are  
22 very general, they're rather high-level, but they do provide  
23 good common sense guidance.

24 So, we live to the same guidance you do at Los  
25 Alamos versus Nuclear Fuel Services versus Babcock & Wilcox  
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1 or whomever, and we try our very best to implement that in  
2 the spirit of which the words were written, but we live to  
3 the exact same regulations, and I will repeat -- and this  
4 may be something that we can agree to disagree on -- if we  
5 are not implementing those standards as intended and doing  
6 it well, then a regulator coming in infrequently is very  
7 unlikely to keep me away from the accident, very unlikely.  
8 If I rely on regulators coming in, I don't care at what  
9 frequency, or even an in-house regulator, I am derelict.

10 COMMISSIONER MCGAFFIGAN: I agree that you have  
11 the first responsibility. I think that's true for all of  
12 our licensees.

13 I think, at least for some licensees, having an  
14 occasional inspection and having to present for approval  
15 significant changes for license amendments and that sort of  
16 thing and having extra eyes look at it is a useful part of  
17 the process, but that's --

18 MR. LAUGHLIN: And we do that, too, at Los Alamos.

19 COMMISSIONER MCGAFFIGAN: Okay.

20 COMMISSIONER DIAZ: May I just get in here?

21 I think, you know, the existence of the regulatory  
22 framework is indispensable, whether it is the NRC or DOE or  
23 Los Alamos.

24 I have done many criticality experiments at Los  
25 Alamos, with probably the most difficult substance of them  
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1 all, uranium hexafluoride in vapor form, between 93 and 97  
2 percent enriched, and I can attest to the fact that I was,  
3 you know, having to subscribe to very strict procedures of  
4 how to do it and how we will not go critical until we wanted  
5 to, which is the issue of control that the gentleman brought  
6 up.

7           When we wanted to go critical, we, of course, did  
8 not go critical, we went super-critical, because that's the  
9 only way we could know we're going to be around criticality,  
10 but multiple times, you know, the procedures were there, the  
11 controls, you know, calling double-jeopardy, and they were  
12 present, and that was something that I think, you know, we  
13 do very well within, you know, our country, it is the  
14 prevention of criticality.

15           We learn and we do it very well, with very strict  
16 procedures.

17           CHAIRMAN MESERVE: I'd like to ask you a question  
18 that isn't really directed so much at your slides as at  
19 other activities that arose out of the accident at the  
20 Department of Energy.

21           Is it my understanding that you had done an  
22 evaluation of all of your facilities?

23           I'm curious whether there any weaknesses that were  
24 observed at the DOE facilities in this area that have  
25 implications for our sites?

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1 Are there any insights that came from your review  
2 of your array of facilities, of course, which we do not  
3 regulate, that we ought to know about and bear in mind?

4 MR. MCKAMY: We are currently finishing up our  
5 report, which is a summary of the five site reviews that we  
6 did. I'm going to touch on that a little bit. And right  
7 now we're in the process of going over all of the site self-  
8 assessments. So, those results are coming in. So, we  
9 haven't yet looked at them all.

10 Probably, as you've seen from the five site  
11 reports that we have released -- you touched on some things  
12 like operator understanding of the controls and the basis  
13 for the controls.

14 There's nothing new in our reports that you  
15 haven't already touched on. They basically cover some of  
16 the same ground.

17 CHAIRMAN MESERVE: If there are no further  
18 questions, I'd like to thank this panel and the ones that  
19 preceded it for --

20 MR. LAUGHLIN: I apologize. I believe my  
21 colleague here has something that he would like to make as a  
22 presentation, and I think that, because I asked for  
23 questions after my part, that I gave a misimpression there.

24 MR. MCKAMY: I was just going to walk you all  
25 through the department's improvement initiatives that you

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1 just mentioned real quickly, if you have time.

2 CHAIRMAN MESERVE: How long would it take? Can  
3 you keep it to five minutes or so?

4 MR. MCKAMY: I'll keep it to five minutes, yes.

5 Really, what I intended to do was just walk you  
6 through the elements of the improvement initiative and not  
7 go into a lot of the detailed results.

8 The three things that I'd like to discuss here  
9 real briefly are the improvements that we initiated as a  
10 result of the department's implementation plan that was a  
11 response to the Defense Nuclear Facility Safety Board  
12 Recommendation 97-2, and the two features that are important  
13 -- they're all important, but two that are key are the  
14 initiatives to formally train and qualify the criticality  
15 safety analysts around the contractor doing this kind of  
16 analysis.

17 We have a formal qualification plan that we are in  
18 the process of implementing for the contractor criticality  
19 safety analysts, and we also have a formal training  
20 qualification program now in place for the DOE field office  
21 personnel whose job it is to oversee those contractors, and  
22 those are two initiatives that we began in 1997.

23 Another element that's important is that we are  
24 going to require attendance by the Federal staff and a large  
25 percentage of the contractor criticality safety staff an

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1 advanced criticality safety course that we developed at Los  
2 Alamos, and the purpose of that is to give criticality  
3 safety practitioners, the practitioners in the field and  
4 also the regulators, if you will, hands-on knowledge of  
5 critical experiments.

6 Most haven't had such experience in the past, and  
7 so, they can go to Los Alamos, actually perform some  
8 critical experiments in a controlled way, get some hands-on  
9 knowledge and feel for how things go critical, those very  
10 procedures that you talked about, and also, that dovetails  
11 real nicely in the syllabus with actually performing  
12 criticality safety evaluations of a facility at TA-55.

