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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

SAFETY CULTURE PUBLIC MEETING AND HEARING

AUGUST 27, 2014

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

625 INDIANA AVENUE

ROOM 352

WASHINGTON, D.C. 20004

Before: LINDA D. METCALF, CER, REPORTER

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Defense Nuclear Facilities Safety Board

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1 P R O C E E D I N G S  
2 - - - - -

3 DR. WINOKUR: Good morning. My name is Peter  
4 Winokur, and I am the Chairman of the Defense Nuclear  
5 Facilities Safety Board. I'll preside over this public  
6 meeting and hearing.

7 I would like to introduce my colleagues on the  
8 Safety Board. To my immediate right is Ms. Jessie  
9 Roberson. Ms. Jessie Roberson is the Board's Vice  
10 Chairman. To my immediate left is Sean Sullivan. We  
11 three constitute the Board.

12 Mr. John Batherson, representing the Board's  
13 Office of the General Counsel, is seated to my far left.  
14 Mr. Steven Stokes, the Board's Technical Director, is  
15 seated to my far right.

16 Several members of the Board's staff closely  
17 involved with the Safety Culture Oversight at the  
18 Department of Energy's defense nuclear facilities are  
19 also here.

20 Today's meeting and hearing was publicly noticed  
21 in the Federal Register on August 14th, 2014. The  
22 meeting and hearing are held open to the public per the  
23 provisions of the Government in the Sunshine Act. In  
24 order to provide timely and accurate information  
25 concerning the Board's public and worker health and

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1 safety mission throughout the Department of Energy's  
2 defense nuclear complex, the Board is recording this  
3 proceeding through a verbatim transcript, video  
4 recording and live video streaming.

5 The transcript, associated documents, public  
6 notice and video recording will be available for viewing  
7 in the public reading room here at our headquarters in  
8 Washington, D.C. In addition, an archive copy of the  
9 video recording will be available through our website  
10 for at least 60 days.

11 Per the Board's practice, and as stated in the  
12 Federal Register Notice, we will welcome comments from  
13 interested members of the public at the conclusion of  
14 testimony, which will be at approximately 11:30 a.m.  
15 following this morning's session, and 4:00 p.m.  
16 following this afternoon's session.

17 A list of those speakers who have contacted the  
18 Board is posted at the entrance to this room. We have  
19 generally listed the speakers in the order in which they  
20 have contacted us, or if possible, when they wish to  
21 speak.

22 I will call the speakers in this order and ask  
23 that speakers state their name and title at the  
24 beginning of their presentation. There is also a table  
25 at the entrance to this room with a sign-up sheet for

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1 members of the public who wish to make a presentation  
2 but did not have an opportunity to notify us ahead of  
3 time. They will follow those who have already  
4 registered with us in the order in which they have  
5 signed up.

6 To give everyone wishing to make a presentation  
7 an equal opportunity, we ask speakers to limit their  
8 original presentations to five minutes. I will then  
9 give consideration for additional comments, should time  
10 permit.

11 Presentations should be limited to comments,  
12 technical information or data concerning the subject of  
13 this public meeting and hearing. The Board members may  
14 question anyone making a presentation to the extent  
15 deemed appropriate. The record of this proceeding will  
16 remain open until September 27, 2014.

17 I would like to reiterate that the Board  
18 reserves its right to further schedule or regulate the  
19 course of this meeting and hearing, to recess,  
20 reconvene, postpone or adjourn this meeting and hearing  
21 and to otherwise exercise its authority under the Atomic  
22 Energy Act of 1954 as amended.

23 This public meeting and hearing is the second of  
24 a series of hearings the Board will convene to address  
25 safety culture at Department of Energy Defense Nuclear

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1 Facilities and to address the Board's Recommendation  
2 2011-1, Safety Culture at the Waste Treatment and  
3 Immobilization Plant. Later hearings will be announced  
4 by separate notices.

5 In this hearing, the Board will hold two  
6 sessions. In this morning's session, the Board will  
7 receive testimony from current and former Navy officers  
8 where they focus on safety practices and tools that the  
9 Navy uses to improve and sustain a robust culture of  
10 safety, both in operations and in the design and  
11 construction of nuclear submarines.

12 The Board will also explore the applicability of  
13 the Navy's safety practices and tools to other  
14 organizations such as the National Aeronomics and Space  
15 Administration, and the Department of Energy.

16 In the afternoon session, the Board will hear  
17 testimony from a panel composed of a member of the  
18 United States Chemical, Safety and Hazard Investigation  
19 Board and two experts in human organizational factors  
20 and management of high reliability organizations. This  
21 panel will discuss the role of the organizational  
22 leaders in establishing and sustaining a robust culture  
23 of safety within organizations conducting complex and  
24 high hazard operations.

25 In a follow-on session later this fall, we will

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1 discuss with officials from the Department of Energy how  
2 these approaches and lessons learned might be used to  
3 guide their efforts in continuing to assess and improve  
4 safety culture at the Department of Energy's defense  
5 nuclear facilities.

6 This concludes my opening remarks. I will now  
7 turn to the Board members for their opening remarks.  
8 Ms. Roberson?

9 MS. ROBERSON: None at this time, Mr. Chairman.

10 DR. WINOKUR: Mr. Sullivan?

11 MR. SULLIVAN: Yes, briefly. Mic not on? Okay,  
12 I'm not technical here. Okay. I am technical.

13 Yes, good morning. The first of these hearings  
14 we had seemed to focus to me a lot on assessments of  
15 safety culture, which I wasn't particularly interested  
16 in, quite frankly, so my participation was limited, and  
17 I said then I thought safety culture was mostly about  
18 leadership, and so today's focus seems to me to be a lot  
19 on leadership, so I will be quite interested in that,  
20 and I do not intend to limit my participation, and I  
21 look forward to the testimony that we will receive.

22 I'm still not exactly clear how as an oversight  
23 organization we will use that information to try to  
24 apply it to the Department of Energy, but nevertheless,  
25 I'll be very interested in the information that we do

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1 receive. Thank you.

2 DR. WINOKUR: Thank you, Mr. Sullivan. This  
3 concludes the Board's opening remarks. At this time I  
4 would like to invite our two Navy officers to the  
5 witness table. Each officer will be provided 30 minutes  
6 to make a presentation that addresses some initial lines  
7 of inquiry provided by the Board in advance of this  
8 hearing.

9 The Board will then question each witness.  
10 Gentlemen, please.

11 Our first witness is Rear Admiral Kenneth J.  
12 Norton. Admiral Norton has been the commander of the  
13 Navy Safety Center since January 2013. The Navy Safety  
14 Center reports to the Chief of Naval Operations, and its  
15 mission is to prevent mishaps, to save lives and to  
16 preserve resources by providing advice, policies,  
17 services and risk management information and tools that  
18 enhance command structure, combat readiness and global  
19 warfighting capabilities.

20 The Navy Safety Center addresses the safety of  
21 essentially all aspects of Navy Operations, whether  
22 afloat, ashore, in aviation or occupational in nature.  
23 Among his previous command tours, Admiral Norton  
24 commanded the nuclear powered aircraft carrier, the USS  
25 Ronald Reagan, and was the executive officer of the

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1 nuclear powered aircraft carrier USS Carl Vinson.

2 Under his command, the USS Ronald Reagan was  
3 awarded the 2008 and 2009 battle effectiveness award, as  
4 well as the 2009 Chief of Naval Operations Afloat Safety  
5 Award.

6 Admiral Norton also has accumulated over 4,500  
7 hours in rotary wing aircraft and has nine overseas  
8 deployments.

9 Admiral Norton will speak to the Navy's efforts  
10 to monitor, improve and sustain a robust culture of  
11 safety within its wide range of operations, and speak to  
12 the role that the Navy Safety Center provides in  
13 supporting those efforts.

14 Our second witness is Rear Admiral Thomas  
15 Eccles, who retired from the Navy in 2013. At the time  
16 of his retirement, Admiral Eccles was the chief engineer  
17 and deputy commander for Naval Systems Engineering in  
18 the Navy Sea Systems Command. During previous  
19 assignments, Admiral Eccles was the Seawolf program  
20 manager for the USS Jimmy Carter, and he was the program  
21 manager for advanced undersea systems.

22 Admiral Eccles has also served onboard two  
23 nuclear submarines and is a qualified deep sea diver and  
24 salvage officer. In 2010, Admiral Eccles was appointed  
25 to the National Academy of Engineering Committee

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1 examining the Deepwater Horizon explosion and fire and  
2 the subsequent oil spill in the Gulf of Mexico. He also  
3 led the U.S. technical team in a joint international  
4 investigation with the Republic of Korea on the loss of  
5 the warship Cheonan. I hope I pronounced that  
6 correctly.

7 He is a fellow of the Society of Naval  
8 Architects and Marine Engineers, and was the recipient  
9 of the 2012 Gold Medal of the American Society of Naval  
10 Engineers. One of the programs that many organizations  
11 view as the benchmark for excellence for ensuring the  
12 safety of the nation's submarine fleet is the Navy's  
13 SUBSAFE program. As the Navy's chief engineer, Admiral  
14 Eccles played a key role in that program.

15 In this session, we've asked the Admiral to  
16 discuss the SUBSAFE program and how it is used to create  
17 a culture of safety within the Navy's submarine forces  
18 and those responsible for designing and constructing  
19 submarines.

20 Let me add that I, for one, am appreciative of  
21 the willingness of Admiral Norton and Admiral Eccles to  
22 testify today on a topic that I think is vitally  
23 important to this nation. I believe there is a great  
24 deal that can be learned from each of the panel members  
25 about how to manage and improve safety culture at DOE's

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1 Defense Nuclear Facilities.

2 I look forward to these presentations and  
3 discussions. We will begin the presentations with  
4 Admiral Norton. Welcome, Admiral.

5 REAR ADMIRAL NORTON: Thank you, Dr. Winokur,  
6 and Mr. Sullivan, Ms. Roberson and everybody else on the  
7 panel there. Welcome for those out in the audience.

8 As said, I was honored to be asked to come up  
9 here and testify concerning the Naval Safety Center. I  
10 want to emphasize the word naval there meaning United  
11 States Navy and the United States Marine Corps, so we  
12 actually work in both services there.

13 This is the agenda that I have today. I'm going  
14 to talk a little bit about the background information  
15 from the command, our safety practices and procedures,  
16 tools, metrics and current initiatives and the way  
17 ahead, because the one thing we found about when you  
18 apply safety best practices, you can't stand still.  
19 There's always innovation going on. There's always ways  
20 to improve to make sure that you have a strong safety  
21 culture.

22 This is the background. Back in 1951, for most  
23 of us that can remember back there, and certainly those  
24 that were into the '60s, we were having just a  
25 horrendous safety record when it came to aviation, so we

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1 stood up the Naval Aviation Safety Activity with a group  
2 of about 30 folks and tried to get out this mishap rate  
3 that was going on in naval flight activities. And as  
4 we've progressed through the years, we've added more and  
5 more what I would call exacting procedures and  
6 techniques to the organization.

7 In 1992 we included the United States Marine  
8 Corps. We added the Navy Safety Environmental Training  
9 Center back in 2003. We became the operational risk  
10 management model manager in 2010, and then just last  
11 year, I assumed the responsibility to take control of  
12 the Naval School of Aviation Safety.

13 This is what Secretary Mabus has to say on  
14 safety. This was his vision statement, and it still  
15 holds true today. His goal for the department is to  
16 become the best military safety organization in the  
17 world. Investments in safety have shown great payback.  
18 We must aggressively fund safety research, implement  
19 proven safety technology. Mishaps, hazards, near-miss  
20 events, must be quickly identified, analyzed and openly  
21 communicated so that those lessons learned will prevent  
22 reoccurrence.

23 And then the Department of Navy objectives for  
24 this past year: Maintain war fighter readiness, safety  
25 will continue to be a focus as the Department strives to

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1 reduce accidents and mishaps. So that's what Secretary  
2 Mabus has to say about safety. This is our ETHOS.

3 The mission at the Naval Safety Center: Prevent  
4 mishaps, save lives, preserve resources. The advice,  
5 policy services and risk management information and the  
6 tools that the Naval Safety Center provides enhance  
7 command culture, combat readiness and global warfighting  
8 capabilities. Let me just repeat that: enhances  
9 command culture, combat readiness and global warfighting  
10 capabilities. That's the mission.

11 This is basically the Venn diagram showing where  
12 I am at the Naval Safety Center. You can see all the  
13 folks there, but I just want to kind of outline here in  
14 the lower left, we have about 100 military persons  
15 onboard, we have about 100 civilians, you can see  
16 including 21 Marines, and then we have the schools, et  
17 cetera, but I just wanted to show you our command and  
18 control structure there.

19 This is the environmental school. What's  
20 important to note there is we conduct 458 classes at 74  
21 worldwide locations. We do a lot of global online  
22 classes. We have close to 9,200 students a year that  
23 are graduating from those classes.

24 Down at the school of Naval Aviation Safety,  
25 which is in Pensacola, Florida, you can see that also we

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1 put the throughput there, the customers include the  
2 Navy, Marine Corps, Coast Guard. We have foreign  
3 students, the Naval Postgraduate School, flight schools,  
4 allied nations and other agencies, including the  
5 Department of Homeland Security.

6 This is our safety culture. This is from Mr.  
7 Ron McKinnon, Changing the Workplace Safety Culture, and  
8 this is what I think the Department of Defense,  
9 certainly the Department of Energy are trying to get at,  
10 an organization safety personality, and here's that  
11 word, leadership, and Mr. Sullivan mentioned that.

12 Leadership has to commit to the integrating the  
13 practices of safety in the culture of the organization.  
14 All day, all night, it's a 24/7 way of looking at the  
15 way we conduct our work.

16 Leadership and safety culture, from McKinnon:  
17 "Management's Commitment in Involvement in Leadership,"  
18 and that's the key. Many of us talk about leadership or  
19 management by walking about. When I was the captain  
20 over the USS Ronald Reagan or as the executive officer  
21 of the Carl Vinson, that was a lot of my daytime was  
22 considered walking about.

23 I didn't trap myself up in the pilot house, I  
24 had people up there who know how to drive the ship, so I  
25 would walk around through the ship, as big as it is,

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1 through all the different levels, through the propulsion  
2 plant area, on up to the fo'c'sle hole, wherever it  
3 happened to be. See what people are doing, talking to  
4 my sailors and making sure that I had an exacting eye to  
5 make sure that things were being done, but they were  
6 being done safely.

7 Any attempt to change or improve the safety  
8 culture at any workplace will fail if there is not total  
9 commitment by leadership. So that, I think, is key  
10 right there.

11 Military: Here's some of our challenges that  
12 we've found in the Department of the Navy. We have this  
13 can-do and we have this high-risk mentality. Think of  
14 the young men and women that we are recruiting to come  
15 into the military, especially coming into the Marines or  
16 coming into the Navy. These are people who are  
17 generally involved with some of the X Games type of  
18 affairs. They like to go out on their off-duty hours.  
19 They like to take risks, whether it's snowboarding or  
20 bungee jumping, whatever it happens to be, and we want  
21 those men and women in our service.

22 Do more with less mindset. Well, I don't have  
23 to remind anybody here that we all went under  
24 sequestration last year. We had a hiring freeze. We  
25 had less O&M, which is the operational management and

1 operational funds, and yet nowhere was there a reduction  
2 in the demand signal for our services, so we were asked  
3 to do more with less, and the reality is we were trying  
4 to make sure that we could answer the combatant  
5 commander's requirements, but we had less training hours  
6 to do it, to prepare our forces, and in some cases we  
7 had less manpower to put at the problems.

8 We have distinctly different subcultures in the  
9 United States Navy and the Marine Corps. I know that  
10 sounds kind of unusual, but we have aviation, we have  
11 submarine forces, and we have the afloat forces, the  
12 surface warfare officers and the surface warfare  
13 sailors. So, they had varying approaches to hazard  
14 management and reporting.

15 When I came into the job a year and a half ago,  
16 I decided I was going to homogenize all the best  
17 practices through all what we call our tribes:  
18 Aviation, submarine forces, surface forces, and then our  
19 Navy expeditionary forces, including divers.

20 Part of trying to meld these different  
21 communities or cultures together was the fear of  
22 reporting. Many times people would fear that if they  
23 had a near miss, it would be like a bad mark on like a  
24 report card to their higher reporting seniors.

25 The concept of privilege of information versus

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1 need-to-know in web-enabled safety system shortfalls, so  
2 we couldn't necessarily share all the near misses that  
3 we had out there. So, these were some of the challenges  
4 I had when I came into the job.

5 Here are some of the leadership examples right  
6 now. We have two Echelon II commanders that are fully  
7 onboard with making sure we operationalize safety. We  
8 have Admiral Harris, who is the commander of the Pacific  
9 Fleet. He came through the Naval Safety Center en route  
10 to taking over the job. This was his brief when he took  
11 over the job: Professional execution, safety, it  
12 underpins all we do, and also at Fleet Forces Command,  
13 Admiral Gortney, basically you see right there the lines  
14 of operation that he has: Warfighting, sailors,  
15 partnerships, management and operations. Underpins all  
16 that is safety.

17 Bottom line, we have the leadership driving the  
18 organizational climate. The organizational climate  
19 drives the long-term cultural change.

20 Human Factors: This is what we're trying to  
21 tackle. Seventy-five percent of the mishaps have human  
22 factors. You can call that human error as a causal  
23 factor. So we, at down to the unit level -- and when I  
24 talk to the unit level, I mean squadrons, I mean ships,  
25 including submarines. They need to understand and

1 acknowledge that people at the sharp end are not usually  
2 the instigator of the incidents, but are more likely to  
3 inherit bad situations that have been developing over a  
4 long period, and Admiral Reason made that comment back  
5 in 1997.

6 So let's talk about practices, procedures, tools  
7 and metrics. This is how we're getting at it. This is  
8 what the Naval Safety Center does annually. We go out  
9 and conduct between 350 and 400 safety surveys at the  
10 unit level. I'll repeat myself. The unit level is at  
11 the squadron level, the ship level or the submarine.

12 Unfortunately, we also have to send our  
13 investigators out in the field or out in a float  
14 situation to help conduct the mishap investigations. We  
15 do assist visits, engagements. I consider this an  
16 engagement, obviously. We do cultural workshops where  
17 we go in and we talk to the command, and we view their  
18 culture, their command climate and view their current  
19 culture.

20 Now, let me just pause here a second to talk a  
21 little bit about the way that I view culture and  
22 climate. Climate is you talk to a sailor and you ask  
23 him does he like being there, and I'll give you a great  
24 example. We had a ship, the USS Cowpens. The sailors  
25 loved being there, and that was the climate. The

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1 sailors loved being there. Why? Because the culture  
2 was so poor, they didn't have to do zone inspections.  
3 They didn't have to do what's called 3M, a preventative  
4 maintenance program.

5 The commanding officer of that ship decided that  
6 he wasn't going to enforce those preventative programs.  
7 They had no safety program onboard. So the climate was  
8 the sailors loved it. When they were done with their  
9 watches, they could go back to their berthing areas,  
10 play video games, et cetera.

11 But the climate was very, very poor, so what  
12 eventually happened was that -- and it was in the news a  
13 couple, three weeks ago. That commanding officer was  
14 eventually relieved for cause, all right? So that's how  
15 important we view to have the culture right. When you  
16 have the climate right, sailors want to be there, and  
17 the culture right, that's when you have your great  
18 ships.

19 We also put out some media things in four  
20 magazines, the schoolhouses we talked about, and the 200  
21 personnel that are working day in and day out to prevent  
22 mishaps, save our resources and save lives.

23 Safety survey, it's not an inspection. We're  
24 kind of way ahead. We go in and we look at how a  
25 command is operating, and we look to see if safety

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1 underpins everything they do. We adjust our focus for  
2 the problem areas. We'll do basically mentoring and  
3 tutoring while we're there, and we do a comprehensive  
4 debrief to the commanding officer, the executive  
5 officer, and the senior enlisted advisor, normally the  
6 command master chief or the chief of the boat. It helps  
7 the units achieve and maintain more fighting readiness  
8 via the on-spot training and advice.

9 Typical Year: 106 units, 30 discrepancies per  
10 survey. It seems like a lot. Most of those are pretty  
11 minor. A lot of them have to do with things like having  
12 personal electronic equipment safety checked, so when  
13 someone brings aboard that video game or perhaps  
14 something that they have, their computer that they want  
15 to be able to recharge the batteries, et cetera, we make  
16 sure that those things get safety checked so when  
17 they're plugging it into the system onboard the ship,  
18 that it's safe to operate.

19 We publish the results. We aggregate the top 10  
20 survey results through all these similar units, and we  
21 put that out, so they have safety system working groups  
22 to address those.

23 Cultural Workshop: We rely heavily on the  
24 United States Navy Reservists for this. Candid  
25 meetings, small groups. It allows the commanding

1 officers to identify the human factors and concerns  
2 before they become problems. Once again, we look at the  
3 culture, and we look at the climate.

4 The Department of Defense human factors analysis  
5 and classification system. When we have to go out and  
6 review everything from what we call class A mishaps,  
7 which is any sort of mishap that is \$2 million or more,  
8 all the way down to hazardous reports. Hazardous  
9 reports can -- would be called, let's say, a near miss  
10 or maybe something below the cost of about \$50,000. We  
11 go out there and see, using human factors, what it was  
12 that was caused. We don't want to know what happened,  
13 we want to know why it happened, and that's the key  
14 right there.

15 Down at the Naval School of Aviation Safety, one  
16 of the things we have in every aviation unit is a safety  
17 officer. He goes through a rigorous school, so he can  
18 be at the squadron. His primary duty is to run all the  
19 safety programs there. This is something that is  
20 migrating to the surface and subsurface communities, and  
21 I'll talk about that a little bit later.

22 Strengthening the Culture. The aviation safety  
23 command course required for every prospective commanding  
24 officer, and I might add that I go up to Newport, Rhode  
25 Island to talk to all the prospective commanding

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1 officers for the surface forces. I also go to Groton,  
2 Connecticut, to talk to all the prospective commanding  
3 officers for submarines, emphasizing safety and the  
4 safety programs that they will be required to  
5 administer.

6 Concept of Privilege. Once again, we want to  
7 have an open forum where people are willing and able to  
8 come forward. Nothing is worse than having a situation  
9 where a commanding officer is in a pilot house and is  
10 about ready to do something with his ship, and there's  
11 people on the pilot house who are assisting him in the  
12 operations of the ship, and they don't have the courage  
13 to ask that they don't understand or they feel  
14 uncomfortable because the command climate is such that  
15 they're afraid that the commanding officer won't listen  
16 to their specific concerns.

17 So we talk about that, and we talk about a  
18 culture that allows that most junior sailor who is at  
19 helm or lee helm to be able to say I don't understand or  
20 I don't know or I'm uncomfortable.

21 Strengthening the Culture. We have safety  
22 stand-downs quarterly. We have an anymouse program.  
23 It's an anymouse, anonymous. A person can say, you  
24 know, I saw the commander write a note, put it in the  
25 anymouse box, the safety officer, the aviation safety

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1 officer and the command gets it, and it will say, I saw  
2 the executive officer manning up an aircraft today, his  
3 sleeves were rolled up, he didn't have his visor down,  
4 he didn't have his chin strap on his helmet snapped, and  
5 yet he expects all of us on the flightline to have our  
6 sleeves rolled down, our goggles on, and our helmets  
7 snapped, those type of things.

8 And so it gets at it to make sure that everyone  
9 has an opportunity when they see an unsafe condition, if  
10 they feel uncomfortable coming forward with it, they do  
11 have a venue to report it.

12 And these are some of the other things we have  
13 at the unit level, aviation safety council, enlisted  
14 safety council, ORM stands for operational risk  
15 management, we'll talk about that a little bit later.  
16 HAZREPS, as we talked about, those are presents. Those  
17 are near misses. We have a critique. What nearly  
18 happened? It could have been catastrophic, if we dodged  
19 a bullet, whatever it happens to be, and we'll talk  
20 about those things to prevent those from happening  
21 again.

22 Assessing Safety Culture. This is where we come  
23 in as a group, and we have the United States Marine  
24 Corps helping us out there for ground climate assessment  
25 as well. We talk about the lead-in about this, but we

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1 do the data analysis to identify trends and leading  
2 indicators. What we want to try and do is get left of  
3 the kill chain. We don't -- if the mishap is the kill,  
4 we want to get to the left of that. We want to prevent  
5 the things that would lead us up to that point where we  
6 have a mishap.

7 This is how we assess the Naval aviation safety  
8 culture. This is how we assess the command climate.  
9 Well, the takeaways there -- excuse me, team debriefs.  
10 Every time you go flying, every time you go about  
11 executing a flight schedule, you plan. It seems very,  
12 very simple. You plan the event, you brief the event,  
13 you execute the event, and probably the most important  
14 thing is you debrief the event, and you talk as a flight  
15 crew, and you talk to maintenance control, and you say,  
16 this is how we planned it. This is what we planned to  
17 do. This is during the brief. This is what was  
18 executed, and when we got done with the execution, did  
19 we accomplish what we set out to do?

20 And that, I think, is one of the -- it seems so  
21 simple, but so often people don't do the debrief part,  
22 and I think that's where you get your lessons learned,  
23 that's where you can pass along some of the most  
24 critical information to make sure that things didn't go  
25 quite right or quite as expected that you would be able

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1 to plan for that the next time you are in a similar  
2 situation.

3 Afloat Community. I talked about the tribes,  
4 the different cultures. This is what's going on with  
5 surface, submarine and diving communities. This is  
6 where we're going with it, where they're going to start  
7 putting a full-time safety officer with safety training  
8 and operational expertise. We're taking that from the  
9 aviation sort of blueprint, and we're putting that in  
10 the afloat community.

11 We're going to have a process existing for  
12 people to come forward and, without retribution, be able  
13 to say, you know, the bless me Father for I have sinned,  
14 this is what occurred, it didn't go right, we tried to  
15 cut a corner, and we ended up putting ourselves in  
16 extremis, and because of that, we're here today to talk  
17 about that.

18 Current initiatives are the way ahead, and this  
19 is what I am very, very excited about. We just  
20 initiated the Safety Campaign Plan. This was my  
21 commander's intent. You can see at U.S. Pacific Fleet  
22 and Fleet Forces Command as well. Our desired end  
23 straight, a proactive, predictive risk management  
24 culture exists fleetwide that operates a comprehensive  
25 safety management system. Our model has the four

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1 components, which is safety policy, which I'm  
2 responsible for; safety risk management, I'm also the  
3 model manager for operational risk management; safety  
4 assurance; and then safety promotion.

5 We are going to formalize into all lines of  
6 operations, integrated at all chain of command levels,  
7 all the way down to the unit level, all the way down to  
8 the single sailor, all the way down to the single  
9 Marine.

10 Preventable Mishaps are Eliminated. That is our  
11 goal. There is a safety management system model. You  
12 can see safety promotion basically is the outer ring.  
13 Policy, safety assurance evaluates the continued  
14 effectiveness of implemented risk control strategies.

15 By the way, we didn't develop this, we stole  
16 this from the FAA, from the Federal Aviation  
17 Administration. This is one of those things, though,  
18 that the Secretary of Defense said all services will go  
19 to this model, and this is why we have jumped on this  
20 waiting to be told in 2015, we decided to implement it  
21 early.

22 Safety Risk Management. Determines the need for  
23 and the adequacy of new or revised risk controls based  
24 on the assessment of acceptable risk. You cannot  
25 eliminate all risk. Let's be frank, this is the

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1 Department of Defense, but you can mitigate risk that  
2 perhaps to a tolerable level so you can execute mission.

3 We have a saying in the Department of Defense  
4 and the Department of Navy, operational necessity.  
5 Well, quite frankly, even as a one-star admiral or a  
6 two-star Admiral as the Carrier Strike Group Commander,  
7 you don't have the authority to invoke Operational  
8 Necessity. It has to be done much higher in the Chain  
9 of Command. What operational necessity means  
10 essentially is that the risk to crew outweighs risk to  
11 mission.

12 In other words, risk -- I have to get the  
13 mission complete, and so I'm willing to put the crew,  
14 the ship, that air crew, that aircraft, into harm's way  
15 in order for mission accomplishment. That really rarely  
16 gets invoked.

17 We have implied operational necessity, and  
18 that's where we get in trouble for folks to believe that  
19 the mission has to be done at all costs, when, in fact,  
20 if the aircraft isn't ready to be launched or the ship  
21 doesn't have the weapon system working at full mission  
22 capability, perhaps we have to pause and tell our Chain  
23 of Command, it's time to come back and do it another  
24 day, but right now, as you know, we've been winding down  
25 from two long wars, and we tend to see in the Fleet that

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1 there's this implied operational necessity being applied  
2 out in the Fleet.

3 That's operationalizing safety culture. This is  
4 where we're at today. The safety outboard has been  
5 released. The objectives and tasks are being worked on  
6 right now. We essentially gave the entire Fleet an  
7 operational order, and this is to implement the Safety  
8 Management System through the Safety Campaign Plan for  
9 us to do best practices, which include putting safety  
10 officers at all our operational units.

11 The campaign, plan way ahead, we'll start seeing  
12 the frag, that's the fragmentary orders, so these are  
13 spinoffs from the operational orders. We'll publish the  
14 Joint U.S. Fleet Forces, U.S. Pacific Fleet Safety  
15 Management System Instruction, and I've got folks there,  
16 we're building that instruction now, to develop and  
17 refine Mature Safety Analytics, and we do that via  
18 software programs.

19 Bottom Line. Our Navy safety culture is strong,  
20 but continues to evolve and improve, campaign plans,  
21 surveys, workshops. Getting back to what Mr. Sullivan  
22 said, effective leadership in a healthy command  
23 organizational climate set the stage for a strong safety  
24 culture.

25 I can't emphasize this, this is the foot

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1 stomper. Senior Leadership is critical. Establishing  
2 the culture cannot be the safety officer's job. It's  
3 the Commanding Officer's job. It's the Executive  
4 Officer's job. It's the Senior Enlisted Advisor's job.  
5 It's the Admiral's job. You can see our Chief of Naval  
6 Operations said as recently as a couple of years ago,  
7 Safety Programs do not replace leadership, they are the  
8 tools for the leaders. We need the foundation of proper  
9 practices to ensure the safety of our military and the  
10 Department of Navy civilian personnel.

11 So, I know I kind of blew through that kind of  
12 quick, but I wanted to give time for questions and  
13 answers, and so with that, I'll open the floor.

14 DR. WINOKUR: Thank you, Admiral Norton, for  
15 your very excellent and insightful presentation, and the  
16 Board would like to follow up that information with some  
17 questions. We have a series of questions for you, but I  
18 want to be flexible on this panel. I know that we have  
19 Admiral Eccles with us, so if there is some additional  
20 insight or information you would like to provide during  
21 the questioning, we will have plenty of questions for  
22 you later, but if during Admiral Norton's questions you  
23 want to chime in, please just seek the recognition of  
24 the Chair, I'll be happy to do that.

25 And I think with that, the questions will begin

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1 with Vice Chairman Roberson.

2 MS. ROBERSON: Good morning, and thank you for  
3 your comments.

4 REAR ADMIRAL NORTON: Yes, ma'am.

5 MS. ROBERSON: I enjoyed it greatly. So, just a  
6 few questions, recognize we are looking for what we can  
7 gain from your experience and your activities to help us  
8 in our interactions with the Department of Energy in  
9 this area.

10 So, questions that may seem a foregone  
11 conclusion, I am going to ask anyway, just because I'd  
12 like for you to elaborate a bit.

13 So, the Navy Safety Center performs, I'm going  
14 to call them white hat surveys, because I like that  
15 term, I think it's very good, to provide the different  
16 platforms with non-mandatory safety evaluations.

17 And how do they use that information to inform  
18 and improve their own culture?

19 REAR ADMIRAL NORTON: What they will see and  
20 what my team will do in the field is they will look at a  
21 program, and let's say if something is -- something you  
22 may not consider, but we have a motorcycles riders  
23 safety program, and they will see that, let's say a  
24 unit -- let's call it a squadron, had a couple of  
25 motorcycle mishaps, not fatalities necessarily, but

1 mishaps. So we'll say, you know, we've seen other  
2 squadrons or other ships that have a mentorship program,  
3 and they have experienced riders here at the command  
4 that'll take some of these beginner riders, and they  
5 will do weekend rides together or things like that, so  
6 we'll share with them what we have seen as best  
7 practices.

8           When it comes to motorcycle ridership, for  
9 instance, we have a basic ridership safety course and a  
10 more advanced course that we provide at no charge, and  
11 all the services do this, by the way, to our young men  
12 and women who want to ride motorcycles.

13           That's great, but we found out from talking with  
14 the insurance companies of the United States that really  
15 the only thing that makes a motorcycle rider safe is  
16 experience. So, that's why we grab the mentorship of  
17 other riders, perhaps in the command or a sister  
18 squadron, or a sister ship, and have them develop a  
19 rider club, let's say, where they can go out on a  
20 Saturday, not during rush hour traffic, and do a ride  
21 and show them some of the safe best practices. And we  
22 apply that also at the deck level or up at the tarmac or  
23 launch and recovery of an aircraft or whatever it  
24 happens to be.

25           MS. ROBERSON: And I assume, I was especially

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1 interested in your comments about how determinations  
2 were made about the command climate, and the fact that  
3 you do have different subcultures on the different  
4 platforms, and I'm sure the aviation is viewed as an  
5 entirely different animal from the divers or submarine.

6 REAR ADMIRAL NORTON: Yeah, and what we're  
7 trying to do, of course, is kind of homogenize that, but  
8 when we go in to do a cultural workshop or assess a  
9 command climate, we'll actually put together small  
10 groups based on demographic, and it's usually based on  
11 rank, you know, because you've got a Navy Commander or  
12 perhaps a Captain in a major command who may believe  
13 that his culture is one way, but when you start talking  
14 to the young Sailors or Marines, kind of the ones who  
15 are doing the heavy lifting, and you ask them what they  
16 believe the culture is, you will find them perhaps  
17 having a different perspective than what the commanding  
18 officer might have.

19 And then we're able to -- and it's not  
20 attribution, and it's usually anonymous inputs, and so  
21 the people feel good about being, I think, truthful, and  
22 they'll say, you know, we're working 12-hour shifts, and  
23 it's tough, seven days a week when you're under way, and  
24 we'll hear things like that. So the Commanding Officer  
25 needs to sort of be sensitive to that.

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1           Sometimes if you're off the coast of Pakistan or  
2 something like that, it may require that type of hard  
3 work or something like that, but the commanding officer  
4 needs to be aware of that, needs to be aware of the  
5 fatigue factor, and be able then maybe to talk to their  
6 Admiral in their Strike Group or whoever it happens to  
7 be and say, hey, you know, I'd like to have a day just  
8 for captain's day where I can have everyone take a knee  
9 over here and have a day off, and we can do that while  
10 we're under way usually off in the Middle East or in the  
11 South China Sea or something like that.

12           MS. ROBERSON: You know, the training obviously  
13 is always an important element of reinforcing and  
14 improving changing and processes and procedures, and I  
15 know you've touched on this in your presentation, but I  
16 did want you to just comment a little bit more about the  
17 sufficiency of training and changes to processes and  
18 procedures as it compares to leadership.

19           REAR ADMIRAL NORTON: Well, that's kind of  
20 what's nice about being the model manager for a couple  
21 of the training programs when it comes to safety is it  
22 evolves over time, and as whether it's software programs  
23 or other tools that are out there, for instance for  
24 myself in aviation, the safety of flight at night became  
25 what I would say incredibly better with the introduction

1 of night vision goggles, and flying at night no longer  
2 was primarily just on instruments. And, so, we see  
3 technology being added to all the training and software  
4 programs that make, hopefully, jobs easier and whether  
5 it's for navigation or whether it's monitoring systems  
6 in a propulsion plant where sailors would have to  
7 normally go with a clipboard and a pencil and a sheet of  
8 paper and read gauges, now we have software programs  
9 that do it.

10 So, the training itself has evolved over time,  
11 with the emphasis for the sailors and the Marines that  
12 whatever training we give you to apply to the weapon  
13 system that you work with, that you understand there's a  
14 certain integrity involved, and in that integrity  
15 includes watch standing principles, not the least of  
16 which is verbatim compliance with the procedures that  
17 have been developed to operate that weapons system.

18 MS. ROBERSON: Okay. Would you like to take a  
19 break?

20 DR. WINOKUR: Let me follow up with a couple of  
21 questions. I saw that you put a definition from James  
22 Reason, you said Admiral Reason actually, up on the  
23 chart of safety culture. Does the Navy have its own  
24 definition of safety culture, a formal definition of  
25 safety culture? Does the Navy feel there's a need to

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1 have a formal definition of safety culture?

2 REAR ADMIRAL NORTON: No. It's sort of like we  
3 look at industry, you know. I've read a lot about --  
4 since I had the chance to be at the Safety Center, we  
5 looked at, for instance, what was going on in Alcoa,  
6 what has gone on down in Houston, places like Phillips  
7 and BP, and we have looked at their best practices and  
8 applied those as well.

9 But I'll tell you, Doctor, it all comes down to  
10 leadership. It's the willingness of leadership to  
11 invest in that safety program or that safety -- what I  
12 want to say is safety culture because I don't think  
13 safety is a program, I think it's a culture. It  
14 underpins everything we do. And that's why for a  
15 definition, is it's difficult sometimes to say, well,  
16 this is our own definition.

17 Now, it's one that's broadly, I think, hugged or  
18 wrapped around by many different industries or many  
19 different services as well. When I read the safety  
20 culture definition by the United States Air Force and  
21 the United States Army, it's very, very similar to ours,  
22 you know, saving lives and preserving resources.

23 DR. WINOKUR: I think there's a lot of reasons  
24 why we should talk to you today, and I'm sure that there  
25 are ways that the Board can improve and understand

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1 oversight of the Department of Energy, and the  
2 Department of Energy can improve, and hopefully we'll  
3 get to that, but I was really interested when you talked  
4 about operational necessity and what that concept meant  
5 because the Board, the Defense Nuclear Facilities Safety  
6 Board, is an oversight organization because the people  
7 in Congress didn't want the Board to have the power to  
8 tell the Secretary of Energy, who has this awesome  
9 responsibility for assuring the nation's nuclear  
10 deterrent, when he or she could and couldn't do  
11 something. But it is a very, very burdensome, very,  
12 very important power that we have. And we constantly  
13 look to the Department of Energy to see when and if  
14 they're ever going to implement that idea and say that,  
15 yes, safety is important, but we have a mission here  
16 that needs to be performed irregardless, and to be  
17 frank, in my years on the Board, we haven't seen that  
18 yet, and in today's climate that hasn't happened.

19 But just an example of some of the similarities  
20 between the concepts that you deal with and the concepts  
21 that we see.

22 I wanted to follow up on another question. You  
23 talked about the fact that the way people see things,  
24 whether they're an Admiral, maybe an officer seeing a  
25 leader, and whether you're on the flight deck can be a

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1 little bit different, and we often see surveys where we  
2 see a marked difference in terms of how people view  
3 things at different levels of the organization. First  
4 of all, what do you think attributes to those  
5 perceptions?

6 REAR ADMIRAL NORTON: Well, you know I think as  
7 leaders, and maybe I'm putting this in military speak,  
8 so if I need to explain myself, you know we as leaders  
9 kind of work at the strategic level, and so you know we  
10 kind of have -- the term we use in the Navy is kind of  
11 the wave, the top of the waves kind of, the wave top  
12 view of how things are going. Whereas sort of your  
13 rank-and-file sailor or Marine who's in charge of maybe  
14 some mundane job sees things at the tactical level, you  
15 know, kind of the day-to-day operations that contribute  
16 to mission effectiveness.

17 And, so, you know at the strategic level, we're  
18 seeing that, well, there hasn't been any mishaps, or  
19 major mishaps, hardly anyone is not executing to the  
20 point where the mission accomplishment is being  
21 compromised, so everything must be going along pretty  
22 well.

23 Well, when you go back down to the Sailor or the  
24 Marine at what we call the deck plate level, we will  
25 find that maybe they're tired. They're perhaps using

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1 shortcuts in order to meet the demand signal, and then  
2 you find that they have an extremely different view than  
3 what the leadership has.

4 In order for the leadership to understand that,  
5 they have to get down to maintenance control, or they  
6 have to get down there in the hangars and have the  
7 opportunity to talk to the individuals who are actually  
8 the ones who are tired or feel that the demand signal is  
9 so strong that they have to compromise or cut corners in  
10 order to meet the demand. Those type of things.

11 DR. WINOKUR: Yeah, when I look at the  
12 definition of safety culture that the nuclear industry  
13 uses or DOE uses, we talk about the role of the  
14 leadership, which you've already emphasized how  
15 important it is, but in the end, it's the attitudes and  
16 the values of the workers, so in your case it could be  
17 the attitudes and the values of the Sailors.

18 Do you see their views as the actual final  
19 measure of whether or not you've established the culture  
20 of safety you're looking for? Are they the final -- and  
21 based upon their behaviors and attitudes, is that the  
22 final measure of whether you're being successful in what  
23 you're trying to do?

24 REAR ADMIRAL NORTON: Well, that's a part of it,  
25 but I think it has to be systemic, from leadership,

1 front office, all the way down to the deck level where  
2 everyone feels they're sort of part of mission  
3 accomplishment, but they're doing it in accordance with  
4 published operational instructions, maintenance  
5 instructions, that they have the tools, they have the  
6 equipment, they have the manning, and they have the  
7 funding in order for them to get it done.

8           You know, part of what we look at is the  
9 training, manning and equipping of the units, and what  
10 we find out is if they're not manned to the required  
11 level or they don't have the required equipment, that's  
12 where we see people trying to meet the demand signal  
13 because it's still there, but they can't do it  
14 effectively, and so they will tend to try to cut  
15 corners.

16           So, rather than throttling back on the demand  
17 signal, and that's where it takes the courage of the  
18 commanding officer of the unit to be able to go up his  
19 chain of command and say, we can't do everything you're  
20 asking for right now because we don't have the training,  
21 manning and equipment that is required right now to do  
22 all these things.

23           DR. WINOKUR: And maybe one final question: How  
24 do you work on those perceptions at the different  
25 levels? I mean, how do you actually in the end get down

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1 to where you need to be in terms of what you're looking  
2 for in the culture?

3 REAR ADMIRAL NORTON: Well, I'll go back, not to  
4 my current job, but back to when I was the Commander in  
5 one of my squadrons, and I was at the commander pay  
6 grade, but I was the Executive Officer. In the Navy  
7 what we do is you go in as the Executive Officer, and  
8 you're there for about a year and a half, and then you  
9 fleet -- what we call fleet up to be the Commanding  
10 Officer.

11 I had a commanding officer at the time, so I was  
12 second in command of the squadron, where we had a  
13 sailor, a young sailor, that I was getting ready to go  
14 fly, and I was already strapped into the aircraft, the  
15 co-pilot was in, the crew were in the back. We were  
16 starting up the engines, and this -- they call him plane  
17 captain, you know, fresh out of boot camp. He gave me  
18 the cut sign on the rotor system, and I shut her down,  
19 and he said, Sir, I see an oil leak, and he goes, And my  
20 recommendation is that you not go fly, that we down this  
21 aircraft.

22 And sure enough, I unstrapped, and I climbed up  
23 on the aircraft and saw that a quick disconnect fitting  
24 had backed off, and we had a little bit of an oil spill.  
25 That commanding officer at the next all-hands or

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1 quarters we call them brought that sailor up, and he  
2 didn't know it, brought the sailor up out of the ranks  
3 and presented him with a Navy Achievement Medal for  
4 essentially having the courage to basically down an  
5 aircraft that the executive officer was going to go fly.

6 That's how you establish a safety culture, you  
7 know, a carrot and stick. I've seen other commands  
8 where people have taken shortcuts, whether it was for  
9 malicious or laziness or shoddy work or whatever it is,  
10 that they've gone to -- under the UCMJ, they have gone  
11 to mast, captain's mast, non-judicial punishment, and  
12 been held accountable for not complying with established  
13 procedures as well.

14 So, I have seen that, and that's kind of the  
15 stick approach as well. So, when you have kind of the  
16 reward when obviously it is deserved, but also to hold  
17 people accountable when it is deserved as well, I  
18 believe that's how you kind of get from the whole  
19 spectrum of people understanding that safety is critical  
20 and important in this command.

21 DR. WINOKUR: Thank you. I mean, the Department  
22 of Energy has its work force, also, has stop work  
23 authority because they, like you, deal with very  
24 complex, high hazard nuclear operations, and the  
25 department, I think, acknowledges the fact that workers

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1 in the field, more than anybody, knows what's going on,  
2 and they have to have those kinds of authorities, so I  
3 think it's healthy they do that.

4 REAR ADMIRAL NORTON: Yeah, and I think it has  
5 to be without fear of reprisal, and it might be a lack  
6 of knowledge. Somebody says, you know, I see something,  
7 and I thought -- just because I'm uncomfortable or I  
8 believe it's unsafe, until someone explains to them  
9 saying, no, you know, this is actually normal, normal  
10 operations, here it is in chapter and verse, it says  
11 it's okay for this to have that rating or for it to  
12 operate that way, yeah.

13 DR. WINOKUR: Thank you.

14 Mr. Sullivan?

15 MR. SULLIVAN: Thank you, and good morning,  
16 Admiral, and thank you for being here, and I know that  
17 you have a very important job and a lot to do, and I  
18 really thank you for taking time out of your busy day to  
19 come here and help us.

20 REAR ADMIRAL NORTON: Yes, sir.

21 MR. SULLIVAN: I want to ask you about the  
22 relationship between technical competence and  
23 leadership, especially as it applies to safety and being  
24 able to make the right decisions in safety. I was  
25 particularly struck by your background because you're a

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1 helicopter pilot, and yet you were put in command of an  
2 aircraft carrier, it's a ship, had a nuclear power  
3 plant. Well, it does launch helos. Most of the  
4 aircraft were jets, so you didn't grow up flying jets,  
5 you didn't grow up operating nuclear power plants, you  
6 didn't grow up -- when I say grow up, in your time as a  
7 junior officer in the Navy, driving ships.

8 REAR ADMIRAL NORTON: Right.

9 MR. SULLIVAN: Yet you got in charge of all of  
10 that. So, I would like you to talk about, well, what  
11 preparations did the Navy give you for that role, did  
12 you feel technically competent in that job? I'm sure  
13 you did, but I would like you to talk about how you  
14 acquire -- how you felt you acquired the right level of  
15 knowledge to make the right decisions and how that  
16 impacted in your ability to maintain safe operations.

17 REAR ADMIRAL NORTON: Thanks. I'll get a chance  
18 to maybe wax poetic here a little bit about my  
19 background. I started out in aviation, went through the  
20 helo pipeline, and there's a rigorous flight training,  
21 including a flight manual that we call NATOPS for  
22 standardization and training, operational training  
23 standardization is what NATOPS stands for.

24 In order to make aircraft commander, you  
25 essentially had to have the technical expertise that you

1 could draw and speak competently and critically and  
2 technically on all of the systems onboard the aircraft.  
3 So, when it came to emergency procedures when you're in  
4 flight -- and keep in mind that in a helicopter, unlike  
5 most of our fixed-wing aircraft, if you launch in a  
6 helicopter, you're going to land. There is no such  
7 thing as a ejection seat. There is no parachutes that  
8 you are going to be able to count on should things go  
9 really, really bad.

10 So, in order to make aircraft commander, you  
11 study all those systems, and then you have a board, and  
12 it's very critical, and you get to that point, and then  
13 you're essentially given the keys to fly that aircraft  
14 in all the mission areas. And usually you achieve that  
15 during your first tour, operational tour out in the  
16 fleet.

17 So, I did that, and as time went on, with more  
18 experience and more mission areas and competency, I was  
19 able to become the model manager for the type model  
20 series of the aircraft I was flying at the time, which  
21 was the Seahawk.

22 After my command tour, I got selected into the  
23 Nuclear Propulsion Program because they looked at my  
24 undergraduate background as well as the success I had in  
25 my command tour and felt that I could get through the

1 training, the technical part of the nuclear propulsion  
2 curriculum.

3           So, I did that. I went down to Charleston,  
4 South Carolina, where we had what I call our ground  
5 school, and I went through the basics of the nuclear  
6 propulsion, went to prototype then, after I got done  
7 with that part of the training, up to Ballston Spa in  
8 upstate New York, and worked in a propulsion plant up  
9 there, the SAG for the folks here that know that program  
10 or submarine system, and was able to really do the  
11 hands-on part of the nuclear propulsion application, the  
12 lab work, let's say, everything from chemistry to  
13 scrambling the reactor to doing in-plant emergency  
14 response drills, all the things that you would do.

15           From there, I went down to the Navy Yard where  
16 Naval Reactors is located, and then started working  
17 specifically on the plant for the Nimitz-class carrier,  
18 and keep in mind on the Nimitz-class carrier, there is  
19 actually two propulsion plants, the A4W. Went through  
20 the curriculum there, went through a pretty intense oral  
21 board and written exam, and then eventually was allowed  
22 and got certified to operate as a nuclear operator for  
23 that particular plant, and that's when I showed up as  
24 the XO of the USS Carl Vinson.

25           The requirement to stay in the propulsion plant,

1 whether you're the executive officer or whether you're  
2 commanding officer, is driven by Naval Reactors, and so  
3 you're down there and you're participating in the  
4 training, you participate in the drills, you participate  
5 in maintenance, mostly monitoring maintenance that is  
6 going on. You watch the operations of the plant, and  
7 you do this on a recurring basis throughout your tour,  
8 and you continue to do this training, whether you're  
9 actually under way or whether you're in a maintenance  
10 phase, and that kind of keeps you sort of in the game.

11           There is always an operational reactor safeguard  
12 exam coming around the corner, you have to be prepared  
13 to do that, you do multiple prep work to get your  
14 propulsion plant team ready for the reactor safeguards  
15 exams by doing mobile training team at sea periods, and  
16 so it goes.

17           I remember as a commanding officer, I was  
18 writing a letter every month to the four-star admiral,  
19 in that case -- right now it's Admiral Richardson, but  
20 back in those days it was Admiral Donald, and I would be  
21 telling him as a commanding officer not only all the  
22 training that my propulsion plant sailors were doing,  
23 but also what I did to participate in there and the  
24 training that I gave and the lectures that I'd also  
25 give, et cetera, and the run time you would do and the

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1 boards that I sat on to get people qualified, et cetera.

2 So, the technical expertise is part of the  
3 environment. It starts with that integrity and verbatim  
4 compliance and forceful watch backup, all those pillars  
5 of proper watch standing.

6 For Mr. Sullivan, who is obviously aware of the  
7 propulsion plant exams, the USS Ronald Reagan, while I  
8 was there, and I attribute this mostly to my reactor  
9 officer, we got an excellent on our ORSE, so the first  
10 excellent in over seven years for an aircraft carrier,  
11 so that's kind of where the Ronald Reagan was sitting at  
12 that time.

13 MR. SULLIVAN: Well, thank you for that,  
14 Admiral. So, just as a follow-up, just imagine a  
15 scenario, since you didn't have to live through one,  
16 imagine a scenario where somebody was in the leadership  
17 position who didn't have the technical background. Do  
18 you think that would have an impact on the ability to  
19 make the right decisions for safety or provide the right  
20 safety culture?

21 REAR ADMIRAL NORTON: I've only been in  
22 leadership positions where I've had the technical  
23 expertise to apply to making decisions when it came to  
24 propulsion plants or aircraft maintenance, et cetera. I  
25 would feel, me personally, very uncomfortable if I

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1 didn't have that technical baseline and I was asked to  
2 make a decision affecting safety, affecting safety of  
3 the people around me and my own safety, if I didn't  
4 understand the technology that was applied towards it.

5 MR. SULLIVAN: Okay. Thank you. I think that's  
6 a very fair answer.

7 Mr. Chairman?

8 DR. WINOKUR: Thank you, Mr. Sullivan. Let me  
9 talk to you a little bit about metrics and assessment.  
10 You have a new U.S. Navy Fleet Safety Campaign Plan that  
11 was signed out on the 25th of June, and in it it  
12 requires a safety assessment mechanism that is metrics  
13 based and measurable, and I think you've already pointed  
14 out that you can't manage what you can't measure, right?

15 REAR ADMIRAL NORTON: Right.

16 DR. WINOKUR: So, tell me a little bit about,  
17 from your perspective, about metrics. I mean, you're  
18 the head of this center, are there metrics on your desk  
19 every morning when you come in to work, things that  
20 you're looking at to give you a sense of how things are  
21 going?

22 REAR ADMIRAL NORTON: It's not a daily report,  
23 but we have a weekly report where we're seeing -- we  
24 compare to where we are today, and we do -- we call it,  
25 for lack of a better term, we do sort of seasonal

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1 campaigns, like right now we're in what we call the  
2 critical days of summer, you know, because this is a  
3 time where most of our sailors, Marines, do a lot of  
4 off-duty, high-risk recreational activities, and so we  
5 want to make sure that they apply risk management to  
6 that.

7           And, so, we will see what they're doing out  
8 there in the Fleet, and whether it's waterborne or  
9 whether it's climbing cliffs or bungee jumping or  
10 whatever it happens to be, but we compare those mishaps  
11 or people getting hurt, and we get the reports in that  
12 compare to other years, and I think we're having an  
13 effect because we see compared to 10, 12 years ago, our  
14 rates, our mishap rates are going down. So, it shows me  
15 that people are applying sort of risk management to not  
16 only what they do operationally when they have their  
17 uniforms on, but perhaps when they're going out the main  
18 gate and they're looking for some recreation, whether it  
19 be riding dirt bikes or water skiing or whatever it  
20 happens to be. So, I'm very, very pleased with that.