13 So, they get to look at experiments and then do a  
14 real-life application.

15 So, we're going to provide that experience.

16 So, those are two elements we had as a result of  
17 the department's response to 97-2.

18 The second thing I'd like to mention briefly is we  
19 held a department-wide workshop on criticality safety self-  
20 improvement, and the thrust of that workshop was to improve  
21 contractor and DOE self-assessments.

22 We provided detailed lines of inquiry to senior  
23 department managers and senior contractor managers to ANSI  
24 ANS-8.19. It's one of the standards Tom told you about.  
25 It's a mandatory standard in the DOE orders, and it's the

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1 administrative practices standards for criticality safety.  
2 The expectation was to encourage the contractors  
3 to go out and improve their self-assessment methodologies to  
4 cover in detail each one of the elements in the criteria in  
5 a systematic way that are contained in the ANSI 8.19.

6 We also gave out guidance for assessment of the  
7 field office criticality safety programs that were derived  
8 from DOE policy 450.5 -- that's the oversight of line  
9 management, safety oversight policy -- so that the field  
10 programs could assess their ability to do oversight and  
11 criticality safety, and that happened in August of 1999.

12 The final element we also promulgated was  
13 criticality safety performance measures for use by  
14 contractors and local DOE and monitoring improvements in  
15 criticality safety, so that you measure how well you're  
16 doing in crit safety.

17 And finally, the last element was, on November  
18 3rd, the Deputy Secretary issued an initiative that had five  
19 new elements in it, and that's some of the ones you  
20 mentioned.

21 One of the elements was a high-level screening  
22 review of five key facilities. Again, those five reports  
23 are out.

24 We're currently reviewing the summary results from  
25 those reviews, and those should be released this month, and

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1 those five facilities were DOE Y12 plant, the Los Alamos PF-  
2 4 area and TA-55, Hanford, HB Line, and Outside Canyons, and  
3 we also looked at Hanford PFP, and we looked at Rocky Flats  
4 Building 371, and those areas were primarily selected  
5 because they were the ones involved with fissile solution  
6 processing, and those typically have the higher risks of  
7 criticality accidents. So, that's one initiative.

8 Another initiative was to direct all of the sites  
9 to do detailed self-assessments according to the criteria we  
10 issued at the workshop, meaning walk through every one of  
11 the ANSI 8.19 criteria using the lines of inquiry that we  
12 promulgated there and to develop the corrective action plans  
13 for any weaknesses that they have and then provide those to  
14 headquarters for review.

15 Also, the sites were all directed to develop  
16 performance metrics for criticality safety and provide those  
17 to headquarters.

18 The fourth task was to do a headquarters review of  
19 those corrective actions and those self-assessments and then  
20 to write a final report to the Secretary later this year,  
21 and then the final task was to look at relocation of TA-55,  
22 which is the critical experiments facility, where our  
23 advanced training course goes on, as well as other missions  
24 to support national security and nuclear safety.

25 So, those are the department's criticality safety

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1 improvement initiatives, or at least major elements.

2 CHAIRMAN MESERVE: Thank you very much.

3 I'd like to suggest that, as you have various of  
4 the products that you've described completed, whether you  
5 could make sure that you send them to our staff so we can  
6 gain the benefit of all the work that you've done.

7 MR. McKAMY: You bet.

8 CHAIRMAN MESERVE: With that, I'd like to thank  
9 this panel and --

10 COMMISSIONER McGAFFIGAN: Mr. Chairman, I could  
11 ask one question? His presentation provoked a thought.  
12 This really goes to Mr. Laughlin.

13 The DNFSB 97-2 report he's just reminded me of was  
14 quite critical, especially of the loss of knowledge about  
15 criticality issues within the department. How did you get  
16 in that state? I mean there is a regulator. It's maybe not  
17 the NRC, but there is a regulator who is pointing out what  
18 was a significant weakness.

19 MR. LAUGHLIN: There are perhaps a multitude of  
20 reasons.

21 COMMISSIONER McGAFFIGAN: You have to give the 30-  
22 second version.

23 MR. LAUGHLIN: More managerial, perhaps, that  
24 anything else.

25 You are seeing turnover of the corporate logo at

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1 many sites on a year or two-year basis. There is a desire  
2 to get a contract award fee and then leave, in my mind.

3 We are seeing many things that are associated with  
4 lack of stability in who is in charge of that entity, and  
5 therefore, they are saying, well, we'll hire the criticality  
6 staff, we'll hire the people to do the job, but if you don't  
7 know the skeletons in the closet, you're at a significant  
8 disadvantage.

9 You need people who are interested in staying  
10 there for the long haul, and we have lost that, to a large  
11 degree, within the department, and it's very undesirable,  
12 but it's a fact.

13 COMMISSIONER MCGAFFIGAN: Thank you.

14 CHAIRMAN MESERVE: Let me just say on that point  
15 that I participated in a  
16 National Academy of Sciences study in 1986 where we pointed  
17 out to the department that they were losing their  
18 criticality expertise and that they ought to do something  
19 about it, and they haven't.

20 Okay.

21 I'd like to thank you very much.

22 I also would like to echo some comments that  
23 Commissioner Merrifield made that we do have very important  
24 relations with the Japanese. They are relations that are  
25 ones that are of great benefit to our agency, and there were

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1 lots of rather blunt and direct comments that were made  
2 today. That was not intended to be critical, it was not  
3 intending to be piling on, it was really to make sure that  
4 we have a candid appraisal of the situation, and we all  
5 benefit from that.

6 With that, we're adjourned.

7 [Whereupon, at 12:26 p.m., the briefing was  
8 concluded.]

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