21           We have other things, tools for our sailors and  
22 Marines to use. One is a lot of people do a lot of  
23 driving in the summer, obviously for time off, vacation  
24 time. We have a program that assesses the risk of them  
25 being on the road compared to like how much rest they

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1 had the night before, the driving conditions, the length  
2 of the drive, all those things, and the name of the  
3 program is called TRiPS, of all things.

4 And at the end of it, you assess your trip, and  
5 it says, yeah, it's low risk. But usually in the  
6 commands at the unit level, a sailor will have to take  
7 that up their chain of command, usually to their chief  
8 petty officer or one of their sergeants, and they will  
9 have to say, see, this is the trip I'm taking this long  
10 weekend, Labor Day weekend coming up, I'm driving 500  
11 miles, but rather than going straight through, I'm only  
12 driving 250 miles and stopping at the Motel 6 and  
13 getting some more rest and continuing on the next  
14 morning, or something like that, to get approved at that  
15 level.

16 So, you know, the last thing we need is a sailor  
17 driving home from a three-day weekend trying to make  
18 roll call on Monday or Tuesday morning and driving  
19 through the night and fatigued, and he ends up having a  
20 mishap.

21 DR. WINOKUR: But you've got these surveys and  
22 assessments, which I want to talk a little bit more  
23 about, and you have a new campaign plan to get these  
24 metrics-based metrics and having them measurable. Do  
25 you think you will be putting more effort into that in

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1 the future, or do you think you have what you need right  
2 now?

3 REAR ADMIRAL NORTON: We have an adequate system  
4 right now, what's called a Web-enabled Safety System,  
5 where the users put in the data and then our analysis  
6 can extract that data to make comments based on mishap  
7 rates or perhaps in particular like a geographical area.

8 For instance, there was a spike this year in the  
9 San Diego area for both sailors and Marines for  
10 motorcycle mishaps, for whatever reason. And, well, it  
11 turned out that a lot more people are buying motorcycles  
12 because the cost of a gallon of gas in Southern  
13 California is over \$4 a gallon, and they were using it  
14 to commute, and especially in the fall through the  
15 winter and the spring, it's dark. And we were able then  
16 to talk to the units out there and say, hey, do you  
17 understand when you expect sailors to be in at 6:30 in  
18 the morning so they can muster at 7:00, they're driving  
19 their motorcycles in the dark, and that's a higher risk  
20 environment.

21 If you, perhaps, shifted your hours and they  
22 didn't have to muster until 8:00, well then they could  
23 ride to work in daylight. And, so, you can just do  
24 things like that for them. So that's one of the ways we  
25 approached it.

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1 DR. WINOKUR: So, you do assessments. Do you  
2 have any regimen about when you do follow-up  
3 assessments, or are follow-up assessments basically  
4 driven by what you find the first time you look?

5 REAR ADMIRAL NORTON: We do -- the surveys, for  
6 instance, are on a recurring basis. Units, float units,  
7 are once every two years, and the aviation units are  
8 once every three years, but what we're going to get to  
9 is we have the Operational Fleet Response Plan, which is  
10 a 36-month cycle, and one of the things we want to do  
11 for our assessment, you can walk down the peer, walk  
12 onboard a ship when it's doubled up, which means the  
13 lines are crossed, and the ship's not really  
14 operationally tasked. And you can look at their  
15 programs, but if you really want to get an idea of the  
16 safety culture, it's better to see a ship when it's  
17 under way and it's doing operations.

18 And then you can see whether they apply best  
19 tactics, procedures, operational risk management when  
20 there are sort of this fog and friction of war kind of  
21 thing going on out there, watch them during a sea and  
22 anchor detail, watch them when the ship is doing an  
23 under way replenishment.

24 So, we're going to start doing our surveys at a  
25 specific time in this Operational Fleet Response Plan,

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1 so we get them about the intermediate phase of work-up,  
2 as the crew comes together, as the ships come together  
3 as a strike group, and so we can assess better the  
4 safety culture on those ships.

5 DR. WINOKUR: How important do you think  
6 independent assessments are? I'm sure the folks who run  
7 the ships do their own internal assessments to get ready  
8 for some external Navy group to come in and look at  
9 them, but is that enough, or do you really need an  
10 independent assessment, an independent set of eyes to  
11 come in and look at their version?

12 REAR ADMIRAL NORTON: I think you do. I think  
13 you do, Doctor, and I'll tell you why. We have the  
14 ability to see trends across the Fleet, but also we see  
15 what I would call best practices or worst practices, and  
16 when we go from, let's say from one destroyer to the  
17 next destroyer to the next destroyer, we can talk about  
18 similar programs, and we can pass on to a commanding  
19 officer or an entire command, you know, we think this  
20 works, we've seen it work over here, a sister ship, I  
21 think it could be applied here, it would be better for  
22 your safety culture if perhaps you applied this as well.

23 And that's, I think, part of the reason we can  
24 be honest brokers. And like I say, we're kind of white  
25 hats, we can go in and tell a Commanding Officer that he

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1 may feel he has a strong safety culture, and we can go  
2 in and say, well, compared to your sister ships, you're  
3 kind of right in the middle. That type of thing.

4 DR. WINOKUR: Makes sense to me. You talked  
5 about the fact that even though you're very busy, you  
6 actually go down and you walk around and you see things  
7 for yourself.

8 REAR ADMIRAL NORTON: Oh, yeah, right.

9 DR. WINOKUR: I've heard people express the  
10 opinion to me that a leader should really, just by that,  
11 understand what's going on, that surveys and assessments  
12 are nice, but pretty much you should be able to figure  
13 it out for yourself.

14 REAR ADMIRAL NORTON: I think sometimes the  
15 surveys and the assessments sort of reaffirm what you  
16 think you know, and I think those leaders that get down  
17 and talk to their team members, whether it's on the deck  
18 plates or wherever it happens to be on their ship or in  
19 their squadron, it can be reaffirming. So, you can kind  
20 of get the, well, I'm going to keep doing what I'm doing  
21 kind of thing, and that's also a real positive.

22 DR. WINOKUR: All right. Thank you very much,  
23 Admiral.

24 Ms. Roberson?

25 MS. ROBERSON: Thank you, Mr. Chairman.

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1           Just a couple of finishing questions. When you  
2 do your investigations and your surveys, you're looking  
3 at contract organizations that are a part of the whole  
4 program, right?

5           REAR ADMIRAL NORTON: Um-hmm.

6           MS. ROBERSON: How do you, in looking at the  
7 data from the surveys and investigations, do you see or  
8 have you identified trends that provide more helping  
9 influence in the behavior of, say, the contractors?  
10 Have their culture of safety in aligning that?

11           REAR ADMIRAL NORTON: Yeah. It's kind of a --  
12 we don't have a whole lot of what I would call core  
13 responsibility to what contractors do. When I put my  
14 ship, the USS Ronald Reagan, into maintenance  
15 availability and we had contractors onboard, I had a  
16 ship supervisor sort of that worked with me as the  
17 captain of the ship that kind of handled the  
18 contractors. However, when I walked around and I saw  
19 contractors that were doing things and they weren't, for  
20 instance, wearing their personal protection equipment or  
21 they would have a harness on but they wouldn't, like,  
22 have a lanyard and they went out on scaffolding and they  
23 wouldn't basically snap in, those type of things.

24           I've been accused of having an Irish temper a  
25 little bit, and it's usually when things are unsafe that

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1 sort of it kind of riles me a little bit. And it was to  
2 the point where I had the ship supervisor ask a  
3 subcontractor not to come back because they failed to  
4 comply with the safety requirements during that  
5 maintenance availability.

6 Well, because it got to that point and the  
7 subcontractor obviously asked for forgiveness, et  
8 cetera, and ended up having a couple of their employees  
9 no longer come back to the ship, but they were able to  
10 continue on with their contract. But I set the safety  
11 center. We don't really have direct oversight to that.  
12 I believe NAVSEA and NAVAIR have more of that when it  
13 comes to ship construction, et cetera.

14 MS. ROBERSON: Okay.

15 REAR ADMIRAL NORTON: But we don't have as much.

16 MS. ROBERSON: Okay. I'll ask that question  
17 again later. And I had one final question for you: You  
18 emphasized a lot in your briefing that, my words, not  
19 yours, safety really is an enabler for the mission, and  
20 I believe that. I think the entire Board and the  
21 Department of Energy believes that, but we also know  
22 there's no 100 percent safety assurance, and there are  
23 mission essentials.

24 So, can you just speak for a moment about the  
25 balance in safety and mission and its relationship to

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1 accountability?

2 REAR ADMIRAL NORTON: Sure. There's a sign over  
3 my door down in my office down in Norfolk that says "Our  
4 aim is zero."

5 I don't believe, personally, that we should have  
6 an approach towards safety that says, we're going to cut  
7 our mishap rate in half, because if you're saying that  
8 you're going to cut a rate in half, you're essentially  
9 sending a signal that some mishaps are okay to have.

10 There are some things that you can't get around.  
11 I had a situation early in my flight career in a  
12 helicopter that I talked about, that if you are going to  
13 launch, you are going to land. I had to do a water  
14 landing in a helicopter because I lost my tail rotor  
15 drive shaft, and it was metal fatigued at the quick  
16 disconnect.

17 So, you're going to have mishaps due to  
18 mechanical failure, and there is -- that's difficult to  
19 prevent, though we have put programs in place now to  
20 monitor, for instance, vibrations on aircraft, et  
21 cetera, and look at metal fatigue and say, hey, after so  
22 many hours we're going to replace certain components,  
23 dynamic components, because at this point it appears  
24 that the risk of failure increases.

25 So, you can put programs like that in place, and

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1 hopefully not have those type of mishaps.

2 Mission accomplishment. Well, that is what we  
3 are paid to do when it comes to supporting this  
4 Administration or any administration in our national  
5 security objectives. As I said earlier though,  
6 operational necessity is something that, quite frankly,  
7 those decisions are made here in this city and not  
8 necessarily out there. Where we have to be careful is  
9 that we don't interpret orders that we receive from the  
10 Pentagon or from the Oval Office that are anything other  
11 than -- or interpreted anything other than operational  
12 necessity.

13 So, I guess what I'm saying is, don't imply  
14 operational necessity down the chain of command when  
15 it's really not there.

16 MS. ROBERSON: Thank you, very much.

17 REAR ADMIRAL NORTON: Yes.

18 DR. WINOKUR: Thank you. We are holding these  
19 hearings obviously to learn things from you about what  
20 might be applicable to the Department of Energy, and we  
21 know that the Navy and the Department of Energy have  
22 different cultures, but the Navy is often called upon  
23 when the nation has a tragedy or there's any kind of a  
24 problem to provide its insights on safety.

25 I think many people recognize the Navy as having

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1 a strong safety record, a strong culture of safety, so I  
2 want to try to probe a little bit and understand what  
3 about your culture of safety could be applicable to the  
4 Department of Energy, could be something they could  
5 benefit from, and I want to start out the discussion by  
6 pointing out that in 2000 I think there was a Navy/NASA  
7 interaction.

8 What had happened is NASA had just lost the  
9 Space Shuttle Challenger, and this interaction began  
10 because the Administrator of NASA wrote a letter to the  
11 head of the Department of the Navy, Mr. England, and  
12 said, can you help us, can you give us some insight. Do  
13 you have any information on that interaction, how well  
14 it worked or didn't work?

15 REAR ADMIRAL NORTON: Well, yeah, it actually  
16 works pretty well, and I've been down to the Johnson  
17 Space Center. I'm part of their Safety Investigation  
18 Board for NASA. And they used the Air Force as well,  
19 but they liked our approach to not only safety, but the  
20 way we use the HAZREP, hazardous reporting system.

21 We don't wait for mishaps to occur in order for  
22 us to make changes. We try to be anticipatory, and try  
23 and get at sort of what I would call the low-hanging  
24 fruit, the small things that could -- if they are left  
25 to sort of develop over time, could, in fact, lead to a

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1 catastrophic mishap.

2           They also like the way we do our investigations  
3 are separate from sort of the legal aspects. For  
4 general counsel there, as you're probably aware, we do  
5 JAG investigations for mishaps, but we also do a safety  
6 investigation, and they're completely divorced of each  
7 other. And, so, we're talking to people that know that  
8 they have, quite frankly, a frankness that they can  
9 apply to -- we want to get to the what, and we want to  
10 get to the why, and we keep asking, why, why, why.

11           And it may work its way up the chain of command,  
12 and a lot of times it gets to that training, manning and  
13 equipping part, and we didn't get it quite right. Well,  
14 the responsibility for the training, manning, and  
15 equipping part generally eventually falls to people who  
16 are wearing gold shoulder boards like me, and so it  
17 works its way up the chain of command.

18           So, we want to have that openness and frankness,  
19 and people feel that there won't be repercussions,  
20 whether they be administrative or from a legal  
21 standpoint, for them to be able to say, this is truly  
22 what happened, I cut a corner or I didn't do as what the  
23 procedurals said to do, I skipped a step, or whatever it  
24 happened to be. And, so, they can have that, and that's  
25 why I think NASA was pretty comfortable with that. Of

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1 course, a lot of their astronauts come from the Navy.

2 DR. WINOKUR: Right, and I was going to get to  
3 it later, but I'll just briefly get to it now. I mean,  
4 there are similarities between the Navy and the  
5 Department of Energy, in that you're both very diverse.  
6 I mean, you have a very diverse structure, you've talked  
7 about it here today.

8 The Department of Energy has production  
9 facilities and research facilities and it has cultures  
10 that were born during the Cold War, and it's really --  
11 and, so, are there lessons hopefully in terms of how you  
12 manage and create a climate of safety in such a diverse  
13 organization and what the Department of Energy might do.

14 And you've already pointed out in a sense that  
15 the gentlemen who fly the planes, they likely risk a  
16 little bit more, right?

17 REAR ADMIRAL NORTON: Right.

18 DR. WINOKUR: And that culturally dealing with  
19 them must be a little bit different than dealing with  
20 other aspects of your command.

21 REAR ADMIRAL NORTON: Well, as you said, Doctor,  
22 I kind of grew up and joined the Navy and got  
23 commissioned in 1981 at, arguably, the height of the  
24 Cold War, and everything was very much very secretive  
25 when it came to our nuclear weapons. I was part of that

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1 program early in my career for anti-submarine warfare  
2 weapon system that was out there, all the way through to  
3 nuclear propulsion.

4 I think what we see today, and I think it's  
5 healthy is, when we have near misses, we do critiques,  
6 and we have the ability to talk to everyone from the  
7 most senior person on the watch team to the most junior,  
8 for them to be able to sit down and say, this is what  
9 occurred, and this is how it occurred, and this is what  
10 we need to fix it.

11 And, you know -- some of it, it's not  
12 comfortable. A person may lose their -- temporarily  
13 have to go through remedial training or to get their  
14 qual back so they can stand watch, et cetera, which  
15 actually puts the burden on other people to fill in the  
16 watch. You know, we don't have this deep bench,  
17 especially on submarines, where people who are disqualified  
18 because of a mistake they made, and rightly so, they  
19 need to go maybe back under instruction to get that qual  
20 back, but somebody else then has to fill that  
21 watch-standing requirement, et cetera.

22 DR. WINOKUR: Thank you very much.

23 REAR ADMIRAL NORTON: Yes.

24 MR. SULLIVAN: Thank you. Admiral, I would like  
25 you to expound on some things that you've mentioned

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1 earlier. One of them was accountability, I think you  
2 talked about rewards and a stick, but you also talked  
3 about the fear of reporting, so people might not report  
4 things that they knew were wrong or safety situations.

5 And my experience is that those can be in  
6 conflict. If you try to encourage everybody to report,  
7 then you may get reports of people who did something  
8 wrong who might otherwise be punished. Talk to me about  
9 it, how does a leader balance that?

10 REAR ADMIRAL NORTON: It's a tough balance. You  
11 know, you want -- hopefully the integrity of your  
12 sailors and your Marines are such that they're  
13 self-reporting, and they can go back, rather than having  
14 other sailors sort of reporting on them, though that  
15 happens from time to time as well.

16 I truly believe if you give them the time and  
17 the tools and the training for them to accomplish  
18 whatever you expect them to do, they will do it right  
19 because they understand -- they have to also understand,  
20 I believe, what your mission is, and I think that's  
21 where it's important for the commanding officer at  
22 whatever unit level is to make sure that they understand  
23 exactly what it is they're doing, why you're being  
24 extended on deployment, why it's important to our  
25 nation, why it's important to the Navy for us to

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1 continue to strive day in and day out to support and  
2 fill in the blank of the mission that you're doing, you  
3 know.

4 I think when people understand that they're  
5 contributing to a greater cause, I think they truly will  
6 embrace the opportunity to do things right, and it's fun  
7 being part of that type of an organization. You just  
8 enjoy being there.

9 I remember my Air Wing Commander came down to my  
10 squadron late in my command tour, and he walked in the  
11 squadron, and he just looked at me, because he was going  
12 to go flying with us that day, and he goes, you know,  
13 KJ, he goes, I walked through your hangar here and I  
14 talked to your sailors, and I can just tell that they  
15 want to be here, that they enjoy what they're doing.  
16 And that was a great compliment from my ISIC, my  
17 immediate superior in my chain of command, and I think  
18 that's when you understand that you probably got it  
19 right.

20 MR. SULLIVAN: So, I guess what I'm trying to  
21 ask, Admiral, though is, if, in a perfect world, say you  
22 have a great leader who is doing great things, but there  
23 are occasions where the leader has to take over in a  
24 situation where there's an existing climate with  
25 problems or an existing culture with problems, and then

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1 people aren't doing the right things.

2 REAR ADMIRAL NORTON: Right.

3 MR. SULLIVAN: So you still have to face these  
4 decisions.

5 REAR ADMIRAL NORTON: You hold them accountable.

6 MR. SULLIVAN: Okay. And, so, I'll just make my  
7 statements and then I'll ask if you agree with me. So,  
8 if you said, well, we're just going to punish everybody  
9 proportionally, that leads to certain problems where  
10 people don't report. And on the other hand, if you  
11 don't punish anybody, then people won't fear any  
12 reprisals from doing the wrong thing, so a balance is  
13 required, and a balance isn't always easy.

14 Would you agree with all of that?

15 REAR ADMIRAL NORTON: I agree to the extent that  
16 I believe you have to hold people accountable. You have  
17 to make sure they understand your expectations, and then  
18 I believe you hold them accountable if it's -- I don't  
19 want to necessarily say malicious, but due to maybe  
20 malingering or just shoddy work or a bad attitude or  
21 whatever you're saying, if they're not meeting your  
22 expectations that you have been very, very clear on  
23 delivering to the entire crew, then you have to hold  
24 them individually accountable.

25 We have seen recently Admiral Richardson, for

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1 instance, hold a bunch of instructors accountable for an  
2 issue down in Charleston where he had to -- because  
3 people were sharing questions on an exam back and forth,  
4 et cetera, and I know that was difficult probably for  
5 him to do, but that was the right thing to do because it  
6 was an issue of integrity and the integrity of the  
7 entire program.

8 So, as difficult as it is, sometimes you do have  
9 to hold some demographic, however large or small it is,  
10 accountable if it's kind of this group think or there  
11 was a certain tolerance going on and people didn't bring  
12 to their leadership in a timely fashion things that were  
13 other than right, yeah.

14 DR. WINOKUR: Thank you very much, Admiral.

15 REAR ADMIRAL NORTON: Yes.

16 DR. WINOKUR: Ms. Roberson?

17 MS. ROBERSON: I don't have any further  
18 questions at this time.

19 DR. WINOKUR: All right. I think we want to  
20 thank you, we have a couple more, but I think we have to  
21 move on here. I want to thank you for your presentation  
22 today. It was excellent. I think we had a great  
23 dialogue with you, and everybody learned a lot, and I  
24 would just encourage you to maybe take a question for  
25 the record or if you have a moment, we're just

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1 interested in any additional insights you have about how  
2 an oversight organization like the Board might do a  
3 better job assisting the Department of Energy and  
4 helping it to establish a robust culture of safety.

5 REAR ADMIRAL NORTON: Well, as you know, going  
6 through the Navy Nuclear Program, I had a chance to sort  
7 of kind of see behind the curtain on what the Department  
8 of Energy does when it comes to the nuclear programs as  
9 well. Admiral Richardson has a role there in the  
10 Department of Energy, as you know, and I feel that the  
11 protocols that we have in place, whether it applies to  
12 the Navy Nuclear Program or to the Department of Energy  
13 Nuclear Program, or one and the same, and from what I  
14 can tell, they're the best in the world.

15 So, it's been a real honor for me, and I'm  
16 somewhat humbled by the opportunity to be able to talk  
17 to you folks here as the oversight for the Department of  
18 Energy concerning how we view safety programs in the  
19 United States Navy.

20 So, I want to thank you again for allowing me  
21 the opportunity to speak frankly about some things, and  
22 if there's any follow-up questions, et cetera, after  
23 this Board basically reports out, I would be more than  
24 happy to follow up with any other questions you might  
25 have.

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1 DR. WINOKUR: Thank you, Admiral Norton. I  
2 think we'll turn now to the presentation from Admiral  
3 Eccles.

4 REAR ADMIRAL ECCLES: Okay. Thanks very much.  
5 Thank you, and good morning. Am I live? I think so.  
6 You guys can hear in the back? I'll just try to put  
7 this thing about halfway down my throat.

8 Well, good morning. Thank you for having me  
9 here today. As the sign says, I'm retired from the  
10 Navy, and I just want to amplify for a second that  
11 point, that while I had the privilege of wearing the  
12 nation's cloth for an awfully long time and I had a  
13 wonderful time doing it, today I speak on my own behalf,  
14 and my views are mine and not representing the United  
15 States Navy, as Admiral Norton is, and I'll speak from  
16 my experiences certainly gained over many years of  
17 service, but my time today is as a private citizen, in a  
18 sense.

19 What I'm going to speak about today differs  
20 quite a bit from the perspectives that Admiral Norton  
21 and his team bring because rather than looking across  
22 safety as the complete, broad spectrum of everything  
23 that entails the slightest bit of injury or mishap at a  
24 low level, whether that's in dollar value or  
25 consequences to people, all the way to the largest

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1 catastrophes, that's the scope, I think, of what Admiral  
2 Norton and his team deal with in the Navy, that is full  
3 spectrum.

4 In my case, I'm going to talk to you in  
5 particular about one program, as you've said in your  
6 introduction, sir, the Submarine Safety Program or  
7 SUBSAFE, and about that I'll speak a little about  
8 origins, a bit about the fundamental building blocks of  
9 the program, as it was developed about 50 years ago, and  
10 then what that might mean, in my opinion, about ways  
11 that other high reliability organizations might consider  
12 those facets of that particular program in securing  
13 submarine safety and apply it elsewhere.

14 I do not have any firsthand experience in the  
15 Department of Energy or in the nuclear facilities that  
16 you oversee, but I have an interest in all of that, so  
17 let me see if I can pull it together and offer something  
18 of some value.

19 So, just over 50 years ago, the Submarine  
20 Thresher was lost at sea, and it was lost with all of  
21 her crew and 17 civilians. The ship was on a sea trial,  
22 and the failure was not pinned down to a particular  
23 failed joint, but it was determined that the ship  
24 suffered a flooding casualty, and then the consequence  
25 of the systems that were affected by that flooding

1 caused the ship to lose its ability to stay afloat and  
2 propelled, and, importantly, design flaws, which not  
3 only led to the flooding perhaps, but also led to the  
4 failure of systems that could have been used in  
5 recoverability prevented the ship from coping with that  
6 flooding.

7 So, there was a twofold effort then undertaken  
8 to consider a system of putting in place to prevent  
9 future losses like this, something that would have these  
10 attributes, to assure hull integrity to preclude  
11 flooding in the first place, and, of course, if that was  
12 100 percent successful, then there would be no purpose  
13 in the second, but knowing that all of these are systems  
14 of machines and men and women, there is no way to  
15 completely assure 100 percent likelihood of one or  
16 another thing.

17 So, operability and integrity of critical  
18 systems and components that are used to control and  
19 recover from flooding, bringing the ship safely to the  
20 surface, that was the second aspect of this.

21 In the underlined italics there with quotes  
22 around it is an important phrase used in the Submarine  
23 Safety Manual, the book that came out of the loss of the  
24 Thresher, and that is "maximum reasonable assurance."

25 Many people have observed that in and of itself,

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1 that's a conflicted phrase, and I'd say yes, and  
2 purposefully. That is, it was purposefully -- ah,  
3 thanks, I didn't know I had a button for that one,  
4 maximum assurance would be one thing, and few could  
5 argue what maximum assurance is, but, of course, if we  
6 really sought maximum assurance, ships wouldn't sail,  
7 planes wouldn't fly, people wouldn't engage in the  
8 application of lethal force for the purposes we use.

9 It's all a part of the mission to accept some  
10 level of risk, but maximum assurance, tempered by what  
11 is reasonable, while it's a phrase intention, it often  
12 gives people the opportunity then to make the right  
13 judgment in the face of challenges that have to be  
14 weighed on both sides, to what Mr. Sullivan said,  
15 finding the balance. So, we'll speak more about that in  
16 a few minutes.

17 Basic elements of a culture of safety when  
18 looked at from a SUBSAFE perspective are to recognize a  
19 responsibility from top to bottom in chains of command,  
20 not only in the military, but also in the civilian  
21 population that helps to design, maintain, construct,  
22 test and modernize our ships.

23 I would tell you that in the SUBSAFE program, in  
24 my experience, from top to bottom, workers feel a duty  
25 and obligation, a burden, and we'll speak a little bit

1 more in a few minutes about how that is instilled in  
2 people, in a sense the loss of Thresher was the  
3 inspiring event. It also becomes a touchstone. It's a  
4 real thing that happened. Real lives were lost. You  
5 can speak with the real survivors of the families who  
6 lost loved ones, and when you do that, as a worker new  
7 to the program or one who has been doing it for 20, 30,  
8 40, even 50 years, then my experience is that that  
9 responsibility is heartfelt, and it is because each of  
10 these individuals has been trained and educated in what  
11 the consequences would be of failing in this regard, and  
12 there are personal touches that can be made to reinstall  
13 that sort of responsibility.

14           Accountability is a topic we've already covered  
15 a little bit this morning, but it is essential in a  
16 program where consequences are as important, as in this  
17 program, that when requirements aren't adhered to, that  
18 responsibility is also an accountable responsibility.  
19 That is, one where there are consequences to one's  
20 failure to act or for the wrong actions.

21           Integrity, a rigid adherence to a code of  
22 behavior, is a presumption, but it's a presumption with  
23 controls, along the lines of in any human endeavor, we  
24 seek to put in place the right people, the ones who  
25 uphold the highest sense of integrity and who will be

1 true to that responsibility and understand the  
2 accountability that goes with it. But also to put in  
3 place second checks, to put in place methods of  
4 verification and validation, to look at things at  
5 tactical and strategic levels so as to avoid the  
6 downside consequence of having an incremental approach  
7 of accepting small amounts of risk, one day add to a  
8 tipping point that perhaps puts us in a bad place.

9 So, integrity is foundational, but integrity is  
10 not taken on blind faith. Elements of that culture of  
11 safety. If you were to decompose the program and say,  
12 well, you know, how do you take the loss of Thresher and  
13 the facts around it and generalize to a condition where  
14 a program that will last for decades, and likely  
15 centuries, can have enough of a foundation of building  
16 blocks that it properly covers the whole landscape where  
17 risk is dealt with. And remember, I'm not talking about  
18 the risk that a ship might hit another ship or the risk  
19 that a ship might back into something while trying to  
20 moor. I'm not trying to discuss whether the submarine  
21 will carry out its mission effectively.

22 This is a fairly narrow perspective, but it is  
23 one about the loss of ship and the attendant loss of  
24 life. So, in that, it comes down to something like  
25 this: Do we understand how we design the ship so as to

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1 not present undue risk or to have maximum reasonable  
2 assurance that we will not have that flooding, and in  
3 the event of flooding, that we will not compromise the  
4 system's recoverability?

5 To do that, we start out with a set of  
6 requirements, and the requirements are made as simple as  
7 possible, and in describing those requirements, an  
8 envelope of affected systems and components is  
9 described. The work discipline that evolves from being  
10 able to describe the scope of the responsibilities and  
11 then the requirements that go with each of those  
12 components and systems is brought under the topic of  
13 work discipline, and being able to explain to the work  
14 force, whether you're talking about the welder who's  
15 putting something together in new construction, or the  
16 same kind of a welder, perhaps his grandson, who 40  
17 years later working on another ship of the class near  
18 its end of life, is still putting the same integrity  
19 into the same kind of welded joint, or if you're talking  
20 about the people who in design of a ship have to take  
21 into account factors of safety and so forth, all of the  
22 moving parts of that requirements in the system of  
23 systems has to be translatable, it has to be well  
24 documented, and it has to be something where a sense of  
25 discipline about adherence is recognized.

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1           In material control, the bullet under it,  
2       correct material installed correctly, I think is fairly  
3       self-explanatory, but boy, there's a lot tied up in  
4       that. How do you make sure that what you're receiving  
5       in shipyard is what you ordered? Do you take it based  
6       on the vendor agreeing to have stipulated that, yes, he  
7       sent you the right wall thickness, or do we measure that  
8       wall thickness a second time upon receipt so that we  
9       make sure that we know what we've got?

10           Do we do that after we've done something to it  
11       mechanically so that if we bend, for example, a piece of  
12       pipe, but we're expecting a certain strength, did that  
13       strength change in the bend, and it did, but did it  
14       change in a way that we understand and that we are okay  
15       with.

16           So, material control is about receiving the  
17       right material, having specified it properly, then  
18       controlling it well so that we know exactly what's  
19       getting installed in the system and that it's being  
20       installed properly.

21           Documentation really is a bit of an underlying  
22       catch for all of this, but it not only comes in the  
23       sense of requirements and the design's integrity, but  
24       also an important phrase that permeates this whole  
25       system, "objective quality evidence." Objective in that

1 it can be measured, back to the point that it's hard to  
2 manage something that can't be measured. Well, here  
3 we're trying to measure things so that we can instill in  
4 our system a level of quality assurance that is given by  
5 evidentiary documentation. We don't just say, I want  
6 everybody to stand up in the morning and pledge that  
7 they'll weld well, that they'll wire things well, but in  
8 the case of the most important components of this, if a  
9 welded joint is critical to the safety of that ship,  
10 that welded joint is going to have additional  
11 assurances.

12 And you can go back today in a ship that was  
13 designed and built 20 or 30 years ago and find the  
14 signatures and records and hard copy of the individuals  
15 who performed all of those critical component processes.  
16 You can find how they attested to what they had done was  
17 correct, and in the most critical of those, you can  
18 follow them in a likewise scheme of objective evidence,  
19 a trail of certification by individuals who did the  
20 follow-on inspections, the nondestructive testing, the  
21 imaging, whatever was used to validate that yes, what we  
22 thought we were there to achieve and which we properly  
23 trained and educated a worker to achieve was indeed  
24 achieved because now we can perhaps in the case of an  
25 x-ray look right through a weld and show that its

1 integrity was as fulsome as we expected.

2 So, that objective quality evidence is something  
3 that is not only in the early days in design and  
4 construction, but it'll be just as true on a ship with  
5 25 years of life where that ship undergoing some  
6 modernization needs to have additional work done inside  
7 that scope or that envelope, the same process of  
8 objective quality evidence is used, whether we're  
9 maintaining, modernizing or doing new construction.

10 Compliance verification, I've kind of alluded to  
11 some of that. Inspecting on top of the work that's  
12 being done, you do the right work with the right  
13 material, you do it right the first time, you attest to  
14 it, you second check it where you need to, and then you  
15 conduct inspection and process surveillances, whether  
16 those are 100 percent or spot-checking. There's a lot  
17 of decision space in which we work for that, but we can  
18 get into questions there, if you like, but compliance  
19 verification is intended to build a level of assurance  
20 that not only we doing what we intended to do, but we're  
21 achieving the results that we expected to achieve.

22 I'll speak more on another slide about a balance  
23 of separation of authorities, but I think that's a key  
24 part of how the Navy achieves within this framework a  
25 sense of balance in getting to the right place, and the

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1 need for continual education and training, I think, pops  
2 up in an Admiral Rickover quote that I have at the end,  
3 it is human nature for people to reduce the retention of  
4 knowledge to become more complacent in any endeavor I  
5 think.

6 And, so, the need to reinforce and to raise the  
7 level of training, and to take into account changes in  
8 the way we do what we do, especially as technology gives  
9 us opportunities to do things differently and better,  
10 there is education and training that goes with that, so  
11 whether it's to stay up-to-date or to reinforce the  
12 basic tenets, that's a big part of this program.

13 In the area of compliance verification, just to  
14 give an example of a way I think the net we weave that  
15 goes beneath the wire we walk has sort of -- there's a  
16 couple of different dimensions of webbing. In the top  
17 case, before a ship goes to sea coming out of a major  
18 overhaul or in the case of new construction, there is a  
19 ship-specific set of audits that's done to go through  
20 every element of how that ship was designed and built  
21 and that we built the verified design that we met the  
22 requirements, both for construction and all the material  
23 pieces of it, and that the design itself had been  
24 properly reviewed and met its requirements.

25 All of that is somewhat diametrically opposed to

1 another simultaneous set of audits that's going on, that  
2 is that they're always going on. In any activity or  
3 facility where we do this kind of work, then we go in on  
4 a regular basis and perform functional audits to look at  
5 the health of the system and to specifically pull  
6 examples out of the record sets of that objective  
7 quality evidence and look for compliance with the  
8 program requirements at the highest level and all the  
9 way down to the nuts and bolts.

10 And in doing that, and doing a sampling process  
11 for that, we find that we can highlight in each of these  
12 two cases what's right, what's not so right, where best  
13 practices need to be reinforced, particularly if you go  
14 from activity to activity, but also as we build ships,  
15 if we build them well and successfully, do we take  
16 things for granted and begin to atrophy some of the  
17 compliance, or do we build upon the success of the last  
18 one.

19 These certification audits and functional audits  
20 together give us a sense of confidence that not only is  
21 each individual hull ready to go, but also that the  
22 people and facilities and processes who are making this  
23 happen every day are complying properly with those  
24 requirements. So, the second one is more of the health  
25 of the program, and the top one is the readiness of that

1 individual ship.

2           On the subject of balance and separation of  
3 authorities, here's how the system works. When I was a  
4 program manager for Seawolf Submarines, and in other  
5 roles, but as a program manager, I would present to a  
6 certification authority, and generally that was my boss,  
7 and I served in both of these roles, so I can kind of  
8 speak -- in fact, I served in all of these roles one way  
9 or another.

10           When I was a program manager, I would talk to  
11 the one with whom the buck stopped, the certification  
12 authority, these days that's the deputy commander at the  
13 Naval Sea Systems Command for Undersea Warfare, and it's  
14 Admiral Jabaley. So, today, a program manager, for  
15 example, for Virginia-class submarines will walk in to  
16 Admiral Jabaley, and it's not done in one moment, in one  
17 day, but over a series of months, he will present to him  
18 a full set of documentation and auditable results that  
19 show that the ship he's getting ready for sea trials  
20 should receive the proper certification without which it  
21 will not sail, and in that certification, he can -- that  
22 Admiral Jabaley, the guy in the gold box in the middle,  
23 can rest assured and can examine that not only has the  
24 platform program manager done what it took to get the  
25 nuts and bolts put together, but he complied with the

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1 requirements of the Submarine Safety Program Manual, and  
2 that it's agreed by an independent technical authority,  
3 in that case the chief engineer for Naval Sea Systems  
4 Command, and his team, as well as an independent safety  
5 and quality assurance authority who doesn't report to  
6 the program manager, does not report to the chief  
7 engineer, and is in the fabric of all of this for the  
8 purpose of examining whether or not compliance is  
9 ongoing, that all three of those pillars are of a like  
10 mind.

11           When they're not, then that surfaces issues, and  
12 issues like that are the things that would prevent a  
13 certification authority for saying, let's move ahead.  
14 And having acted as that certification authority myself,  
15 I can tell you that I was looking for the balance of the  
16 program manager saying, I've got this date for sea  
17 trials, and I've got a ship that says it's really ready,  
18 I've got all of the other peripherals that go with it,  
19 the records of having done all the construction, having  
20 done all the testing, having done all the quality  
21 assurance. And my only hang-up is that I've got one guy  
22 over there working in NAVSEA's engineering house who  
23 doesn't like the thickness of something.

24           We nailed that one down before we made a  
25 decision that the ship is ready to go, and by having

1 independence in each of those voices, we had the ability  
2 to hear any of those solo opinions, or two of them  
3 saying, we're moving too fast. These things create a  
4 constructive tension around one another. On the worst  
5 days, they're barriers to moving ahead, but you have to  
6 ask yourself -- that's why we put it in place, right?  
7 We're trying to create a barrier whose job is to say,  
8 let's not let the thing that happened to Thresher happen  
9 again, and that particular thing that happened to  
10 Thresher, which was probably a sil-brazed joint and a  
11 piece of piping connected to the seawater systems, is  
12 not very likely to happen because we've examined that to  
13 death.

14 But so many other things are critical, and so  
15 many small things, when accumulated, can present a  
16 larger risk that it's this team, despite the program  
17 manager's responsibility and cost and schedule -- the  
18 technical authority's responsibility for getting it  
19 technically right, the safety and QA authority to show  
20 that it's all properly documented, despite the fact that  
21 those can be intentioned.

22 In the end, they're working together so that  
23 when the certifier says the ship is ready, then it  
24 really is, and then under the operational control of the  
25 fleet commander, they've got the ability to send it out.

1           Now, that same construct is fundamentally in  
2 place for all major work, like overhauls, through the  
3 life of the ship as well as a new construction, and  
4 there is a version of this that goes on inside the fleet  
5 day in and day out when commanding officers at sea make  
6 decisions to break into these same boundaries and do  
7 work, or when they're in port, just in the execution of  
8 maintenance, whether it's corrective or preventative,  
9 that same notion of integrity of process is put into  
10 place, and there's a certification at the fleet level  
11 that mirrors this.

12           So, challenges. Such a system sounds perfect,  
13 right? Well, no system is, and the ability to generate  
14 these human attributes of ignorance, not even  
15 recognizing the problem, sometimes really does crop up.  
16 We can find people who, without the right training,  
17 without the right education, can certainly demonstrate  
18 ignorance, and that can be a problem if you've only gone  
19 one deep in a critical place.

20           Arrogance is a much more common problem, and it  
21 isn't arrogance like the way you might use that word to  
22 describe an individual that's pretty distasteful. I  
23 mean, this is the kind of arrogance that the best people  
24 can still have, that they're pretty sure they understand  
25 what's happening, and without someone else giving them

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1 the support needed to recognize or for themselves to  
2 question their own assumptions, then this arrogance  
3 presents all kinds of challenges.

4 I had some experiences, as was said in the  
5 introduction, in the Deepwater Horizon investigations,  
6 and in that, I think it's evident by the facts that  
7 there were people making decisions on the rig who hadn't  
8 been given the ability to know, so in some way were  
9 ignorant of what was happening down in the earth's  
10 crust, and they didn't recognize some of the risks that  
11 were being taken.

12 They also used a presumption of knowledge to  
13 rationalize some of the steps that they bought into.  
14 They looked at test results that were evidently failing,  
15 and they found a way to rationalize that those results  
16 were positive. I think that was a collision of  
17 ignorance and arrogance at that same point, and,  
18 frankly, I think it was a case of the system setting the  
19 team on the rig up for failure by not giving them  
20 another voice. A less ignorant, a more knowing voice,  
21 and one that was in the business of routinely  
22 questioning its own intellectual superiority.

23 In fact, in the end then, much of that can lead  
24 to complacency, but you know, even people who aren't  
25 ignorant and aren't arrogant can still say, It's been 50

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1 years since we lost one of these submarines, you know,  
2 in the years before that, which was approximately 50  
3 years, the Navy lost something like 16 submarines to  
4 noncombat losses, and since then, just one, and it was  
5 not a submarine safe, certified submarine. That was  
6 Scorpion.

7 If we wanted to, we could sort of rest on our  
8 laurels or haunches or something right now and say, I  
9 guess that statistically it ain't going to happen again.  
10 We'd somehow have it right. I don't think anyone in  
11 that system looks at it that way, but the danger is that  
12 we might, and that would be a sense of complacency.

13 Now, the real truth is that the same risks that  
14 are presented in those 16 earlier incidents and the two  
15 that happened in nuclear submarines all need to be  
16 guarded against today, and so these challenges are ones  
17 that leaders must remind themselves of.

18 I do not expect that the people at the deck  
19 plate level every morning are getting up saying, let me  
20 think about complacency, right? Now, I hope they do,  
21 but I don't really think it's what they're thinking  
22 about in the line at Starbucks or wherever.

23 I do think, though, that they think about it  
24 frequently because it's instilled by leaders who get  
25 down there on deck plates, who do that walking around,

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1 who check in on people who are new on the job, who ask  
2 the people who should be mentors whether they're doing  
3 that mentoring, and when is the last time they had a  
4 workplace conversation about complacency.

5 So, Admiral Rickover, in his long-term view,  
6 said, you've got to drive these ideas into practice with  
7 courageous patience, and importantly, he said, all of  
8 this can be overturned or subverted through apathy or a  
9 lack of follow-up, so a continuous effort is required,  
10 and he was famous for his diligence and his continuous  
11 effort. That legacy has lasted far beyond his time. It  
12 is a part of what goes on in the Submarine Safety  
13 Program.

14 I think it's important to recognize that while  
15 Admiral Rickover was personally involved in the hearings  
16 that went on with the Atomic Energy Commission back in  
17 the -- or I'm sorry, the Joint Committee on Atomic  
18 Energy right after the loss of that ship, it is a  
19 separate program, the Submarine Safety Program, from the  
20 one that Admiral Rickover and his follow-on, Admiral  
21 Richardson today, Admiral Donald a few years ago, have  
22 instilled in Naval Reactors, but there are some similar  
23 characteristics and traits, and this diligence and  
24 discipline and the need to guard against complacency is,  
25 I think, a common factor between the two.

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1           And that's probably about as far as I will go in  
2 terms of trying to weigh into Naval Reactors territory,  
3 but I think it's important when you're looking at this  
4 from the perspective you all have, that these systems  
5 are hard fought, hard won. It continues to be a  
6 challenge every day for the people who work in this  
7 environment to get it right, and every morning when they  
8 wake up, the leaders in this community do have to remind  
9 themselves of these challenges and this kind of a  
10 long-term view.

11           In going back to Thresher and asking, how do we  
12 personalize this for individuals, how do you take  
13 somebody who has shown up at a place like Portsmouth  
14 Naval Shipyard today working on submarines that were  
15 designed and built before that individual was born, in  
16 some cases, how do you get that person to understand  
17 that the events of 51 years ago, and a history that goes  
18 50 years before that, is relevant in today's world and  
19 the work that individual does right now.

20           I think part of it is that we listen, pretty  
21 regularly, at least annually, believe it or not, to the  
22 audiotape, about two minutes long, of the sounds of the  
23 Thresher hull imploding, and all those people dying.  
24 It's a terrible thing to hear, and it would be abstract  
25 if it wasn't being narrated by someone who is telling

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1 you live what it is that you're about to hear, and then  
2 listening to that, it raises the hair on the backs of  
3 the necks of most people. You have to be damn near dead  
4 to not get a little emotional about that.

5 And I think that what that does is it reinforces  
6 on a regular basis for people that this is about real  
7 folks, and it's about their own brothers and sisters,  
8 fathers, mothers, and their own kids and grandchildren.  
9 This is who they have to worry about.

10 If you have a tragic event like this and you  
11 have an opportunity to do something about preventing its  
12 recurrence, and you can tie people back intellectually  
13 and emotionally to what did happen and the need to  
14 prevent its recurrence, then I think you've got a strong  
15 connection that has to be made and sustained.

16 So obviously there are many other famous events  
17 like the ones mentioned earlier. Challenger and  
18 Columbia both had people who came over from NASA, looked  
19 in the Navy and looked in many other places and said,  
20 how do programs that seem to be succeeding instill the  
21 right traits in place in their people? How do leaders  
22 embrace this need and keep it forefront in what they do?  
23 How is it that the foundation and the construction of  
24 the program, the way it's documented and the way it has  
25 requirements that don't change frequently, how is all

1 that built and then attempted to try to bring those back  
2 to using those same notions in other environments.

3 NASA, I'm not an expert on the NASA side of it,  
4 but a predecessor of mine in the chief engineer job was  
5 one of the ones who answered the question in the early  
6 2000s to go over and meet with the Challenger group and  
7 gave them some testimony on the SUBSAFE program, not  
8 unlike what I'm talking about this morning, and that was  
9 Paul Sullivan. And when he did that, it began this  
10 dialogue that I think has grown into where Admiral  
11 Norton is really a full-fledged member of their safety  
12 board, that they open their eyes and minds to other  
13 parties who have similar stakes and interests. I think  
14 that's all healthy.

15 Professor Meshkati, who is here, and I were both  
16 on this team that did the report on the far right. We  
17 were not on the one that did the report to the President  
18 in the middle, but looking at that Deepwater Horizon  
19 thing, I think there's, even today, an ongoing dialogue  
20 in the energy industry about how we don't let things  
21 like that happen again.

22 It's a best practices discussion, but it's a  
23 really different environment from the one in which the  
24 Navy put together a list of requirements, built the  
25 framework around which all that stuff would be executed,

1 and then requires it of our people, holds them  
2 accountable under the Uniform Code of Military Justice  
3 in the military case when they don't comply, and  
4 instills that same requirement in contracts, puts it in  
5 place so that it isn't a negotiable point. It is like a  
6 specification point.

7 In fact, it literally is in the statement of  
8 work and the spec that the Submarine Safety Requirements  
9 Manual will be invoked, and we can talk more about this  
10 as you like. I would tell you that we get the same kind  
11 of support out of people who are required by contract,  
12 like the workers at the submarine construction yards,  
13 and even at the subcontractor level today as we do from  
14 the sailors who are working these things either because  
15 they're already in the crew or they just came from and  
16 are likely go back to the crews of these same ships.

17 People who sail in these ships recognize  
18 firsthand how important it all is, but I think it's also  
19 recognized by many people who never get the privilege to  
20 sail in them but they have a responsibility to get it  
21 right. So that's my experience.

22 The ability to translate that then into  
23 something like an energy industry and be able to avoid  
24 blowouts and the consequences in a rig, that's a more  
25 tenuous discussion because not all the same controls

1 exist, as we have the luxury of imparting on the Navy  
2 side.

3 And then you can't beat something at the end of  
4 a show like a big picture of a Virginia-class submarine  
5 like New Hampshire up there in Groton, Connecticut, so  
6 that's my closing slide.

7 I think I've closed with a picture of some Navy  
8 ship for every briefing I've done for 25 or 30 years.  
9 Okay. That's all I have. I'm happy to answer any  
10 questions you may have.

11 DR. WINOKUR: We do have a few. Thank you very  
12 much for the presentation. Once again, it's very  
13 insightful. I'm going to start the questioning, and I  
14 want to ask you from a personal point of view when you  
15 were the chief engineer for this program, what did you  
16 do personally to convince yourself that you had the  
17 culture of safety you needed and that these subs were  
18 being built to the specifications they needed to be  
19 built to? What did you personally do?

20 REAR ADMIRAL ECCLES: Yeah. So, as an  
21 individual, in my personal role, I guess I'd say I had  
22 three or four things that were really important. One is  
23 that I made a regular practice of getting out to the  
24 places where we were working on ships. I walked ships  
25 every time I walked into a shipyard. I don't think I

1 ever have gone to a shipyard and just gone to a meeting.  
2 That just is a huge mistake for any officer to do. It's  
3 about the sailors. It's about the ship workers.

4 And, so, speaking with welders on deck plates,  
5 speaking with people who are putting components in place  
6 and visiting the places where our manufacturers do what  
7 they do and test the devices that are going to end up on  
8 our ships, those factory floor tours and those  
9 walk-arounds on ships are very important.

10 An extension of that is that in my role as the  
11 certification authority and as a program manager, I  
12 would as often -- well, always as a program manager, I  
13 would make the first dive on a submarine that was in new  
14 construction. That's part of the deal is if you're  
15 presenting this thing for certification, then you'll be  
16 there with the captain and crew on the first dive, and  
17 not alone. The Director of Naval Nuclear Propulsion has  
18 done that for as far as I know every ride ever made on a  
19 submarine on its first dive, and I've personally been  
20 out with several of them on several of those.

21 DR. WINOKUR: It's called incentives.

22 REAR ADMIRAL ECCLES: It's a pretty personal  
23 incentive, and just to take the incentive to the right  
24 place, the other couple of bunks on those ships are for  
25 the presidents of the two construction yards. These

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1 days those Virginia-class ships that are going to sea  
2 are built -- each of those ships has been in part built  
3 by Electric Boat and in part by Newport News  
4 Shipbuilding, and so the chiefs of those two yards are  
5 under way on those sea trials.

6 I think that makes it personal, and I think it  
7 also makes it a great leadership example for the people  
8 who every day are doing the work on those ships. They  
9 want to know that there's commitment, and that's one way  
10 to show it.

11 So, personal commitment and getting out there  
12 with the people who are doing the work is a piece of it.  
13 The other is a very diligent process of selecting the  
14 right people for the right jobs. And, so, it was my  
15 privilege a number of times to influence people's  
16 careers by giving them the opportunity to get into this  
17 kind of work, but also to have them understand that only  
18 the best get that kind of assignment, and then to hold  
19 them accountable for doing a good job while they were in  
20 it.

21 And I guess another factor in all of this would  
22 be to have the knowledge gained through experience and  
23 education to be able to personally dive into the details  
24 on some of these things and ask the hard question when  
25 someone says, we accepted this, even though it wasn't

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1 within some parameter of acceptable conditions, the  
2 reason we accepted this outlier is as follows. If the  
3 people who are making the decision to accept that are  
4 led by folks who cannot understand the basis for  
5 acceptance, then there's a breakdown in what I think is  
6 a wholesome system.

7 So, I believe that just as being a  
8 NATOPS-qualified aviator in a plane requires you to have  
9 not only the experience and the skills, but the basic  
10 knowledge, the same kind of idea holds true on the  
11 submarine side. It holds true in any really critical  
12 safety endeavor, and I think as you move up in the  
13 leadership ranks, you've got to retain some ability to  
14 get back down into that stuff.

15 As a diver, I dove up until my last couple of  
16 weeks in the Navy. It just didn't ever seem to me that  
17 I was allowed to get old enough to stop doing it, okay,  
18 and the troops like it when they see you do it because  
19 they know you're committed, but I'll tell you, it also  
20 means I'm checking whether the regulator's in good  
21 condition or not before I decide to take breaths  
22 underwater with it.

23 So, I think that kind of personal commitment is  
24 commonplace in the system. I think it's exactly the  
25 kind of thing you find in the people in leadership

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1 positions in aviation surface submarines, people taking  
2 care of our warfighters, people taking care of our  
3 weapons, and doing all these other things that most  
4 Americans would consider high-risk, but finding a way to  
5 do it with safety in mind for our people.

6 DR. WINOKUR: Were there metrics that you  
7 tracked in your role as chief engineer, things that were  
8 on your desk?

9 REAR ADMIRAL ECCLES: Yes, and some of those  
10 also were on some other people's desks, and that's part  
11 of the overlap of requirements here. A guy who's an  
12 individual who might be the certification authority and  
13 one of those other legs like the chief engineer, and  
14 I've been in both of those jobs, so I know that we often  
15 were looking at the same basic measures of  
16 effectiveness, and they included things like in a  
17 long-term view, what are the trends in these audits that  
18 we do in facilities?

19 Are we seeing the major exceptions or the  
20 recommendations that would be written by audit teams for  
21 improvement? Are those things growing and how do we  
22 characterize and categorize them? Are they presenting  
23 current risks to ongoing programs or are these good  
24 ideas that we should take from one activity and extend  
25 to another.

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1           We would have recommendations that we tracked as  
2 individual numbered items that each unto themselves were  
3 important, but they could have really different  
4 meanings, one to another. And the accumulation of those  
5 things was one kind of an indicator of whether or not we  
6 were seeing progress in a good direction or in a not so  
7 good direction. And that was true system-wide. It was  
8 also true at an activity level and on a project basis.

9           So, in all of those areas, yeah, we would look  
10 at measurements, even to the point of looking at things  
11 like how many quality assurance findings are we getting  
12 in a given production activity. Is there something not  
13 coming out right because there's a problem in the  
14 process, occasionally even ferreting out wrongdoing, but  
15 that's pretty rare, but we would have from time to time  
16 a recognition that someone we were counting on did have  
17 an integrity problem, and it was picked up because the  
18 system has enough mesh to it that we could eventually  
19 filter out the problem, but when you find that, whether  
20 it's a malfeasance or an innocent mistake, you've got to  
21 get to the bottom of it. So, we did that through  
22 indicators.

23           DR. WINOKUR: Mr. Sullivan?

24           MR. SULLIVAN: Thank you, and good morning,  
25 Admiral, or Mr. Eccles, whichever you prefer.

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1 REAR ADMIRAL ECCLES: Good to see you, sir.  
2 It's always Tom to Mr. Sullivan.

3 MR. SULLIVAN: Maybe it's just Tom, okay. I  
4 want to go back, I hate to take the picture of the  
5 submarine sitting in Groton, Connecticut, off the  
6 screen, but if we go back to slide 7, which was I think  
7 your three-headed monster there.

8 REAR ADMIRAL ECCLES: Yeah.

9 MR. SULLIVAN: So I want to ask you, where is  
10 cost control in that diagram? I seem to recall back the  
11 submarine program having a Congressional -- the Seawolf  
12 Program having a Congressionally mandated cost cap,  
13 which had to add a degree of difficulty to what looks  
14 like an otherwise simple diagram. Would you speak to  
15 that?

16 REAR ADMIRAL ECCLES: Yes, happily. So, the  
17 program manager is the one in that picture who has  
18 responsibility for cost and schedule control, and really  
19 is the leader of getting the job done when it comes to  
20 all of this, and the others could be looked at as  
21 controls.

22 The others are flying in support. You know, if  
23 this was a formation, you would say that the one with --  
24 on point or with lead is that one at the platform  
25 program manager level, and he might well be the junior

1 one in the picture, but he's that individual for that  
2 particular moment and project has the lead.

3 The Independent Technical Authority is really a  
4 large organization with a lot of people, just as the  
5 platform program manager's team is a fairly large  
6 organization with diverse skill sets, but that program  
7 manager is the accountable one, and when I was in that  
8 role, besides the seriousness of getting under way with  
9 the ship the first time, making the first dive and all  
10 those things, saying let's be personally committed to  
11 the right thing. I also had someone brief me on the way  
12 into the job that it was I think two different felonies  
13 if we somehow failed on that cost cap, and that got my  
14 attention as well.

15 So, it's a constraint, for sure. How is it  
16 managed? Well, honestly, through a bunch of judicious  
17 decision-making, so that what we don't do is let any of  
18 this get so out of balance that we're either shorting  
19 ourselves and taking risks we shouldn't take, or  
20 creating an opportunity for a risk-averse culture to run  
21 so rampant that we literally tie the ship up and never  
22 get under way.

23 We couldn't have it that way, so if you have to  
24 come in under a cost cap but you've got to get under  
25 way, then finding that way is one of them and is one of

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1 the great challenges.

2 In my own case, with the SEAWOLF submarine,  
3 Jimmy Carter, we actually found between the contractor,  
4 in that case the prime was General Dynamics/Electric  
5 Boat, and the Navy, that we had a common interest in  
6 driving to that cost cap, and we worked a whole bunch of  
7 day-to-day systems of controls, so that we would not pay  
8 too much attention to the little stuff and pay a great  
9 deal of attention to the things that mattered most.

10 And we found efficiencies the way we did that,  
11 and we actually did control it and came in with like a  
12 dollar and a half to spare at the very end. In fact, I  
13 don't think I admitted we had that buck and a half, but  
14 we slid into home on that one, and --

15 MR. SULLIVAN: You were a buck and a half away  
16 from two felonies, is that what you're telling us?

17 REAR ADMIRAL ECCLES: It was something like  
18 that, maybe a buck 350.

19 MR. SULLIVAN: Okay. Well, thank you for that.  
20 I mean, it just seems to me, though, that there must  
21 have been situations where there was a problem and then  
22 there was a solution one and a solution two, and two was  
23 more expensive than one.

24 REAR ADMIRAL ECCLES: Yes.

25 MR. SULLIVAN: But two would have given you a

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1 better product and perhaps additional margin of safety.

2 REAR ADMIRAL ECCLES: Right.

3 MR. SULLIVAN: How were those decisions made?

4 REAR ADMIRAL ECCLES: Yeah, great question. I  
5 think those decisions are made every day, and I think  
6 that there are many, many examples of those, and I think  
7 in the end, that is the dialogue that these arrows might  
8 represent where you get a conversation going that says,  
9 I could do it the way I've always done it, but I know  
10 what that's going to cost, and maybe there's a risk that  
11 goes with that that is something like a reliability  
12 challenge. And then there's a new way of doing it, and  
13 that new way might cost me some more investment up  
14 front, but it might give me the reliability that's been  
15 eluding me for all this time.

16 And, so, finding a way to translate that into  
17 terms that can be recognized as value and accepting  
18 them, that's a tough one, but if it can be done in  
19 dollars and cents and in the near term, then that makes  
20 decision-making pretty easy. Is it worth doing as a  
21 business case? And that, frankly, when those go the  
22 right way, nothing is hard.

23 The hard ones are when you say something like,  
24 my savings will come so far out in the future that it's  
25 not inside anyone's incentive plan to get rewarded for

1 that, or when the way to translate that is, we'll be  
2 more operationally effective by doing the more expensive  
3 thing, then how do you make that trade?

4           And very often, the people in this diagram would  
5 turn to the requirements officers in the Pentagon and  
6 look for another value discussion, too, that would say,  
7 I have a choice here, and I could do this and give  
8 myself some margin on cost for the future, but if I do  
9 the right thing, and this is my recommendation, then  
10 we're going to be happier in the end because you will be  
11 this much more capable. Maybe stealthier, maybe more  
12 accurate with weapons fire.

13           And, so, whatever that proposition would be, we  
14 would look to the people who set the requirement on the  
15 operational side and who actually hold the purse strings  
16 as well to say, I'm thinking about spending the treasury  
17 like this, what do you think. And on the best days,  
18 those conversations go really well.

19           I think the -- it may be a bit off topic, but  
20 some of the improvements done to lower the cost of  
21 Virginia-class submarines, and this is pretty much out  
22 of my scope because it's largely after my time, but much  
23 of that thinking and work required people to embrace  
24 long-term benefits from near-term investments, and it's  
25 paying off now. The first of those ships is at sea.

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1 Things are working right, and as they continue to come  
2 off the production line, they're going to be built at a  
3 lower cost for the same capability, and they wouldn't  
4 have been able to do that if someone didn't have the  
5 courage to spend some serious money a few years ago.

6 In the end, the taxpayers will be better served.

7 MR. SULLIVAN: Okay. Thank you. I do want to  
8 shift gears a little bit now, and I want to ask you  
9 about the fire on the USS Miami, which I think occurred  
10 in 2012.

11 REAR ADMIRAL ECCLES: Okay. '12. June I think,  
12 yes.

13 MR. SULLIVAN: Yes. So, just a little over two  
14 years ago now.

15 REAR ADMIRAL ECCLES: Yes.

16 MR. SULLIVAN: And, so, for those who aren't  
17 familiar, the USS Miami was undergoing overhaul up in  
18 Portsmouth Naval Shipyard. There was a fire that  
19 ultimately was decided was deliberately set by a  
20 disgruntled shipyard employee.

21 REAR ADMIRAL ECCLES: Yes.

22 MR. SULLIVAN: But the actual location of the  
23 fire remained undetected long enough to allow the fire  
24 to grow out of control, and actually threatened the  
25 reactor compartment. It didn't actually go to the

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1 reactor compartment, but there was concern that it  
2 might, it burned out of control for so long.

3 So, can you speak to the lessons that were  
4 learned within the community -- the Navy's maintenance  
5 community for what happened there and how safety was  
6 subsequently improved?

7 REAR ADMIRAL ECCLES: Yes. I can speak to some  
8 of that, and some of the evolution of thought that's  
9 gone on on that subject is after my time, so, you know,  
10 I probably have an impartial or an incomplete set of  
11 comments on that.

12 One thing I would like to do is clarify that  
13 from my perspective, and I think the way the Navy  
14 spokesman put the word out at the time, the fire was  
15 confined to the forward end of the ship, and yet it was  
16 devastating for sure, and the consequences of it were  
17 pretty terrible.

18 The reactor compartment and the propulsion plant  
19 were isolated from the casualty, and remained manned  
20 throughout, and was in a shutdown mode for a couple of  
21 months preceding. So, to the best of my knowledge, and  
22 it's not my territory either, but that was not a factor  
23 in that fire. But, yes, it was a big, devastating fire,  
24 and you have it right that it was a deliberate criminal  
25 act of arson, and it was done by somebody whose arson

1 tendencies weren't detected until some time afterwards.

2 We were proceeding on the notion at the time as  
3 investigators, doing both the safety investigation and  
4 JAG manual investigations, and I was more on the side of  
5 reviewing results from those things, that there was a  
6 cause that was more of a technical cause in nature. We  
7 were looking for accidental reasons for this, and the  
8 damage was so sufficient or so complete that it was  
9 really difficult to get to the bottom of that clue set  
10 and pin anything down. And we pinned down a few ideas,  
11 but, you know, saying, this is the one and we know it  
12 conclusively, couldn't get there.

13 So, it's good that in the end a criminal  
14 investigation determined what really was the cause, and  
15 a confession came from that, and a guilty finding. Your  
16 point that having been started deliberately but then  
17 allowed to grow by lack of detection led to extreme  
18 amount of damage, that's true. And, so, there's been  
19 some work done inside the Navy and with people outside  
20 who work on fire fighting and fire detection systems to  
21 say, can we raise the game in how we detect things like  
22 this?

23 And I'll tell you, the Navy's view has been not  
24 to confine this to just a submarine discussion or a  
25 Portsmouth discussion, but a broader one across our

1 industrial base, public, as Portsmouth is, and private,  
2 and across all ship types, and even shore facilities.  
3 And say, where do we run the risk? That whether  
4 deliberate or accidental, a fire could go undetected and  
5 then result in a significant amount of damage or risk to  
6 people and all of that.

7 So, earlier detection, some of that by unmanned  
8 systems, some question about whether the way watch  
9 standards are deployed and how that process is run  
10 operationally is another factor. Beyond that then, how  
11 are responders organized, and are the people trained who  
12 show up as professional firefighters and as crew members  
13 on that ship and nearby ships, all focused in their  
14 energies and their equipment and their tactics to be  
15 able to combat this together, or is there a hand-off  
16 process?

17 And that night, there was a process that was  
18 followed, and it proved to yield a lot of lessons  
19 learned. People were really spent by the heat  
20 exhaustion that came from that fire. Additional crews  
21 had to be called up. Firefighters came in from out of  
22 town. Firefighters came from other communities.

23 Interestingly, some of the firefighters who came  
24 as volunteers from outlying communities were people who  
25 had worked their day shift at their day job as workers

1 in the shipyard, and actually some of those people were  
2 particularly helpful in being able to show up as a  
3 firefighter who might not have known anything about a  
4 submarine, but in that case, some team members did.

5 So, learning that being able to take the people  
6 who live just outside the gate and familiarize some of  
7 them in the event they might have to be called is a part  
8 of that decision or -- that education process. So,  
9 those are kind of the main lanes that people are going  
10 down.

11 Because the cause was deliberate, those  
12 accidental ones were able to be ruled out, the ones that  
13 were theories. On the other hand, each of those was a  
14 thread worth examining, too. Could it be that by  
15 employing certain kinds of equipment, we could have led  
16 to a fire through an accident? And should we change  
17 that equipment? So, there had been some component and  
18 equipment changes done for tools that shipyard workers  
19 use and ways that ships are equipped. How good is a  
20 battle lantern versus a modern LED light at providing  
21 light that cuts through dense smoke, or are any of those  
22 any good, and how do we find a downed firefighter if one  
23 of them is left behind? How do we make sure we don't  
24 leave anybody behind, and we know when we've got someone  
25 who has been brought unconscious?

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1           There are tools that are used in civilian  
2 firefighting that can be used aboard ships as well. So,  
3 all those kinds of things, how do people communicate  
4 with one another, which is a classic one. Every time we  
5 bring people together in a network who weren't  
6 deliberately networked before. So, in each of those  
7 cases, good news is there are lessons learned,  
8 documented. There are plans of actions and milestones  
9 that are being used to implement those changes, and also  
10 to a point that Admiral Norton made, there's a clear  
11 separation between the Judge Advocate General's  
12 investigation, the process that leads to accountability  
13 from a misconduct perspective, and that -- and a  
14 judicial one in the case of this one that got prosecuted  
15 up in New Hampshire, but also then on a different tack,  
16 is the question: What happened and how did it happen  
17 and why did it happen and how do I look at that in terms  
18 of a safety investigation, and give people the freedom  
19 to speak without risk that that will cross paths over to  
20 the JAG discussion so that we can get the lessons  
21 learned that are as fact-based and objective as  
22 possible out to the fleet as soon as possible through  
23 the Naval Safety Center and their components. That, I  
24 think, worked very well in this case.

25           MR. SULLIVAN: Yeah. Thank you.

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1 DR. WINOKUR: I want to ask you a question about  
2 changing an existing culture, so let me start out by  
3 saying we've acknowledged, and I think it's true that  
4 the Navy's often asked to help out in terms of providing  
5 its insights on safety and safety culture. And in your  
6 particular case, when it came to the investigation of  
7 Deepwater Horizon, the SUBSAFE program was pointed out  
8 as a model of an organization that successfully operates  
9 a high-risk program. But do you have any insights on  
10 how you go about changing a safety culture that's an  
11 existing safety culture that's very different than the  
12 SUBSAFE program?

13 It seems like the Navy has had some benefit from  
14 getting it right at the beginning. I mean, you have  
15 Thresher, of course, but then you created a very -- it  
16 sounds like a SUBSAFE program that was very well  
17 conceived, and, you know, other programs and naval  
18 reactors, but what if you're faced with making  
19 suggestions to an organization that has a very  
20 entrenched existing culture but from your perspective  
21 isn't what you need in order to provide the kind of  
22 safety to ensure the mission?

23 REAR ADMIRAL ECCLES: Right. Well, so in the  
24 SUBSAFE program, 50 plus years does sound like a pretty  
25 good record, and I don't want to take anything away from

1 that, but in the 50 years preceding that, there were a  
2 lot of really daring people in those earliest days about  
3 100 years ago willing to lock themselves into a  
4 windowless tube and take it under water, especially  
5 given that in the century or two before that, there had  
6 been very few successes from all of that, right?

7 So, submarining, right off the bat, starts  
8 sounding in its earliest days like a very high-risk  
9 venture, and it certainly didn't have the basic tenets  
10 of the Submarine Safety Program, because there hadn't  
11 even been enough experience to start drawing conclusions  
12 like the ones drawn in the early '60s and into the '70s  
13 and '80s for SUBSAFE, and I would say there's probably a  
14 very similar story in aviation.

15 Most of us would probably not be the one to  
16 first try to land on the deck of a pitching ship,  
17 Admiral Norton excluded because he did do that, but the  
18 first one who did that has got to be a little like the  
19 first one who ate an oyster, right? There's a certain  
20 trepidation.

21 So, if you ask yourself, how do people with an  
22 engrained culture, or people who are taking something on  
23 who have never taken it on, try to get to a place where  
24 they can build such a system that has a likely  
25 successful outcome over a long time. I think that you

1 have to decompose the problem into individual pieces  
2 that you can then examine in really clear ways.

3 Like it is easy to explain to someone on their  
4 first day on a job that we have a program that only has  
5 two things it's trying to achieve: Prevent flooding in  
6 submarines; and then make it so that if the submarine  
7 does flood, you can recover that submarine to the  
8 surface.

9 I can explain that, and have, to children, very  
10 successfully. You can do it at the worker level. You  
11 can tell your mom and dad about it. It's not  
12 complicated. And then in similarly articulate ways, we  
13 can take the pieces of that, break it down and say,  
14 well, look, it depends on getting the right material  
15 properly installed in the right place, and that sounds  
16 easy. The systems that achieve that are very  
17 complicated, but really, at their core, there's a simple  
18 construct that we're trying to achieve, and we do it by  
19 breaking the program and the process down into its  
20 elements.

21 So, I think that, for example, in the energy  
22 industry, if there had been a question asked the day  
23 that the Deepwater Horizon had that problem, we're out  
24 here -- there were executives on the platform giving a  
25 safety award that day, as you may know just from reading

1 the papers, and it was a slips, trips and falls kind of  
2 safety award, and that's important in an environment  
3 where slips, trips and falls can be fatal, but it is not  
4 the whole picture.

5 And a question I guess would be, is there a way  
6 that team of executives, having finished giving those  
7 awards, would have had the thought and conversation, so  
8 what are we doing about systemic risk, and what are we  
9 doing about the highly complex operation that's going on  
10 down below the sea floor and managing all the energy  
11 that we're tapping into, because they're essentially  
12 taking a household plug and plugging it into a really  
13 powerful source.

14 So, how well is that going to go, how well do  
15 they understand the process, and do the people here on  
16 the rig have everything it takes to make local  
17 decisions, or are decisions being made at the  
18 appropriate level by the appropriate people with the  
19 appropriate tools and knowledge?

20 And I think if they had asked that question that  
21 day, before everything went badly, they might have found  
22 some things lacking, and I think it's been pretty well  
23 documented what many of those are. You could take a  
24 similar question without the big catastrophic event and  
25 just ask the question similarly, if I went into this

1 factory where this downside effect is possible, and has  
2 perhaps never occurred, what's being done today to frame  
3 that proposition that we must avoid that catastrophic  
4 event, or whatever the family of catastrophes is, how is  
5 that being articulated, made plain to everybody at any  
6 level that can influence the outcome, and how is it  
7 being instilled as a basic part of what they do every  
8 day?

9 I don't know that that's common. I don't think  
10 it's typical. I think that you can find it in many  
11 places. For some reason aviation safety is pretty darn  
12 good in America right now, and generally around the  
13 world. This is actually, despite some of what you've  
14 read about in the papers, this is a safer year in  
15 aviation safety, as I understand it, than the last ten.  
16 So, there's something going on right there. How do we  
17 take those kinds of things and extend them into places  
18 where maybe that discussion isn't happening every day?

19 DR. WINOKUR: I'm just trying to get some  
20 insight into how you manage a work force that could be  
21 very resistive and just simply say, we always have done  
22 it that way? I mean, that's the way we do things around  
23 here. How do you get the light to go on that they need  
24 to make changes?

25 REAR ADMIRAL ECCLES: Yeah, well, it is like

1 swimming upstream, I'm sure in many cases, but if you  
2 can make that proposition that what you're trying to  
3 achieve is something that is clear and it's simple and  
4 it affects their individual lives, then I think that  
5 individuals can relate to that.

6 Now, if they've never had the bad thing happen,  
7 then certainly there's maybe some difficulty convincing  
8 people that the risk is present. In my experiences, as  
9 in most places where we deal with a lot of risk, there  
10 are at least small pieces of that that have been  
11 presented, and you might not have blown the whole end  
12 off of a building, but you probably had people hurt.

13 So, how do you talk about those cases and make  
14 them real for the people who are nearby but not directly  
15 affected? And I think that's a communications  
16 challenge, and I think it has a lot to do with how  
17 leaders frame the thing they're trying to achieve. It  
18 has to do with clear articulation and simple statements,  
19 and I do think that the more we make that complicated,  
20 the less we win the troops over, whether those troops  
21 are in uniform or not.

22 DR. WINOKUR: Thank you.

23 Mr. Sullivan?

24 MR. SULLIVAN: So, what did the Navy do for its  
25 contractors to make sure that they had the right

1 mindset? I mean, we could talk about contract law, but  
2 that's pretty cumbersome. I know you mentioned earlier  
3 General Dynamics. You can't really threaten to take the  
4 business away from them because there's only so many  
5 places you can go to build a submarine, so what did the  
6 Navy do in order to make sure the contractors had the  
7 right mindset?

8 REAR ADMIRAL ECCLES: Right. I think that most  
9 of the same things that were being done inside the Navy  
10 from the beginning of this program, the SUBSAFE program,  
11 to today has been done in a very similar way that is  
12 sort of an emotional and intellectual attachment of the  
13 program's goals, its objectives, and then the how of the  
14 program.

15 That has been laid out for people who are on  
16 private sector payroll just as for Navy civilians and  
17 uniformed sailors from the operators who are really  
18 facing the risk each day, to the people who are perhaps  
19 sitting in a building doing the design for the next  
20 thing.

21 And they might be the furthest removed, perhaps,  
22 or from a subcontractor who's busy making a valve  
23 somewhere in Pennsylvania, but may not ever get to see  
24 that valve installed, and certainly is unlikely to sail  
25 in the ship.

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1           That connection is one that I think has been  
2           made by a combination of the big precipitous event, the  
3           calamity when it happened was real news, and it was  
4           something that I think people found easy to embrace 50  
5           years ago.

6           Then you'd carry it forward, and part of what's  
7           been done is a messaging process in the training, and  
8           this is just as true on the private sector side as  
9           public sector, that for a long time, family members and  
10          people who are like design leaders in the shipyards  
11          where the decisions had been made, people who survived,  
12          even a few people I've known who were supposed to have  
13          been on the sailing list, but for one reason or another  
14          did not make the trip, and would have been lost and then  
15          weren't, these individuals, when they, you know,  
16          realized the depth of the tragedy and the closeness of  
17          their personal connection, they became very, very  
18          forceful spokespeople for how important it is to never  
19          let it happen again.

20          So, since many of those people would be a  
21          hundred or more years old now, there has been a process  
22          of building living histories from those folks, using  
23          technology now to make it so that web-based training  
24          that people receive on their first day and that they  
25          receive annually thereafter, in some cases we do it a

1 little bit differently in the cycle, but you listen to  
2 people who were there then. You listen to adults who  
3 lost their dads. You listen to people who work in a  
4 shipyard now but are the children of someone who was  
5 lost in Thresher. And those kinds of people have a way  
6 to express things that you just never really lose track  
7 of.

8 And I think that we can make an impression in a  
9 valve manufacturer in Pennsylvania just as easily as on  
10 -- inside the USS name-the-sub by using those kinds of  
11 connections.

12 And then the contract law piece of it, not to  
13 get into any of that because you'll whip me on this one,  
14 but what we really do is we just simply make it a  
15 non-negotiable mandate that the system and the  
16 authorities and accountability that go with it, that  
17 that system transcends private and public sector.  
18 Everybody has got to toe the line, and there is a  
19 disciplinary consequence to not performing.

20 MR. SULLIVAN: Thank you.

21 REAR ADMIRAL ECCLES: Thank you.

22 DR. WINOKUR: Thank you.

23 Ms. Roberson?

24 MS. ROBERSON: Yes. Just one follow-up  
25 question. I was going to ask you, the way I understood

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1 your comments earlier about the effect on the contractor  
2 work forces, you really don't see a difference, either  
3 in mission commitment or in the culture of safety.

4 REAR ADMIRAL ECCLES: Right.

5 MS. ROBERSON: So, on the National Academy of  
6 Engineering effort for Macondo well blowout, what did  
7 you see in that arena?

8 REAR ADMIRAL ECCLES: That's a great question.  
9 I think the people who are out there on the platforms  
10 are every day dedicated to doing the job right and  
11 coming home to their families at the end of that period,  
12 and, of course, they don't come home every day. They're  
13 often out there for several weeks, and then home for a  
14 time, and then back out, so they do this on crew/off  
15 crew kind of thing.

16 Some of those crews seem very, very tight. And  
17 I went out there to visit with crews on nearly identical  
18 rigs, and spoke with them about that camaraderie and  
19 about the sense of watching out for each other, and they  
20 certainly are in a dangerous environment, whether  
21 they're plugged into the energy source or not, because  
22 they're also living out in seas that are sometimes  
23 pretty unforgiving, and their job is to stay put, too.  
24 They don't usually just outrun a storm. You know, the  
25 storms kind of hit them.

1           So, the people are not unafraid of managing  
2 these kinds of things, and they do watch out for each  
3 other, but when you look at it at a more corporate  
4 level, I saw differences between the major energy  
5 companies and their commitment to investing to put the  
6 right connections in place. In one company you might  
7 find that the expectation was the people on the rig have  
8 got it, and they'll call us with status and they'll let  
9 us know if they're in trouble, but, you know, of course,  
10 in the particular event that was the Macondo well  
11 disaster for Deepwater Horizon, those calls weren't made  
12 or recognized to be made until everything was going to  
13 hell.

14           But if you would take it from a different  
15 company's perspective, there are several others where  
16 it's likely that the same conversations that were done  
17 only locally on the rig would have been done across a  
18 net connection to the beach, and on the beach would have  
19 been a greater depth of knowledge base, and maybe a more  
20 senior decision-making level that could feel a little  
21 less encumbered by the pressure to get going, meet the  
22 schedule, because that pressure was -- any company's  
23 capable of exerting a lot of it, but if you never give  
24 it any relief, then it really does build.

25           And, so, a relief process would be to take

1 decisions and kick them up the chain to someone who is  
2 actually entitled to say, today I won't produce because  
3 today there is something I don't understand about what's  
4 going on down there on the sea floor, and or a mile or  
5 two below it.

6 In my opinion, the people in the Macondo case,  
7 at the Deepwater Horizon, didn't have that outlet, and  
8 if they had had that kind of an outlet, if they -- or if  
9 the investment had been made upfront to have a decision  
10 process and the equipment that goes with it so that they  
11 could take robust challenges and meet them with robust  
12 knowledge and make an executive decision at a level far  
13 above what's normally out on the rig, then I don't think  
14 they would have gotten the same outcome.

15 MS. ROBERSON: Okay. Thank you. One last  
16 question, Mr. Chairman.

17 DR. WINOKUR: Sure.

18 MS. ROBERSON: The Navy has a well understood  
19 hierarchy of rank and seniority, strong culture of  
20 discipline and obedience, a well-defined process for  
21 succession planning, and well-developed leadership  
22 training and educational programs, and we've talked a  
23 lot about those today, and those are kind of embedded in  
24 the culture.

25 And Admiral Norton has talked about it at the

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1 corporate level and his own experience, so I guess I  
2 wanted you to just talk about sometimes we hear if you  
3 don't follow these rules, you're out.

4 REAR ADMIRAL ECCLES: Right.

5 MS. ROBERSON: And I think there's often a lot  
6 of investment made, so I guess I want to ask you at the  
7 operational level, what kinds of positive or negative  
8 incentives did you use to change behavior?

9 REAR ADMIRAL ECCLES: Well, I think the story  
10 that was given in the aviation example of the sailor who  
11 was willing to take the XO's airplane and say, I don't  
12 think you're flying today, even though he might have  
13 come out of boot camp the night before, or some time  
14 like that, that was truly a sailor whose example was  
15 excellent, and calling him out and rewarding him for it  
16 was the right thing.

17 It's hard for me to put my finger on an exact  
18 example of that, but I've seen dozens of cases where  
19 whether sailors or shipyard workers, public or private,  
20 there have been similar happenstances where it took guts  
21 to say, this isn't right. And in so identifying it, a  
22 person took individual risk, maybe risk that they were  
23 afraid could actually result in termination or  
24 reassignment or something like that. And in so doing,  
25 when well led, they had been rewarded for making the

1 right call, usually by simple acts of recognition. The  
2 Navy Achievement Medal or a certificate to an individual  
3 or the ability to just say well done from a foreman to a  
4 crew. That kind of positive incentive is all it takes.

5 We do not need to try to put money in place to  
6 get people to do the right thing when it comes to  
7 safety, in my opinion, and, frankly, I think there would  
8 be too much downside risk to create some kind of  
9 mercenary reward for doing the right thing. So,  
10 sometimes right is just right, and an 'attaboy is all  
11 that ought to be required.

12 On the other side of it, a failure to comply is  
13 something that needs to be remedied, but, you know,  
14 making a mistake can run a real gamut, from malpractice  
15 to a person who's still learning, and I've certainly  
16 made a few mistakes and been lucky enough to work for  
17 people who said -- even one where I made a big mistake  
18 with a ship and I put it in the wrong place in dry dock,  
19 and there was some adverse consequences to that, and I  
20 went up to explain myself, and my boss, a captain at the  
21 time, decided that he had heard everything he needed to  
22 hear, and he said, that's it, you're dismissed, and I  
23 didn't really want to leave because I was pretty sure he  
24 left out the part where I get fired from that position.

25 And I mentioned that to him. He says, why would

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1 I fire you? And I said, I thought I just went through  
2 that. And he says, yeah, but you're the only guy at  
3 your pay grade who's actually made that mistake here,  
4 and if I give this job to those other guys, anything  
5 could happen. Are you going to make that mistake again?  
6 I said, no, sir, not that mistake. You know, I  
7 didn't -- I wasn't smart enough to realize I had some  
8 other ones I was yet to make, but he had the trust and  
9 confidence to go take somebody who has made a mistake  
10 and might learn from it and put him back to work.

11 And we can do that, but we have to be able to  
12 understand the difference between learning and trusting  
13 versus finding somebody who needs to get a different  
14 message, and sometimes that message is separation, but  
15 other times the message is something much more like  
16 something Admiral Norton talked about. When we've got  
17 an individual who meant to do the right thing and that  
18 the wrong thing resulted, then a re-education process  
19 might just mean that your qualification to do that thing  
20 you were just doing is suspended, and you need to earn  
21 it back. And, in fact, you're going to have some  
22 incentives to earn it back because you're going to do an  
23 awful lot of push-ups between here and being ready to  
24 get qualified again, but you need to go get re-educated,  
25 you need to go through some training, an examination,

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1 and then come back, and we'll let you have the keys  
2 again.

3 And I think that systems like that work really  
4 well in the public and the private sector, and I have  
5 now employed them in both sectors. And I did have  
6 somebody say to me early in my new private sector career  
7 where I became the boss of some stuff that this isn't --  
8 he said, this isn't the Army, we don't follow orders  
9 around here. And I said, well, I know it's not the  
10 Army, but you're damn sure going to follow some orders.

11 And it turns out -- well, not everything is  
12 given by decree. It is not so different in all our  
13 different parts of life that when the most important  
14 things are required, then that requirement has to be  
15 followed, and when it's followed well and good things  
16 happen, people should be rewarded, and when there's a  
17 deviation, then we need to deal with the deviation and  
18 figure out why and what we do about it and self improve.

19 MS. ROBERSON: Thank you.

20 REAR ADMIRAL ECCLES: Thank you.

21 DR. WINOKUR: Just a couple of very brief  
22 questions to end. I wanted to just ask you briefly  
23 about complacency, and do you think there's a cyclic  
24 component to where every 20 or 30 years you get a new  
25 corps of officers and they become more distant from

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1 events that you grew up with and you understood. Could  
2 be wars, could be accidents, things of that nature, and  
3 how you go about overcoming that and making sure you are  
4 moving in the right direction?

5 REAR ADMIRAL ECCLES: Right. I mean, if I think  
6 about us as having been about the same age and coming in  
7 the Navy in the same era, we probably have certain  
8 shared traits, whether one was in submarines and one was  
9 flying because we're just products of our time.

10 On the other hand, you know, our flow of  
11 officers and enlisted into the Navy, just as in the  
12 workplace, is somewhat continuous, and yeah, there are  
13 ups and downs, you know, and yeah, we have these bimodal  
14 distributions of age in some workplaces, but by and  
15 large, what we're doing is continually working on the  
16 process of educating, training, sustaining, and I think  
17 that we can overcome any sense of cyclic forgetfulness  
18 through that.

19 I do not have the sense that there is an  
20 interval of 20 or 30 years over which we forget things.  
21 I think that if we don't pay attention to things, it  
22 takes much less than that to forget, and when we do pay  
23 attention, I think we can achieve a nearly continuous  
24 awareness, if we're doing it right, but that's a  
25 leadership challenge. How do you do that when you're

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1 retiring people who were there, and part of the answer  
2 might be, let's get some of them to put that testimony  
3 into a format where we can show it 100 years from now if  
4 we have to.

5 DR. WINOKUR: Thank you.

6 Mr. Sullivan?

7 MR. SULLIVAN: I want to ask actually a question  
8 for both of you, maybe you can take turns answering, but  
9 the injection of new technology, Admiral Norton, you  
10 talked earlier about night vision goggles and the effect  
11 that that has, but the other day I was down at a --  
12 visiting Pantex where the NNSA puts together and takes  
13 apart nuclear weapons, and I was supposed to meet up  
14 with my escort at a particular place to get taken  
15 somewhere, and we had a miscommunication, and so we  
16 weren't in the same place.

17 And because they had taken my cell phone away  
18 from me, I was like at a loss, all of my ability to  
19 reach out to this person was now gone. So, the point is  
20 there's always a downside, right? Through my career,  
21 navigation systems improved, that was great, but there  
22 were old things that we had learned back when we had to  
23 look at the stars that helped us make sure the  
24 technology was working.

25 Can you speak to the I would call it, and this

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1 is just my opinion, there's somewhat of a double-edged  
2 sword, technology is always -- you always want it, but  
3 there's always some downsides. Can you speak to that  
4 and how the Navy deals with it? Maybe Admiral Eccles,  
5 you want to go first?

6 REAR ADMIRAL ECCLES: Yeah, let me just take a  
7 quick shot at that. I mean, certainly there are some  
8 things where we need to be able to work in directions  
9 that are very progressive, by keeping in mind these  
10 downsides. There are other places where we should be  
11 much more conservative and ask the question, why must I  
12 change or when will this thing that seems promising  
13 prove its utility, and we'll deal with what the downside  
14 is successfully enough that we'll let it displace what  
15 it used to do.

16 And, so, I think there are a lot of examples of  
17 places where highly reliable components and highly  
18 reliable system approaches have not been shifted until  
19 the technology that was present had matured a lot  
20 somewhere else and where risks are lowered, before we  
21 adapted and adopted these things into higher risk  
22 environments. And maybe also part of the math in this  
23 is, so how big is the benefit?

24 So, for example, in submarines, there's a  
25 fly-by-wire kind of technology being employed today, and

1 really for the last decade or so, but not much before  
2 that, where instead of using hydraulics to move our  
3 control surfaces that change the attitude of the  
4 submarine under water. We always used hydraulics, and  
5 then airplanes really sticks with wires and pulleys  
6 would be the analogy, and now both have moved in a  
7 direction toward sending telemeterized signals from  
8 processors near the stick to processors and actuators  
9 back at the control surface.

10 If you asked an old-time person, are you going  
11 to let somebody send photons or electrons back and forth  
12 to give the command, or are you just going to trust in  
13 that wire or in that hydraulic pipe, most of the  
14 traditionalists would say, you better not give up the  
15 wire or the hydraulic system very fast, and most of them  
16 would also say, I want to see a lot of redundancy built  
17 into whatever that path is that sounds to me fragile.

18 So, we engineer more redundant systems, and now  
19 F-18s and lots of other airplanes are flown with  
20 fly-by-wire systems, and adopted it faster than the  
21 submarines did, even though they go a heck of a lot  
22 higher and faster and all of that, high-risk  
23 environment, but the payoff for doing things lightweight  
24 and highly responsive, the way that technology was, had  
25 a more immediate transactional value to the aviation

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1 side than doing that in a big submarine did.

2 But it turns out to be a good thing in  
3 submarines, too, but we had to get to where we could  
4 build the faith, build the confidence, and we built it  
5 through observation of other places that were embracing  
6 it and having to deal with some of these same risks.

7 So, I think sometimes we need to be a bit slow  
8 about this. That said, I'm really glad I have the  
9 iPhone I carry today and not the lousy BlackBerry I had  
10 a year ago.

11 REAR ADMIRAL NORTON: The -- it's an interesting  
12 comment. You talked about shooting the stars, celestial  
13 navigation, even aboard with the GPS systems we have the  
14 radar systems we have, the connectivity we have, it was  
15 fun for me to watch my -- the ship's navigator and also  
16 the quartermaster actually still go up and do celestial  
17 navigation just to keep those skills up, so that's still  
18 going on out there at least on the big decks, on the  
19 aircraft carriers, et cetera.

20 For the young sailors, the young quartermasters  
21 to reach their quals, they still rely on those things.  
22 Fortunately for me, I never had to rely on that, I  
23 always had my GPS and the radar systems, et cetera, and  
24 we still shoot fixes when we get close to -- using  
25 nav aids when we get close to shores, et cetera, but,

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1    yeah, out there in the deep kind of blue water ops,  
2    relying on celestial navigation it's more of an art than  
3    it is a science right now.

4            Yeah, we do rely on technology now, and I agree  
5    with what Admiral Eccles says concerning the fly-by-wire  
6    systems that we have, the night vision goggles, et  
7    cetera. Ultimately we rely on some of the old  
8    techniques. I can speak certainly from the cockpit,  
9    even though we had night vision goggles, there were many  
10   nights that to practice our instrument flying skills, we  
11   would flip those up.

12           We would actually put hoods on so all we could  
13   read was our instruments on the panel in front of us,  
14   and so we would keep those skills. So, we still have  
15   requirements to go back to what I would call the basics,  
16   if we're going to fly in instrument flight conditions.  
17   So, it's not in lieu of or we no longer do those type of  
18   things. We use the technology to -- in the correct  
19   environments, and mostly they're in the landing zones or  
20   on the back ends of ships, et cetera, but there --  
21   certainly have, in my opinion, have saved probably  
22   untold lives and certainly equipment over the years  
23   because of those technologies that are out there.

24           MR. SULLIVAN: Thanks to both of you.

25           DR. WINOKUR: One final question, Admiral

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1 Eccles. We're interested in DOE safety culture. It's  
2 DOE safety culture or culture of safety, it's not the  
3 Board's, but we're an oversight organization. Do you  
4 have any ideas about how we can effectively assist the  
5 Department of Energy in providing some benefit to their  
6 desire to improve their safety culture over time?

7 REAR ADMIRAL ECCLES: Yeah, that's an  
8 interesting question whose answer I'm sure I don't  
9 really have great -- a great way to give to you because  
10 I've been a part of oversight organizations, but not as  
11 distinctly separated as this construct is.

12 Instead, usually what I was looking at is  
13 something like the people who are a part of a process in  
14 operationalizing something, then take some level of  
15 executive managers or leaders and make an oversight  
16 entity out of that and have the operational folks report  
17 on a periodic basis the status of things to that  
18 oversight group.

19 That's much less of a live connection than the  
20 one I might infer from your question, but if you accept  
21 the idea that that's more of a periodic check-in and a  
22 steering question, are we doing what we said we would  
23 do, are we achieving the kinds of ends that we intended  
24 to achieve, and if not, what are we doing about it.  
25 That kind of an oversight board has very little

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1 operational connection but can still hold value in that  
2 kind of a way.

3 And that's what I would imagine you already have  
4 as a relationship, but I don't have familiarity with the  
5 DOE, Defense Nuclear Facility Safety Board relationship  
6 to be able to comment on how strong or not that is.

7 DR. WINOKUR: All right. Thank you very much.

8 REAR ADMIRAL ECCLES: Thank you.

9 DR. WINOKUR: So, I want to thank you, Admiral  
10 Eccles, and I want to thank both of our panelists,  
11 Admiral Norton and Admiral Eccles, for your valuable  
12 insights into the safety practices and tools that the  
13 Navy is using to improve or sustain a robust culture of  
14 safety, both in operations and in the design and  
15 construction of nuclear submarines.

16 At this time, it is the Board's practice to  
17 provide an opportunity for comments from interested  
18 members of the public. We will offer a similar  
19 opportunities at the end of this afternoon's session,  
20 and it's my understanding is there are no members of the  
21 public or our audience today who wish to comment, but I  
22 do want to ask again, is there anybody in the audience?  
23 Yes, please? Let's get a mic.

24 Thank you very much.

25 (Brief discussion off the record.)

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1 DR. WINOKUR: I think we're just going to  
2 entertain comments. I don't think you're going to  
3 question the panelists, but if you have thoughts or  
4 comments you'd like to share, please do that.

5 MR. SINHA: Hi, so my name is Ashish Sinha with  
6 the Alliance for Nuclear Accountability. So, the  
7 overall just thing, I think, that I was interested in  
8 and to consider was in the wake of the Air Force's  
9 recent challenge with cheating, Admiral Kirby had  
10 mentioned about his concerns about systemic problems  
11 with low morale within the nuclear mission, and so one  
12 of the things that I have been wondering about is that,  
13 is there a correlation between personnel's value of both  
14 their mission and work on their willingness to support a  
15 robust safety culture, and how do we guard against that  
16 if there is that sort of correlation?

17 DR. WINOKUR: I want to thank you for that  
18 comment, I appreciate it. That's something that  
19 certainly we'll be thinking about as we go about these  
20 investigations. Thank you.

21 MR. SINHA: Thank you.

22 DR. WINOKUR: Are there any other comments from  
23 the members of the audience today?

24 (No response.)

25 DR. WINOKUR: All right, thank you very much,

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1 then. At this time, I will recess this meeting and  
2 hearing for lunch. I will hold my closing remarks and  
3 ask other Board members to hold their closing remarks  
4 until the end of this afternoon's session.

5 Once again, I would like to thank our two  
6 witnesses for supporting this session. The Navy has  
7 clearly put significant amount of effort and resources  
8 into understanding the concept of safety culture and  
9 improving their operations based on that understanding.

10 We appreciate the insights into those efforts  
11 that our two witnesses have provided today. I want to  
12 thank members of the public, Congressional staffers,  
13 elected officials, and other representatives of state  
14 and local organizations who may have been present this  
15 morning or observed our webcast. I invite all of you to  
16 return for this afternoon's session, which promises to  
17 be and interesting and inform -- which promises to be as  
18 interesting and informative as this morning's session  
19 has been.

20 This meeting and hearing is now in recess until  
21 1:00 p.m. Thank you.

22 (Whereupon, at 11:51 a.m., a lunch recess was  
23 taken.)

24  
25



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1 health and safety mission throughout the Department of  
2 Energy's defense nuclear complex, the Board is recording  
3 this proceeding through a verbatim transcript, video  
4 recording and live video streaming.

5 The transcript, associated documents, public  
6 notice and video recording will be available for viewing  
7 in the public reading room here at headquarters in  
8 Washington, D.C. In addition, an archive copy of the  
9 video recording will be available through our website  
10 for at least 60 days.

11 Per the Board's practice, and as stated in the  
12 Federal Register notice, we will welcome comments from  
13 interested members of the public at the conclusion of  
14 testimony, which will be at approximately 4:00 p.m. A  
15 list of those speakers who have contacted the Board is  
16 posted at the entrance to this room. We have generally  
17 listed the speakers in the order in which they have  
18 contacted us, or if possible, when they wish to speak.

19 I will call the speakers in this order and ask  
20 that speakers state their name and title at the  
21 beginning of their presentation. There is also a table  
22 at the entrance to this room with a sign-up sheet for  
23 members of the public who wish to make a presentation  
24 but did not have an opportunity to notify us ahead of  
25 time. They will follow those who have already

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1 registered with us in the order in which they have  
2 signed up.

3 To give everyone wishing to make a presentation  
4 an equal opportunity, we ask speakers to limit their  
5 original presentations to five minutes. I will then  
6 give consideration for additional comment, should time  
7 permit.

8 Presentations should be limited to comments,  
9 technical information and data concerning the subjects  
10 of this public meeting and hearing. The Board members  
11 may question anyone making a presentation to the extent  
12 deemed appropriate. The record of this proceeding will  
13 remain open until September 27th, 2014.

14 I would like to reiterate that the Board  
15 reserves its right to further schedule and regulate the  
16 course of this meeting and hearing to recess, reconvene,  
17 postpone or adjourn this meeting and hearing and to  
18 otherwise exercise its authority under the Atomic Energy  
19 Act of 1954, as amended.

20 This public meeting and hearing is the second of  
21 a series of hearings the Board will hold to -- convene  
22 to address safety culture at Department of Energy  
23 defense nuclear facilities and to address the Board's  
24 Recommendation 2011-1, Safety Culture at the Waste  
25 Treatment and Immobilization Plant. Later hearings will

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1 be announced by separate notices.

2 In this hearing, the Board is holding two  
3 sessions. In this morning's session, the Board received  
4 testimony from current and former Navy officers with a  
5 focus on safety practices and tools that the Navy uses  
6 to improve and sustain a robust culture of safety, both  
7 in operations and in the design and construction of  
8 nuclear submarines.

9 In this afternoon's session, the Board will hear  
10 testimony from a panel composed of a member of the  
11 United States Chemical Safety and Hazard Investigation  
12 Board, and two experts in human and organizational  
13 factors in management of high reliability organizations.

14 The panel will discuss the role of the  
15 organizational leaders in establishing and sustaining a  
16 robust culture of safety within organizations conducting  
17 complex and hazardous operations.

18 In a follow-on session later this fall, we will  
19 discuss with officials from the Department of Energy how  
20 these approaches and lessons learned might be used to  
21 guide their efforts in continuing to assess and improve  
22 safety culture at the Department's Defense Nuclear  
23 Facilities.

24 This concludes my opening remarks. I will now  
25 turn to the Board members for their opening remarks.

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1 Ms. Roberson?

2 MS. ROBERSON: I have no statement at this time,  
3 Mr. Chairman.

4 DR. WINOKUR: Mr. Sullivan?

5 MR. SULLIVAN: No, Mr. Chairman.

6 DR. WINOKUR: This concludes the Board's opening  
7 remarks. At this time I'd like to invite our three  
8 panelists to the witness table for this session. I  
9 notice you're already there. Each witness will be  
10 provided 25 minutes to make a presentation that  
11 addresses some of the initial lines of inquiry provided  
12 by the Board in advance of this hearing. The Board will  
13 then question each witness.

14 Our first witness is the Honorable Mark Griffon.  
15 Mr. Griffon was appointed by President Obama in 2010 to  
16 the United States Chemical Safety and Hazard  
17 Investigation Board, also referred to as the Chemical  
18 Safety Board.

19 Prior to that appointment, Mr. Griffon served as  
20 a member of the Federal Advisory Board on Radiation and  
21 Worker Health, which advises the Department of Health  
22 and Human Services on occupational illnesses and  
23 compensation policy. Mr. Griffon's career has included  
24 work in academia, the public sector and the private  
25 sector.

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1           The Chemical Safety Board is an independent  
2 Federal agency with a mission of investigating  
3 significant chemical incidents and hazards, and  
4 effectively advocating the implementation of  
5 recommendations to protect workers, the public and the  
6 environment.

7           The Chemical Safety Board primarily conducts  
8 root cause investigations of chemical accidents at  
9 industrial facilities, but they also -- but they are  
10 also authorized to conduct investigations of chemical  
11 hazards, regardless of whether an accident has already  
12 occurred. Some of the significant investigations  
13 performed by the Chemical Safety Board during Mr.  
14 Griffon's term include the Deepwater Horizon explosion  
15 and fire, the Tesoro refinery fire and the West Texas  
16 fertilizer plant explosion and fire. All of these  
17 accidents resulted in significant loss of life and  
18 property.

19           Given the mission of the Chemical Safety Board,  
20 it could be said that Mr. Griffon sees organizations at  
21 their worst rather than at their best. With that in  
22 mind, Mr. Griffon will provide his perspective on the  
23 role that organizational leaders play in either  
24 contributing to the occurrence of accidents, or in  
25 responding to them, and perhaps share some ideas on how

1 leaders can help prevent accidents.

2 Our second witness is Dr. Najmedin Meshkati from  
3 the University of Southern California. Dr. Meshkati is  
4 a professor of civil environmental engineering and a  
5 professor of industrial and systems engineering. For  
6 the past 25 years, he has been teaching and conducting  
7 research on risk reduction and reliability enhancement  
8 of complex technological systems, including commercial  
9 nuclear power, aviation, and the petrochemical and  
10 transportation industries.

11 Dr. Meshkati has inspected many petrochemical  
12 plants and nuclear power plants around the world,  
13 including the Chernobyl Nuclear Power Station. Dr.  
14 Meshkati was the Technical Advisor for the National  
15 Academy of Sciences Committee on Lessons Learned from  
16 the Fukushima nuclear accident for improving safety of  
17 U.S. nuclear plants.

18 Prior to that, he was a member of the National  
19 Academy of Engineering, National Research Council  
20 Committee on the Analysis of Causes of the Deepwater  
21 Horizon explosion, fire and oil spill, to identifying  
22 measures to prevent accidents in the future.

23 He also serves as a consultant to both the  
24 National Transportation Safety Board and the Chemical  
25 Safety Board. Dr. Meshkati obviously brings a wide

1 range of experience to this meeting, but two of his most  
2 recent activities are of direct interest to this Board;  
3 namely, evaluations of the Deepwater Horizon accident  
4 and the lessons learned from the Fukushima Daiichi  
5 accident.

6 Dr. Meshkati will discuss his perspective on the  
7 influence that organizational leaders can have on the  
8 success or failure of the organization to respond to  
9 situations that challenge or exceed the design basis of  
10 the facility.

11 Our third witness is Dr. Kathleen Sutcliffe from  
12 the Johns Hopkins University. Dr. Sutcliffe is an  
13 organizational sociologist, and has recently joined the  
14 faculty at the Johns Hopkins Carey Business School as a  
15 Bloomberg Distinguished Professor. Prior to that, she  
16 was on the faculty of the Ross School of Business at the  
17 University of Michigan.

18 Dr. Sutcliffe's research has been devoted to  
19 understanding the fundamental mechanisms of  
20 organizational adaptation, reliability and resilience.  
21 She has focused on how top executive team composition,  
22 cognition and learning influence a firm's adaptability  
23 and performance on processes associated with team and  
24 organizational resilience and high reliability  
25 organizing, and on the social and organizational

1 underpinnings of mishaps.

2 Her explicit goal is to gain an understanding of  
3 how an organization's design contributes to its members'  
4 ability to successfully manage unexpected events.

5 Dr. Sutcliffe has studied and provided  
6 consultation to a wide range of organizations conducting  
7 hazardous operations, including the U.S. Forest Service  
8 wildfires, major oil companies, and healthcare  
9 providers.

10 From Board Member Griffon to Dr. Meshkati, we  
11 hope to learn how leaders influence the behavior of an  
12 organization and its likelihood of success when the  
13 organization is seriously challenged.

14 Dr. Sutcliffe will discuss with us her  
15 perspective on how organizational leaders can learn from  
16 such situations, and how they can work to improve  
17 themselves and their organization in order to be better  
18 prepared for future situations.

19 I am very pleased that these three distinct  
20 experts have agreed to be here and share their  
21 perspectives with us today. I look forward to their  
22 presentations and discussions.

23 We will begin the presentations with Board  
24 Member Griffon. Welcome.

25 MR. GRIFFON: Thank you. That's fine. Thank

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1 you, Dr. Winokur, and members of the Board. Thank you  
2 for inviting me here, and I have the distinguished  
3 opportunity of being the first speaker after lunch,  
4 which we always know is quite troublesome.

5 I also feel like I'm returning the favor here.  
6 Ms. Jessie Roberson was nice enough to come to a  
7 Chemical Safety Board hearing where she testified at our  
8 hearing on process safety indicators, and she was very  
9 helpful, and I appreciate that, and so I hope I can give  
10 some insights into what the CSB's done in our  
11 investigations and particularly focusing on safety  
12 culture.

13 I think you are right, our perspective coming in  
14 is more probably glass half full than -- or glass half  
15 empty, I guess we tend to see organizations at their  
16 worst, and we also have a bit of hindsight bias. We're  
17 looking at what went wrong after the fact, not trying to  
18 prevent going forward, although our recommendations are  
19 focused in that regard.

20 So, I am going to do a quick intro to how we do  
21 our work, and then try to get into a couple of the  
22 investigations that have involved safety culture, and  
23 the last several slides are going to focus on a lot of  
24 sort of challenges questions that I have, and I'm hoping  
25 that we'll engage the dialogue between you all and the

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1 whole panel, as I'm going to defer them on answers.

2 All right. First, my disclaimer. The only  
3 thing I really want to -- you know, this is our lawyers  
4 helping with this, but the important part for me as a  
5 board member is that I'm going to say quite a bit of  
6 information that's on the public record that's based on  
7 Board votes, and that's our process, similar to yours,  
8 is that our published reports are all voted on by the  
9 Board.

10 I'm also going to add into this presentation  
11 some of my own observations and views that aren't  
12 necessarily Board opinions at this point, but I think  
13 it'll will be helpful in creating a dialogue.

14 So, I don't know why this was laid out this way,  
15 but I'll just put it all up there. The CSB, I mean,  
16 we're a very small Federal agency. Most of you, I  
17 think, in this room, anyway, know us. Most of the  
18 audiences I go to don't know us, but we got funding in  
19 around 1998. Right now we have two Board members, we're  
20 supposed to have five. And we have about 45 staff, and  
21 maybe about 15 to 17, I think, of those are  
22 investigators.

23 We're modeled after the NTSB, but I often say  
24 that we're jealous of the difference in budgets. We --  
25 so, our intent is to look at root causes and make

1 recommendations toward prevention. Of course, we're not  
2 regulatory or and we don't have enforcement authority.

3 I think at this point, I added in this slide  
4 because I think it's important for people to understand  
5 how we go about our investigations, at least the more  
6 comprehensive investigations that we do, and this --  
7 since I've been on the Board, we sort of modified our  
8 protocol to include or to change this approach, and the  
9 top bullet, I'll read this out because I think it's  
10 important to understand. "Formal analysis to identify  
11 underlying technical, unifactor management system,  
12 organizational and regulatory causes of the incident."

13 So, the point being there is that we try to go  
14 beyond the widget that broke, beyond the worker error  
15 and ask, as someone earlier said, ask the whys, why did  
16 all this happen.

17 And, of course, we're also -- as we do this,  
18 we're looking at systems that were in place, but also  
19 the deltas between what management thought was going on  
20 versus what was actually going on.

21 And the other factor is why -- what conditions  
22 were present and what decisions were made that led up to  
23 the incident. So, we try to take that higher level look  
24 for causes.

25 I want to put this presentation into a context

1 of process safety and personal safety. This is a theme  
2 that has come up in several of our investigations, and,  
3 in fact, the two that I'm going to talk about, Macondo  
4 and Texas City, also have a component of this. And I  
5 think it's important as we get on to safety culture,  
6 too, so we're really dealing with two distinct  
7 disciplines, and on the one side, we have the attributes  
8 of one, prevention for process safety. We're looking at  
9 mechanical integrity, hazard evaluation, management of  
10 change, the risk -- while there might be fatality risks  
11 in both personal accidents and the more process safety  
12 accidents, the major accidents, the property damage, the  
13 environmental damage, the multiple fatalities usually  
14 occur on these sort of larger process safety incidents,  
15 so another distinction.

16 Also the indicators, I think, is very important.  
17 Personal safety, right now a lot of the indicators are  
18 recordable injury rates, days away from work, and I'll  
19 also note that these are some of the only indicators  
20 that are required for reporting for a lot of the  
21 companies that we cover. As you go into process safety,  
22 you might be looking at other releases to the air or  
23 more leading indicators to process events.

24 So, they're very different disciplines,  
25 different focuses, not to say one is important and one

1 is not, but they're very different.

2 So, starting with BP Texas City, obviously I  
3 think this is the incident that probably took -- put the  
4 CSB on the map. A lot of people followed this incident,  
5 and it involved a large hydrocarbon release, a vapor  
6 cloud went through the site, and there in the foreground  
7 is the trailer. Obviously the vapor cloud found an  
8 ignition source, and these temporary trailers with  
9 contractors in and around took the brunt of the  
10 explosion, 15 deaths and many injuries, 180 injuries.

11 This resulted in actually two different reports.  
12 The Chemical Safety Board did a report, but they also  
13 asked for Secretary Baker led a panel, which we refer to  
14 as the Baker report, to further look at organizational  
15 issues, including safety culture.

16 So, some key organizational findings out of  
17 this, I just picked some obviously, but the first one,  
18 personnel checked off safety procedures as done when  
19 incomplete, and I think the point I want to make here is  
20 that, you know, obviously we don't want to stop the  
21 investigation there, and it was clear that these  
22 work-arounds had been occurring for quite some time.

23 The other thing -- the other way you think about  
24 the systems, reward systems, reward and punishment  
25 systems is that oftentimes workers are almost

1 encouraged, albeit subtly, to do these work-arounds, to  
2 be more efficient to make the system work. It's only  
3 when the procedure fails when there's retaliation or  
4 punishment to the workers. So, there in this case they  
5 were, they were working around these procedures for  
6 quite some time, just never had an event, and this  
7 obviously in this case they had one.

8 The absence of reporting of abnormal situations  
9 for fear of blame, this is another finding of the  
10 report. The message just wasn't getting up the chain.  
11 No messages -- no emphasis on learning from mistakes to  
12 prevent worse incidents. They certainly had prior  
13 incidents. They even had internal audit reports that  
14 were warning signs that they should pay more attention  
15 to process safety, and yet these were not emphasized at  
16 all. And the last part is the internal surveys.

17 So, the Baker panel went further with this, and  
18 I'm just highlighting again some of their findings,  
19 ineffective process safety leadership, lacking an open,  
20 trusting relationship between management and the  
21 workers, and the contractors I'll add in there. There  
22 was a multiple dimension there.

23 A lack of unifying process safety culture, and  
24 I'll come back to that unifying thing later. And,  
25 again, personal safety emphasis versus process safety.

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1 They -- I think it was mentioned earlier from Macondo,  
2 there was a ceremony going on to reward a great safety  
3 record, the same thing that was happening pre-Texas  
4 City. They were getting an award for their very low  
5 lost time injury rates, and they were heavily relying on  
6 lost time injury rates to sort of be a predictor of  
7 major accidents, which is a fallacy.

8 And then there was a production versus safety  
9 component, too. Cost-cutting pressures seriously  
10 degraded the infrastructure. The maintenance budget I  
11 think was cut by 25 percent preceding this, and a lot of  
12 things that were waiting to be repaired were just put on  
13 hold longer, and so certainly a component.

14 They did, as a part of the Baker panel report,  
15 they did a safety culture survey, and some of the  
16 focuses of this, the attributes they were looking at,  
17 does the work force feel that they were empowered? Do  
18 they report safety-related incidents, process safety  
19 awareness, trust, information flow? Several of these  
20 are attributes that a lot of you are probably familiar  
21 with, but when you look at some of the survey items, and  
22 I just took a few snapshots off -- I'm not so good with  
23 my PowerPoint, but I took a few snapshots, and these are  
24 percentages that disagree with the question, the stated  
25 question. "I believe the culture exists at this

1 refinery that encourages raising process safety  
2 concerns."

3           You see Texas City and Toledo, but I think the  
4 importance is, I have three of these slides, they're all  
5 similar. I think the -- there's a bunch of stuff to  
6 look at and maybe ask more questions on, but one thing,  
7 Texas City, of course, has sort of worse scores in some  
8 regard, but I also point you to the differences between  
9 management, engineering and the workers essentially, the  
10 operators and maintenance people, and there's supposed  
11 to be a last line which is contractors, but it was cut  
12 off, but if you look to the report, you can find that.

13           The other thing that doesn't show up on this  
14 simple overhead is that Carson and Cherry Point were  
15 recent acquisitions by BP, so they might have had a  
16 different culture because they -- a lot of the people  
17 that were working there were under another operator  
18 fairly recently, but there's a lot of more drill-down  
19 that has to happen there to understand that.

20           Just another similar question: "Is management  
21 more concerned with correcting hazards than assigning  
22 blame or issuing discipline?" And, again, these are  
23 even higher disagrees on this, so there was really a  
24 focus or at least a perception by the operators and  
25 maintenance folks that they were going to assign blame,

1 which makes them very unlikely to report, right?

2 And when process safety is involved, can I  
3 challenge decisions made by the supervisors without fear  
4 of a negative consequence? Again, similar numbers.

5 So, they have a fairly lengthy survey of this,  
6 concluding in part that there were some problems with  
7 Texas City's, and BP's to some extent overall safety  
8 culture, or at least some challenges to improve.

9 And then fast forward to 2010, Deepwater  
10 Horizon, so this is about five years after for BP  
11 anyway. Of course, we don't want to forget that Trans  
12 Ocean and Halliburton, and there were some other big  
13 players involved in this incident. So, the incident has  
14 been described, people are well aware of this incident.  
15 We, the CSB, is still trying to complete -- did I say  
16 that on the record, trying to complete? We're going to  
17 complete our report on the -- on the investigation  
18 fairly soon, and we've put out one -- two volumes out of  
19 the three, I think, that are going to be the full  
20 report, but at this point we're still looking at those  
21 components of safety culture, organizational failures.

22 We've got a lot of information, but I'm  
23 probably -- I'm going to focus on -- there's so many  
24 other reports that are out there right now, that some of  
25 the slides I'll share with you are from these other

1 reports, and I think we're going to -- we do agree with  
2 most of these, anyway, that are up here.

3 The Presidential Commission Report Safety  
4 Culture, again, must be accompanied by sweeping reforms  
5 that accomplish no less than a fundamental  
6 transformation of its safety culture. When I read this,  
7 it also makes me think back to the Kemeny Report after  
8 Three Mile Island, the Presidential Commission report,  
9 where they also warned that the regulator and the  
10 industry have to have sweeping reform. I don't know if  
11 they used those same words, but essentially the same  
12 idea of the way they do their business, and they didn't  
13 use the words "safety culture" in that report, but, boy,  
14 rereading it, it certainly sounded like safety culture.

15 The Commission's Chief Counsel Report went a  
16 little further than the initial Presidential Commission  
17 Report, and they added some findings on this that these  
18 errors can lead back to management failures and  
19 decisions, management errors. They didn't fully  
20 appreciate all of the risks that Macondo presented, and  
21 I think that was discussed a bit earlier, too, and they  
22 didn't adequately supervise the worker and its  
23 contractors.

24 This is this notion of deference to expertise.  
25 They had the experts on shore. They weren't really

1 going to them. Part of it was the way they were  
2 organized and dealing with decision-making. This is  
3 related to the decision-making. They addressed one risk  
4 while increasing the overall risk profile. Again, this  
5 is from the Presidential Commission's findings. Failed  
6 to take full advantage of the shore-based expertise, and  
7 this is interesting to me, too, the overreliance on  
8 individual preferences and experience.

9 So, they were really dealing with the guys on  
10 the rig experiences on making these decisions and it  
11 almost -- at least we have some indications or questions  
12 about whether it led to sort of a group think atmosphere  
13 going on where they all kind of just -- no one really  
14 wanted to say no, and they just kind of proceeded that  
15 way, and never had problems doing it this way, so...and  
16 I think as was stated earlier in the morning panel, it  
17 might have been a good time for just a pause, talk to  
18 the onshore folks that didn't have those pressures and  
19 get sort of that secondary expertise or opinion.

20 I had to put a slide in for Dr. Meshkati. The  
21 National Academy of Engineering also did a report, and  
22 just to read the one, the lack of a strong safety  
23 culture resulting from deficient overall systems  
24 approach is evident in the multiple flawed decisions  
25 that led to the blowout, and they failed to appreciate a

1 plan for the safety challenges presented by the well.

2 So, again, not fully appreciating the risk.

3 I think the sense we also have is that there was  
4 a real focus on the commercial risk, but sort of an  
5 underestimation of the potential major accident hazard  
6 risk so that they viewed, leading up to the incident,  
7 the view was that well, if all else fails, we'll end up  
8 having to redo the cement job or we might lose a few  
9 days of production, which in offshore drilling is no  
10 little thing. Obviously a lot of money is being lost,  
11 but they weren't really thinking of the major accident,  
12 at least in the sense that it played out.

13 And, so, with those two in mind, I want to come  
14 back to this concept, the safety culture model, and this  
15 is adopted from the IAEA model where you have the --it's  
16 a circle diagram, and in the middle, of course, is a  
17 definition of safety culture, a lot of times thought of  
18 as the way we do things around here.

19 Outside of that is the values, which I list down  
20 here, and then the artifacts or symptoms are on the  
21 outer edge of that. And I just want to remention a few  
22 of these, because I think they're important. You know,  
23 the learning-driven concept, and the artifact is  
24 encourage reporting. Encourage reporting would arguably  
25 be a good thing, an improved safety culture.

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1           The thing I think you have to look at, though,  
2 is does management want the reports. The workers are  
3 smart enough to know if management really wants to hear  
4 this or if they don't. They also have to understand  
5 about retaliation, and so these are important things  
6 when looking at this learning-driven. It's easy to say,  
7 but implementing it is much harder.

8           The first one -- I skipped over the first one,  
9 that it's a recognized value, across the organization  
10 safety culture is a recognized value, and my comment is  
11 unified safety culture. I think this is been expressed  
12 before, that can you really expect to have a unified  
13 safety culture, especially in big organizations? You  
14 have contractors, you have unions, you have different  
15 unions. You have, so so -- and on Deepwater Horizon,  
16 many different organizations working together, perhaps  
17 with different cultures. Can they -- can they unify  
18 around some practices? That might be a different  
19 question.

20           Resiliency, I always say, you know, this is a  
21 challenge in the field that I'm working in in that it's  
22 low probability/high consequence, so it's a common  
23 pressure that they have to say, well, we haven't had  
24 anything happen here for 20 years, why do I need more  
25 money for this process safety group, you know? And, so,

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1 it's a real challenge to stay and stay resilient in that  
2 kind of atmosphere. And let's see, I think that's  
3 enough on that. We'll hit the other ones, I'm sure.

4 So, the next several slides I have various  
5 titles for them, but they're all around the same notion,  
6 cautions and challenges, challenges going forward, et  
7 cetera.

8 The first one, this is a quote from Dr. Fleming,  
9 I think it's St. Mary's University in Canada,  
10 Regulator's Guide to Safety Culture and Leadership, and  
11 he's been working with the International Regulators  
12 Forum for Offshore Drilling and trying to put together a  
13 sort of international guidance document for offshore  
14 drilling on this issue, and one thing he says in this  
15 paper is that the popularity of the concept has been  
16 counterproductive, and there's a danger of it becoming  
17 meaningless.

18 And I've done several talks on this because I  
19 see the same concerns, I have the same concerns. I see  
20 a lot of headlines, safety culture caused, and I think  
21 if you stop there, my biggest concern is a lot of times  
22 the fix -- the answer for some of the companies we work  
23 with anyway, the answer is to say, you're right, that's  
24 fine, we're going to train up those workers and make  
25 sure they don't, you know, they get -- they get better

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1 behavior, and that doesn't answer any of my questions on  
2 the whys going up.

3 So, I think he is worried or he states this  
4 correctly, I agree with that, that we could dilute the  
5 concept. There's a real fear of that.

6 I think I sort of hit on this, the overemphasis  
7 and this is on the sharp end, the front line worker, and  
8 I think this is a -- sometimes I think it happens  
9 because it's the easier thing to address, you know, that  
10 it's easier to take these recommendations and say  
11 clearly we can train workers to look at this better,  
12 train their attitudes.

13 It also ends up, I think, focusing more on  
14 personal safety because that's the easier things to  
15 grasp, and I had a trip to the United Kingdom where the  
16 Regulator there, and they have, a lot would argue, a  
17 much more robust regulatory system than us, in the Gulf  
18 of Mexico anyway, and the Regulator there was -- the  
19 industry wasn't very happy with us either, but she had a  
20 big PowerPoint slide with a person carrying a cup of  
21 coffee with a lid off of it, and she said that we have  
22 to start thinking farther than the coffee cup with the  
23 lid on it.

24 And I guess this whole focus on holding  
25 handrails when you're on the rigs, putting coffee lids

1 on. Not that it's not important, but she said that  
2 there was no emphasis, at least on the shop floor, the  
3 line workers, on how she was pushing for campaigning for  
4 a better training program and how -- what the workers  
5 were doing on a day-to-day basis related to the system,  
6 the overall system, and major accident risk. So, that  
7 was an emphasis of theirs.

8 And I think, you know, a lot would argue that  
9 they're much further along than we are in the Gulf on  
10 these issues, so...

11 Another issue is risk tolerance. When you think  
12 about safety culture, it's a matter of sort of unified  
13 values about safety and risk, and, again, I don't know  
14 that you can unify those values. I also think there's a  
15 question there of -- a larger question of who defines  
16 what's tolerable, you know, or what's acceptable. Is it  
17 the corporate level? Is it regulators? Is it society?  
18 And how does that play out, and what other work, you  
19 know, if -- if the work force has a much lower tolerance  
20 for risk than management, it seems like it creates quite  
21 a -- quite a tension there.

22 So, and, you know, the other thing you get into  
23 there is this whole notion, and I think it was brought  
24 up earlier, of stop work authority, and they have --  
25 they have this -- and in, in most of these offshore

1 facilities have this, in talking to, again, Norway, the  
2 UK, some of the higher level running organizations, they  
3 say, yeah, we have stop work authority, but the reality  
4 is if it's any critical path item, it's, it's -- you use  
5 it at your own peril, you know, and most people are very  
6 reluctant to use it at all, so it's not used for  
7 critical path.

8 In fact, petroleum engineers at a conference I  
9 was at were sort of challenging that and calling for  
10 that saying that we have to do better at this. We have  
11 to, you know, allow people to have that authority and  
12 be comfortable with that authority.

13 The next slide, just, just looking at I think  
14 most of the studies out there on safety culture right  
15 now and also on how you implement change, I don't see  
16 much considered on the question of power and authority,  
17 and, you know, obviously in these organizations you have  
18 different levels of power and authority from the line  
19 worker to the health and safety.

20 In Deepwater you had the safety people not  
21 reporting all the way up the chain. They were reporting  
22 to operations management, whose main driver was  
23 production. So, did they have the authority going up  
24 the line?

25 Similarly with the worker, that, you know, if

1 you're going to -- I think it's interesting that the  
2 Baker Panel Report called out for empowerment. Most of  
3 the reports you see call for involvement or informing  
4 the workers. This said worker empowerment, which I  
5 think a lot of work force people would appreciate that  
6 kind of language, but how do you do it? And I think you  
7 have to acknowledge when you're trying to make safety  
8 culture change, that these dynamics exist, otherwise --  
9 and they could be reasons for everything to fail or  
10 collapse when you're trying to make this change.

11 And, you know, it's not simply a moral  
12 commitment to safe behavior. You know, I feel, and by  
13 the way, if I didn't preface this slide, these are my  
14 opinions now. We're not getting into Chemical Safety  
15 Board opinions, but, you know, I feel that there's a  
16 better opportunity to change actions rather than change  
17 the way people think, so perhaps as an oversight group,  
18 you might have more influence in in recommending certain  
19 actions be done or recommending certain -- rather than  
20 recommending that everyone think the same and you have a  
21 unifying safety culture.

22 What safety culture shouldn't be? You can read  
23 down these, but, you know, my second -- the second  
24 bullet, I think, is the one I want to emphasize the  
25 most. I don't think it should be concerned with

1 employee -- with only the behavior-based safety  
2 programs, and this gets back to that addressing just the  
3 personal safety side of it. It's the easy part to  
4 address, make sure the workers have the -- the term I  
5 heard in the UK was they had the safety reps and the  
6 safety reps had more authority. Even within the  
7 regulations, the safety reps have designated stronger  
8 authority than the average worker on the rigs, and they  
9 were a derogatory term they were using was they were the  
10 PPE police.

11 So, if those reps are just watching for PPE and  
12 not reporting other things or looking for other process  
13 problems or maintenance problems, then that's an issue.

14 I'll go down to the impact of the regulatory  
15 oversight. I think -- I think it is an important role  
16 that -- and can have a lot of influence, especially in  
17 terms of telling people or advising what can be done.  
18 So, if they have a structure, for instance, if you're  
19 just requiring reporting of lost time injury rates and  
20 all the reporting metrics are related to personal  
21 safety, it should be no surprise that the strongest  
22 programs people have are in the personal safety arena.

23 I think this could be flipped, though, and more  
24 requirements could be included to improve metrics on  
25 process safety.

1           And there's this bit of an add-on, I see this as  
2 safety culture is part of the organizational culture,  
3 and I don't think it -- much like process safety or  
4 safety in general, it shouldn't be outside of  
5 everything. It shouldn't be an add-on to your  
6 organizational functioning. I think the same is true of  
7 the safety culture. It has to be thought of as part of  
8 your organizational -- part of how you do -- how you do  
9 what you do.

10           And this -- this, this speaks to how do you fix  
11 the problems, and, you know, this is just a caution I  
12 guess that the things that are measurable and malleable  
13 in terms of your behaviors, and it's often the lowest  
14 level actors with the least authority, as she says, in  
15 the organizational hierarchy.

16           So, again, the fix can't be just at the fix the  
17 worker, or blame the worker, fix the worker approach.

18           Finally, leadership in safety culture, just a  
19 couple of final concluding points. Measuring safety,  
20 the absence of failure, this is our business, right?  
21 The absence of failure doesn't equal effective systems.  
22 We see this all the time. They haven't had anything  
23 wrong for 20 years and they have a -- they have the big  
24 one.

25           They can't let the boundaries of safety slide.

1 I mean, I think this is this resilience issue, and if  
2 management doesn't want to hear it, people stop talking.

3 And then there's the complacency thing, but the  
4 management doesn't want to hear people stop talking, I  
5 think the other challenge from leaders is that I've seen  
6 this a lot where in a lot of organizations we've looked  
7 at, that there seems to be high commitment from  
8 leadership, but then somewhere in middle management,  
9 there's mixed signals being sent. They're still being  
10 -- they're still getting most of their performance  
11 reviews based on production, so if that's the case, then  
12 what are they going to tell the shop floor workers, and  
13 what are they going to -- they're not going to want to  
14 hear bad news.

15 So, even though the leaders at the top might be  
16 saying safety first and all this stuff, somewhere in the  
17 middle, in middle management, all their metrics, all  
18 their performance measures are flipped, and we've  
19 actually -- I've heard from several that are really  
20 looking at that now since it's a topic in several large  
21 refineries where they're looking at changing those  
22 performance metrics for middle managers.

23 And you know what? I realized I should have  
24 like a submarine at the end of my presentation instead  
25 of an email address, but anyway, so that's all I have.

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1 I hope that was helpful, and be happy to answer  
2 questions.

3 DR. WINOKUR: Thank you very much. I think it  
4 was very helpful. You might try the explosion at the  
5 end, that would probably get some attention, too.

6 MR. GRIFFON: Yeah, I've got to rework that.

7 DR. WINOKUR: So, we're talking about leadership  
8 and safety culture, and I want to stay on that theme a  
9 little bit, and I want to get a sense of what leaders  
10 we're talking about here. So, let's talk about what  
11 happened at the Texas City refinery and what happened in  
12 the Gulf.

13 We're not really talking about the head of BP,  
14 British Petroleum. I mean, he's in London. And we're  
15 not really talking about the Secretary of Energy. He's  
16 here in Forrestal, and he's running \$30 billion worth of  
17 programs.

18 I mean, there must be some leader that you've  
19 seen who can make a difference here and, you know, get  
20 this connection to the workers and the attitudes and  
21 behaviors and so on. Where do you think that leader is  
22 in these plants or what's the sphere of influence that  
23 we really need to be looking at for the right leader?

24 MR. GRIFFON: Yeah. I think, I mean, based on  
25 my observations and the CSB's investigations, I think,

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1 you know, a lot of these organizations, the plant  
2 manager is -- and I know it's a bit cliché, but we've  
3 heard it earlier, you know, that they, they really have  
4 to walk the walk, walk the talk, and the ones that are  
5 effective, the ones that get out on the shop floor can  
6 have the influence.

7 I think it's also important, a lot of what we've  
8 seen is looking at the leadership, not just necessarily  
9 a single leader, but the general manager along with the  
10 folks that work at the leadership level, and how that  
11 decision-making occurs and what information they get fed  
12 up to them. So, they have to be, I think, interested in  
13 hearing some of the bad news, not having it filtered out  
14 at the lower level, not just saying, you know, well, our  
15 injury rate levels look great, and I guess we're doing  
16 great.

17 I've been shocked by, over the last four years  
18 I've been at several conferences where I'm having a  
19 really good discussion with one of the co-presenters  
20 from a company, and they'll be saying a lot of the right  
21 things in terms of process safety and, you know, how  
22 we're thinking at the CSB, and they lead off their  
23 presentation by saying how great fill-in-the-blank X  
24 company is doing. You know, in the last five years, our  
25 injury rate -- you know, they just start with three or

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1 four slides on injury and illness rates, and like I  
2 said, not that that's not important, but when you're at  
3 a process safety conference talking about major accident  
4 hazard, and they had no metrics on the other stuff.

5 So, so, I think that general manager and that  
6 general manager's interest in process safety and  
7 understanding the importance of sort of being resilient  
8 in that regard, I think that's critical. And I think  
9 they do set the tone, but I also think they have to pay  
10 attention to not sending mixed signals. It's not just  
11 sloganeering. It can't just be, you know, safety first  
12 and a lot of posters around the facility. It's got to  
13 filter to mid-management as well.

14 DR. WINOKUR: So, when we look at leaders and  
15 things that they may improve or the weaknesses, and we  
16 had this discussion a little bit this morning with Mr.  
17 Sullivan, is it the fact that they don't understand the  
18 hazards? They may not have the technical background  
19 they need to appreciate what can happen, or is it that  
20 they don't respect the hazards, more along the lines of  
21 being complacent and saying, it never really happened  
22 here before, we don't expect it to happen again?

23 Where is the pitfall in terms of what their --  
24 because when it's all over with, they must be just  
25 beside themselves that 10 or 15 people have died and --

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1 MR. GRIFFON: Yeah. I mean, I think it's  
2 probably a mix of don't fully appreciate the hazards,  
3 and also when they're being told for several years that  
4 everything is going well, all these metrics look good,  
5 everything they're reporting is good, and at the same  
6 time they're being asked for more money to do X, Y or Z,  
7 it's an obvious question of why.

8 So, there might be a little bit of not  
9 understanding the idea of this -- the field that we're  
10 in. Again, the low probability/high consequence  
11 incident, and not fully appreciating the risks that they  
12 could face. I think that's part of it.

13 DR. WINOKUR: So, what does it take to get a  
14 leader to acknowledge and understand the dangers of  
15 these low probability/high consequence accidents?

16 MR. GRIFFON: Well, hopefully it's not the big  
17 accident. Sometimes that's the case though, you know?  
18 I've actually spoken to somebody that said they -- that  
19 some of these managers that went through these big  
20 incidents, anybody was reluctant to hire them for  
21 similar positions, and the person I was talking to made  
22 the reverse argument, they said, this would be the  
23 perfect person to hire because they've gone through this  
24 and they really respect it and appreciate it.

25 I met a person at a conference that was doing

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1 exactly that. He went through -- he wasn't the general  
2 manager at that time, but he went through the Phillips  
3 incident, and he said it changed his life. It gave him  
4 a whole new respect for it. But I guess it's just these  
5 ideas of lessons learned.

6 I also think it's an understanding of  
7 cross-sector. I've tried to do this for the last  
8 several years with talks with the nuclear industry,  
9 particularly because of my background, I've been engaged  
10 in that, but the idea that these learnings -- just  
11 because it was a refinery, doesn't mean that there can't  
12 be learnings for managers in the nuclear sector. I  
13 think the NRC really appreciated that, they invited me  
14 my first year on the Board, and they said, we would love  
15 for you to come and talk about Macondo, but we don't  
16 want to hear anything about the blowout preventer, and  
17 that, to me, spoke that they're really thinking about  
18 how this could apply to what they're doing.

19 So, I think that's another thing, is that they  
20 -- that you can't wait. The leaders shouldn't be  
21 waiting for it to happen at their facility, but they  
22 have to be exchanging this information. I think there's  
23 a couple of model, I won't name companies, but there's a  
24 couple of companies that are doing really good things in  
25 this regard, they're doing training where they actually

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1 link -- they actually talk about process safety elements  
2 within their own organization, and then they link it to  
3 a Piper Alpha accident or something like that, and it  
4 tells the younger work force that, you know, you haven't  
5 seen one of these, but if this isn't done right, this is  
6 what could happen.

7 So, I think that part of it is critical. Don't  
8 wait for it to happen at your facility, you know, share  
9 those lessons learned or get those lessons learned from  
10 others.

11 DR. WINOKUR: Alright. We can chat about that  
12 more later. Mr. Sullivan?

13 MR. GRIFFON: Okay.

14 MR. SULLIVAN: Thank you, and thank you for  
15 coming, Mr. Griffon, and I've already forgiven you for  
16 not having a submarine picture.

17 MR. GRIFFON: I have to work on that, yeah.

18 MR. SULLIVAN: But you only get one free pass.  
19 I want to -- you just -- I want to follow up on the  
20 Chairman's question talking about the level of  
21 leadership, and I think you identified sort of the plant  
22 manager level. My background is in the Navy. It was a  
23 big Navy. We've got fleet admirals, but sort of the  
24 commanding officer of a vessel might be a comparable  
25 level.

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1           The question goes to what is the experience and  
2 the background of the person who got there, how did they  
3 get there, and what I'm really looking for your insight  
4 on, based on your experience, is if you notice any  
5 difference or place any preference for what I would  
6 think is a trade-off between you have an individual who  
7 maybe comes to a plant and starts at the lower level, 20  
8 years later that person is now the plant manager, so  
9 they know that plant. They know its ins and outs.

10           On the other hand, if they learned something  
11 that is a bad way to do business, bad habits, if you  
12 will, those bad habits may stay. The Navy sort of  
13 benefits by having -- you have many submarines, and from  
14 a technical standpoint they're all very similar, if not  
15 actually identical, and so you can move from one to the  
16 other as you grow, get higher in authority.

17           By the time you get up to that plant manager  
18 level, you are the technical expert on that submarine,  
19 but on the other hand, you didn't stay in one place and  
20 you get to see different ones.

21           MR. GRIFFON: Yeah.

22           MR. SULLIVAN: So, is there -- would you say,  
23 generally, do you have any thoughts about whether or not  
24 it's better to see movement prior to you getting to that  
25 level or have somebody who really understands that plant

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1 and has been there for a very long time, be at that  
2 plant manager level?

3 MR. GRIFFON: Yeah. I don't know if I have a  
4 lot of experience to offer on that question, but I mean,  
5 I would say we see a variety of leaders at the different  
6 plants that have been, you know, as you describe, the  
7 ones that worked there for 30 years, worked their way  
8 up, and they're in charge, and there's certain benefits  
9 to that.

10 We've also seen some that come from the outside  
11 but not even with the technical background. They're  
12 more run there to get the plant in financial shape.  
13 And, so, I guess for me, I don't -- you know, I think I  
14 could see places where either leader could be effective,  
15 but they also need to probably have a good leadership  
16 team.

17 So, the person that's more financially oriented  
18 has to understand what they don't know and has to ask  
19 questions and have a team of experts around them that  
20 could be working with the lower managers and process  
21 people, and I just don't have experience with what you  
22 said, shifting from one, it makes a lot of sense in the  
23 Navy system.

24 What does happen in like refineries, and I'm not  
25 sure this is necessarily a positive, is that they have

1 constant either selling refineries, so they have  
2 different company takeovers, and upper management will  
3 change and come in with a bunch of their own new  
4 initiatives. And, you know, it may be better, it may be  
5 worse, but it's new. It definitely creates a flux  
6 situation for all the site because they're used to doing  
7 things a certain way.

8 So, we see a lot of that. I'm not -- I'm sure  
9 there is some migration of people that had a lot of  
10 experience at one plant and moved to manage another, and  
11 might be some benefits to that, but the effect we've  
12 seen on that -- the other issue we have as far as sort  
13 of safety and sort of continuity in it, is this the  
14 challenges of the middle managers.

15 Middle managers in the refineries, and I think  
16 it's true offshore as well, a lot of them are looking  
17 for the fast track to corporate. And, so, just, again,  
18 it gets back to ways their performance are measured, and  
19 a lot of times they're very reluctant to take on sort of  
20 long-term safety challenges because it's going to make  
21 their bottom line look worse and their performance not  
22 look as good, so they want to look as good as they can  
23 for the three or four years they're in that position and  
24 then move up the ladder.

25 And, you know, again, that's a challenge to sort

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1 of having the organization's process safety continually  
2 improve.

3 MR. SULLIVAN: So, I would like to --

4 MR. GRIFFON: I'm not sure I got to your  
5 question because I just don't have much experience on  
6 that one part of it.

7 MR. SULLIVAN: That's okay. I don't remember my  
8 question anymore. I want to follow up on, you talked  
9 about the flux that happens in refineries when companies  
10 get bought out. We actually see something similar when  
11 we're doing our oversight work with the Department of  
12 Energy, that they compete contracts for contractors, but  
13 the nature of the beast is they can change contractors,  
14 but there's only so much talented work force in the  
15 vicinity of the plant.

16 They happen to be the same people, so the middle  
17 -- the middle to the lower, they're all end up being the  
18 same human beings, and we just change out the corporate  
19 structure.

20 MR. GRIFFON: Right.

21 MR. SULLIVAN: So, we see that happen in the  
22 area that -- that we are interested in, and I'm just  
23 wondering if you -- I know you mentioned it. I'm not  
24 sure you gave any thoughts as to whether that was a good  
25 thing, a bad thing, or a mixed bag.

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1           MR. GRIFFON: I see it -- it's a -- it's a  
2 challenge I'd say. You know, I'm not saying whether  
3 it's good or bad, but it's a challenge. I know talking  
4 to some of the folks at Texas City, that plant got sold,  
5 and they actually told me, this is four years -- I mean,  
6 this is three years into my term, so it's several years  
7 after the 2005 incident, and they said they actually  
8 felt like they were making headway, but then the new  
9 team that came in had all new initiatives, and they're  
10 dropping this initiative that they thought was very --  
11 so, you know, it creates this flux and you have to at  
12 least manage that and understand that, you know, and if  
13 you're going to have -- I mean, that's the challenge of  
14 a unifying safety culture, too. If you -- there's got  
15 to be a meeting of the minds at some point that this new  
16 management team coming in -- maybe they have great ideas  
17 and the work force that's been there for years should be  
18 open to this change, but you have to manage that change.

19           That's all I'm saying. So, it can be -- I think  
20 we've seen mixed bags, but it's something that certainly  
21 has to be paid attention to.

22           MR. SULLIVAN: Thank you.

23           MR. GRIFFON: Thanks.

24           DR. WINOKUR: Ms. Roberson?

25           MS. ROBERSON: So, I guess first I make a

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1 comment and then I'll find out if you agree or disagree,  
2 and then I have a couple of questions.

3 One is, I mean, as you know, I definitely think  
4 the focus on process safety, first personal safety is an  
5 important one, and the -- I call it the personal safety,  
6 the safety bubble, and therefore if there's any  
7 turbulence inside or outside, you can burst the bubble  
8 pretty easy, but why is it so hard for leaders -- so,  
9 this morning we talked about the Navy, their SUBSAFE  
10 system I consider to be a process safety investment.  
11 Why -- you guys do investigations. Do you see the  
12 leadership in different companies taking hold of that  
13 lesson learned from accidents?

14 MR. GRIFFON: Yeah. And I think to different  
15 degrees I guess I would say, but yes, there is  
16 definitely more attention now to sort of process safety  
17 and process safety metrics, and how to get their arms  
18 around it. Some of it is pretty challenging.

19 I mean, I've heard anecdotally people that they  
20 start measuring a certain metric and they collect all  
21 this reams and reams of data, and they realize that it  
22 probably wasn't the right metric to begin with. So, you  
23 know, there's a lot of trial and error with these  
24 metrics. What's the appropriate metric to be looking  
25 for when you haven't had the major accident that you

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1 might be trying to prevent for years.

2 So, it's harder to see the leading indicator,  
3 whether it's the right leading indicator, but there's  
4 certainly more attention being paid to it. I guess the  
5 shocking thing for me is that there's still so much out  
6 there that you see people presenting and saying that  
7 injury rates are low and therefore we're doing  
8 wonderful, you know. So, there seems to be some sort of  
9 disconnect still.

10 I know that prior to Deepwater, I think it was  
11 in 2009, there was an argument made by the industry  
12 group that there wasn't a need for a safety and  
13 environmental management system regulation offshore in  
14 the Gulf, and part of their argument was that they have  
15 a slide in their presentation showing the low injury  
16 rates compared to other industries, and their offshore  
17 is way down here and then petroleum and general sector,  
18 you know. And, so, on that graph, it was obviously a  
19 convincing argument to some, but I think, yeah, it's  
20 definitely being paid attention to more, but there's  
21 still, I think, some, some disconnect.

22 MS. ROBERSON: So, let me ask you, in the --  
23 what you can share in the investigations that the Board  
24 has conducted or the ones that you've evaluated when you  
25 weren't on the Board, have there been any where there

1 was an obvious disconnect between the quality of  
2 leadership and things going wrong down below?

3 MR. GRIFFON: I would say, their -- their --  
4 that we've seen problems with the organizational issues,  
5 you know, including the inattention to -- that safety  
6 didn't report directly up the chain, that sort of thing.  
7 I don't know that we looked at individuals themselves,  
8 you know, individual leaders and their qualities, but  
9 there was obviously the structure of the organization,  
10 the focus of the organization seemed to suggest -- had a  
11 flawed model to start with.

12 MS. ROBERSON: So, are there other things that  
13 you conclude would be important traits? I mean, the  
14 structure is definitely one you just cited. Do you have  
15 to pay attention to the other key traits that you think  
16 would be important for a leader to pay attention to?

17 MR. GRIFFON: Yeah. Well, I guess just, you  
18 know, this notion of really understanding what's going  
19 on, you know, below them in a sense, you know, and then  
20 being on the shop floor, being willing to hear bad news.  
21 And when I say that, it's like, well, who is not going  
22 to be willing, but I mean, there has to be some sort of  
23 openness that the workers really say, yeah, this is  
24 okay, we can report this up.

25 You know, there's also challenges to making that

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1 happen. I mean, it doesn't get lost on me the fact that  
2 we talk about this trusting relationship to report bad  
3 news up the chain or whatever, and yet some of the  
4 systems that we say are the best is like in aviation,  
5 they have an anonymous reporting model. Well, if they  
6 had an open, trusting work environment, why do you  
7 require an anonymous reporting model?

8 And I know there's reasons, but, I mean, it's  
9 just -- so, I think -- but the leaders have to be open  
10 to hearing that bad news and not just want to put on the  
11 blinders, so to speak.

12 MS. ROBERSON: Thank you.

13 MR. GRIFFON: Sure.

14 DR. WINOKUR: Mr. Sullivan?

15 MR. SULLIVAN: I want to follow up on the  
16 structure, specifically with respect to internal  
17 oversight as opposed to external oversight by a  
18 regulator, but whatever internal oversight models have  
19 been used by different companies, if you can share any  
20 either best practices or worst practices that you've  
21 seen?

22 MR. GRIFFON: Yeah. I mean, there is definitely  
23 the internal oversight models. I think I've seen --  
24 we've seen the gamut of it. Again, it goes back to the  
25 internal, the corporate auditor being sort of accepted,

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1 and that they're, just a -- not viewed as, oh, here  
2 comes some bad news from corporate, but rather, they  
3 give us some great insights, and we have to address  
4 these. This is good. We're getting a fresh set of eyes  
5 to look at our issues, and I think you can quickly see  
6 the difference.

7 I mean, there's some that -- so, I think that  
8 model is important, that the management from the top  
9 down has to say, this is corporate coming in, but we  
10 want to look at this as a learning opportunity, not as,  
11 you know, clean everything up and cover everything up  
12 and don't give them everything, don't give them access,  
13 that sort of thing.

14 So, I've seen both sort of models, and I think  
15 obviously the one that's in my opinion more effective is  
16 that one where they're using it as a learning  
17 opportunity. And then in some of the systems we've  
18 looked at, you also have the sort of third-party  
19 verifiers, and that's been a bit of a mixed bag, too,  
20 because there can be a strong impression that they're  
21 basically paid by the company to tell them what they  
22 want to hear.

23 And I've heard from the third party verifiers  
24 some of the frustration they have is they're doing a  
25 sort of random audit, and they'll find something wrong

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1 like one flange is bad. Well, they only looked at ten  
2 out of a thousand, and they found two that were bad, and  
3 the company says, oh, that's okay, we're going to fix  
4 these right away, and don't write that up, you know.

5 So, that's not the way to work with your  
6 auditor. That's not the right model. It's not going to  
7 help you in the long run, so.

8 MR. SULLIVAN: Thank you.

9 MR. GRIFFON: Thanks.

10 DR. WINOKUR: We've been talking about process  
11 safety and personal safety for a long time, and when I  
12 first came on the Board, and that was eight years ago,  
13 all we pretty much saw at sites was slips, trips and  
14 falls. I mean, the site managers immediately want to  
15 tell us about their DART and TRC records, right, and  
16 we've worked with the Department quite a bit on that,  
17 and I think they've made a lot of progress. I think  
18 they have a better set of metrics and they certainly  
19 have a pretty good occurrence reporting system, so in  
20 that sense DOE, I think, is doing better.

21 But I want to understand why you think this  
22 imbalance continues to exist between -- or there isn't a  
23 clear enough understanding of the need for process  
24 safety at these facilities.

25 MR. GRIFFON: Yeah. I mean, I think -- I can't

1 speak to DOE so much, but in the OSHA arena and in the  
2 private sector chemical companies that we're dealing  
3 with, I think some of it comes back to a sort of  
4 compliance mindset. So, I'm not in any way blaming  
5 OSHA, but the regulations are focused on reporting those  
6 things, and therefore if the company also has this sort  
7 of compliance mindset, then they're going to have their  
8 safety -- they expect their safety group to comply with  
9 OSHA, and that's the extent of it, and they don't want  
10 to, you know -- now, OSHA also has process safety  
11 management, but they don't have the reporting  
12 requirements and things like that in there. So, I think  
13 that's part of it.

14 I think, you know, the other factor, which I've  
15 already mentioned, the other factor is that they just  
16 don't see these things very often, and especially for  
17 smaller companies to make a bigger investment on  
18 something that they haven't heard of or seen in 30  
19 years, it's difficult, you know. So, there's a  
20 challenge there to just not just say, well, we've been  
21 out -- I think we're still working on this  
22 investigation, but we went to a place that had  
23 unbelievable, by our investigator's accounts anyway,  
24 housekeeping was immaculate. The general manager, I  
25 think it was like a family kind of owned place, you

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1 know. The general manager knew everybody there, knew  
2 everything, you know, would probably get great scores on  
3 safety culture, and that part of the safety record was  
4 great, and I think they just never -- the hazard, the  
5 explosion that occurred, they just never anticipated the  
6 hazard at all.

7 They weren't covered under process safety  
8 management, so they weren't even required to look at it.  
9 And, you know, so, some of it, I think, is back to the  
10 focus, the emphasis for the last 20, 25 years on  
11 reporting anyway, and on everything the Government is  
12 looking at is those injury illness records, less  
13 interest on the process, and I think one role the  
14 regulator could play, and we've actually made this  
15 recommendation to OSHA, to add in process safety  
16 indicators.

17 MR. SULLIVAN: And you've made that point that  
18 there could be a regulatory component. One of the  
19 things that I've personally spoken at some DOE workshops  
20 about is the cost of safety and the cost of accidents,  
21 and it's pretty sobering.

22 MR. GRIFFON: Right. Yeah.

23 MR. SULLIVAN: And you may not be aware, but DOE  
24 recently had some accidents down at the Waste Isolation  
25 Pilot Plant, which may be offline for two or three

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1 years, and the cost, in the end, is hundreds of millions  
2 of dollars to fix the problems down there. And  
3 typically, I mean, I don't know, what is the cost of the  
4 -- to BP of the Macondo or Texas City refinery? What  
5 are those costs roughly? Are they in the billions?

6 MR. GRIFFON: Yeah, I don't know -- I don't know  
7 even know the numbers there, but they're huge, yeah,  
8 yeah. But I don't know that they -- that those large  
9 oil companies can't absorb those even, so...this is my  
10 opinion, of course. But they're enormous, yes, and the  
11 other thing they also consider is obviously the effect  
12 on the corporate image and everything else, and the  
13 communities they're working in. So, yeah, it's a big  
14 toll.

15 DR. WINOKUR: One of the things I've heard why  
16 slips, trips and falls are a good measure as opposed to  
17 process safety is that they say slips, trips and falls  
18 are leading indicators, and if you can't take care of  
19 the little things like somebody tripping on a step, then  
20 that's eventually going to lead to bigger and bigger  
21 problems.

22 So, it's just there's a value on it, and once  
23 again, I'm not minimizing slips, trips and falls, and I  
24 would not minimize them on an oil rig, where I do think  
25 if you tripped or fell, you could have a serious

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1 problem.

2 But still, I think there is some of that  
3 mindset. Do you think that that's true?

4 MR. GRIFFON: I think it's a false premise. I  
5 don't think these are leading indicators of the  
6 process accidents.

7 DR. WINOKUR: I don't think so in that sense  
8 either.

9 MR. GRIFFON: Yeah. Right. I mean, I think --  
10 look at oil rigs. You know, they -- right after I went  
11 out on my first rig offshore, they shared with me a  
12 presentation on all the helicopter accidents that occur,  
13 and it was my first helicopter ride to a rig, you know?  
14 So, I don't -- I don't minimize the personal safety side  
15 of things for sure, and the falls from height on the  
16 rigs are another major problem.

17 Especially in the North Sea, I mean, these  
18 things are all over the place and very, very dangerous,  
19 but I think that's been a premise that's been put  
20 forward for years, that if we have these rates low  
21 enough, therefore we're protected from a major accident,  
22 and I think it's been pretty well -- literature has  
23 pretty well gotten rid of that notion, that the two are  
24 disconnected, and you have to look at other indicators.  
25 You have to look at other metrics to sort of have a

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1 sense of the health of your system.

2 DR. WINOKUR: What was the basic point, one more  
3 time, my last question now, about what you were trying  
4 to say associated with power relationships?

5 MR. GRIFFON: I think to look at safety culture  
6 at the sites and not to consider power relationships  
7 is -- it's not appropriate. I mean, you have to weigh  
8 in the different power relationships and authorities  
9 that people at all different levels have within the  
10 organization. Otherwise it could end up being -- it  
11 could end up blowing the whole thing up, the change  
12 you're trying to promote if you don't consider how the  
13 unions are working with management or contractors.

14 There's a lot of -- on refineries especially,  
15 there's opinion, we hear it quite frequently, is that  
16 workers say, well, you know, especially during  
17 shutdowns, they hire a lot of contract workers, and the  
18 union workers are usually pretty angry about that. But  
19 it's not only connected to wages, they say, it's also a  
20 health and safety component because you're bringing in  
21 these groups of people that might be the low bidder or  
22 whatever.

23 So, you have these -- whoever is right or wrong  
24 on these issues, you have these relationships, the  
25 contractors, the unions, the management, and you have to

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1 consider that when you're trying to consider how do I  
2 unify the culture around safety.

3 DR. WINOKUR: Thank you.

4 Ms. Roberson?

5 MS. ROBERSON: I don't have any additional  
6 questions.

7 DR. WINOKUR: Well, I'll just end with one  
8 question and then we'll move on, and that was that last  
9 question, and I don't know if it was mine or yours, but  
10 I asked it before, it may not even be a good question,  
11 but what recommendations can you make to an organization  
12 trying to provide oversight, you know, a better way for  
13 us to perform the oversight role that could help DOE  
14 improve its culture? And once again, it's DOE's  
15 culture, not our culture, but where can independent  
16 oversight provide some benefit?

17 MR. GRIFFON: Yeah, I mean, I think you can play  
18 a role, at least in -- well, I mean, I think there's a  
19 program right now that's sort of come up through DOE out  
20 of the incident. It's a -- I knew I'd forget the name  
21 of it.

22 DR. WINOKUR: Safety-Conscious Work Environment?

23 MR. GRIFFON: Safety-Conscious Work Environment,  
24 yeah, and I guess I would -- one role is I think it's  
25 appropriate for your Board to be looking at, is that the

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1 right tool or the right fix for the problem? And I will  
2 say I talked to some safety reps at the conference I was  
3 at with you, Dr. Winokur, in Las Vegas, that are now  
4 questioning whether that points more toward personal  
5 safety fixes than toward the more systemic problems.

6 And, so, I think that's maybe one area where you  
7 can weigh in with guidance or with additional  
8 recommendations, you know, clarifying recommendations,  
9 whatever.

10 DR. WINOKUR: All right. Thank you very much  
11 for that presentation and answering our questions, and  
12 we will now move to Dr. Meshkati, or Professor, I  
13 believe.

14 PROFESSOR MESHKATI: Thank you very much,  
15 Chairman Winokur. My name is Naj Meshkati, I'm a  
16 professor at University of Southern California. And to  
17 the Ms. Roberson and Mr. Sullivan, it's really an honor  
18 for me to be here.

19 There are much more qualified people than me  
20 that can make this presentation. One of them is  
21 watching us over the Internet, that's my mentor, Mr.  
22 Earl Carnes. I want to be on the record that I  
23 acknowledge him, but whatever I do good, I learn from  
24 him; whatever I did bad is all my own fault.

25 DR. WINOKUR: I'm so happy to hear you have a

1 mentor still.

2 PROFESSOR MESHKATI: In fact, I would like to  
3 start with another -- first of all, I would like to  
4 point out that this is basically my personal reflection  
5 of last 25 or last 30 years being in this business. As  
6 you mentioned in my bio, I have visited many nuclear  
7 plants, Chernobyl, Three Mile Island, Fukushima in 2012,  
8 and many nuclear plants, and I have been on several  
9 committees, and I've had the privilege of being on two  
10 national panels on that, but what I'm presenting to you  
11 is very much my personal reflection and the story that I  
12 learned from my mentors and from my own research.

13 I would like to start again by another mentor of  
14 mine that he has a book, which I'm going to show it to  
15 you, and that is Professor Jim Reason, that I noticed he  
16 was promoted to be Admiral Jim Reason in the previous  
17 panel, but Jim Reason is so dear and God to me at least,  
18 but he has a recent book, and that is this one. It's  
19 his latest book called "A Life in Error", and again,  
20 being a university professor, I would like to assign a  
21 reading to all of you colleagues here. This is a  
22 must-read. It's a very smart book. And, it's called "A  
23 Life in Error." This is really a compilation of Jim  
24 Reason's research in last 30 years that you know about  
25 human error, you know about organizational accidents,

1 you know about human contribution, but this is really  
2 the finale, so far. I know that he is working on  
3 another book.

4 But look what he has said about safety culture  
5 in this, and I'm quoting that from his page 81, and I  
6 put this title because I think -- I put that in this  
7 title in the context that I'm familiar with, root cause  
8 accident, common mode failure, and because of what Jim  
9 says, Professor Reason says, I think culture is a very  
10 important issue.

11 This is exact quote from page 31 of his book.  
12 "Because of their diversity and redundancy, the defense  
13 in-depth will be widely distributed throughout the  
14 system." We know multiple layers of defenses that we  
15 have in nuclear plant, the last layer of defense is the  
16 containment dome, and then we have other layer of  
17 defenses going down. But this layer of defense for all  
18 sort of technological systems, to the extent that I  
19 know, they are basically, they exist in different  
20 places.

21 Then he says, "as such, they're only  
22 collectively vulnerable to something that's equally  
23 widely spread, the most likely candidate is safety  
24 culture."

25 And the last line I think that is the key: "It

1 can affect all elements and systems for good or bad."

2 For example, if you look at, we could have -- I  
3 always refer to the accident that I started my career by  
4 investigating that or writing about that Bhopal Chemical  
5 accident on December 3, 1984, and that accident, we  
6 could have stopped the release of the material, that was  
7 cyanide. After the water got into tank 610 and the  
8 reaction started, we have had several layer of defenses,  
9 like water curtain, and then the scrubber, and then from  
10 the scrubber the water curtain and flare tower, but all  
11 these three were broken. They all fell off because of  
12 bad safety culture. Of course, there are many examples  
13 like that.

14 I think Jim Reason genius has put such an  
15 important issue in such a succinct of three, four  
16 paragraphs over there. And I call that this is my  
17 premise, this is what I have seen in my professional  
18 career, I want to come back to that.

19 For now, I would like to concentrate on  
20 Fukushima because I knew the Honorable Mark Griffon  
21 would be here, he would be talking about BP, Deepwater  
22 Horizon, and Rear Admiral Tom Eccles was here that I had  
23 the honor of serving with him and others on the BP  
24 Deepwater Horizon, that's why I want to concentrate on  
25 Fukushima, and if there is some question on that, I can

1 come back to the BP Deepwater Horizon.

2 Let's look at Fukushima. That's the one that I  
3 spent the last three years of my life on that. But this  
4 is a very rudimentary map of Japan. You see Tokyo over  
5 here. You see Fukushima Daiichi over here. You see  
6 Fukushima Daini over there. I would like to come back  
7 to it later.

8 As you see, Fukushima Daini is closer to Tokyo  
9 than Fukushima Daiichi, and I will come back to it.  
10 This is just to give you some relatively -- relative  
11 location. I want to come back to this map because there  
12 is another nuclear plant that I would like you to pay  
13 attention to.

14 The Fukushima accident happened on March 11,  
15 2011, and there have been several investigations of the  
16 Fukushima accident, excellent investigations by the  
17 International Atomic Energy Agency, by the Parliament of  
18 Japan, which is called National Diet, and then by other  
19 agencies which I will come back to it.

20 But if you look at the -- really the root cause  
21 of the two Fukushima accidents, this is what happened  
22 exactly. One, we had -- of course, we had the  
23 earthquake; 45 minutes later the tsunami came. The  
24 earthquake basically caused loss of offsite power. That  
25 happens a lot. We are prepared for that. In U.S.

1 nuclear plants, everybody, loss of offsite power.  
2 That's why we have something which is called emergency  
3 diesel generators.

4 And because of the loss of offsite power, of  
5 course the reactor, they shut down automatically, in the  
6 case of Fukushima, both plants, Daiichi and Daini,  
7 emergency diesel generators are kicked in.

8 However, I have to say for the record that  
9 emergency diesel generators are very temperamental  
10 machines, and as we know about this accident -- this  
11 earthquake that was near Washington, D.C. a few years  
12 ago, one or two of the emergency diesel generators at  
13 the nuclear plant, they didn't kick on.

14 But in this case, the diesel generators kicked  
15 off, and everything was good. However, 45 minutes  
16 later, tsunami came, and that tsunami basically  
17 inundated emergency diesel generator or their  
18 switchboard or their cooling pump. In some cases,  
19 basically emergency diesel generator, they became  
20 inoperative because they themselves got inundated or  
21 their cooling pumps they got inundated. They couldn't  
22 send the cooling water around the diesel generators,  
23 they had to overheat and shut down or some of them their  
24 switching systems and they cut off.

25 The combination of one and two, meaning the loss

1 of offsite power inundation after emergency diesel  
2 generator due to tsunami caused something which is  
3 called a station blackout, and a station blackout was  
4 exactly the thing that it's one of the most severe  
5 accident that could happen, and there is this history,  
6 you know that very well.

7           However, the difference between Daiichi and  
8 Daini was in the case of Daini, when that great line  
9 that fell off, one 420-kilovolt pylon was still on.  
10 However, that was sitting outside the fences of Daini.  
11 Everything inside the connection of that to the plant  
12 got lost.

13           That's one of the biggest or luckiest things  
14 that the Daini people had, which Daiichi didn't, as far  
15 as I remember. I can double check that for the record.  
16 But I would like you to keep that in the back of your  
17 mind when I come back to it.

18           National Academy of Sciences, at the request for  
19 U.S. Congress, they put together a committee, it was  
20 called Fukushima Lessons Learned Committee for Improving  
21 U.S. Nuclear Power Plant Safety and Security. This  
22 committee consists of like 20 members. I was a member,  
23 and a technical advisor on this committee. The  
24 committee released this report on June 24, 2014, just a  
25 few months ago.

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1           As this committee visited Fukushima, Daiichi,  
2           Daini and other plants and studied a lot of issues over  
3           there, however, I have to have this disclaimer that I  
4           learned from Honorable Mark, that I am speaking as  
5           myself here, not as a former member of the committee or  
6           maybe I'm not reflecting the points of view of  
7           committee. That's why I put that personal opinion under  
8           that because I quote the committee, but I may give a  
9           little spin to that that some committee members may not  
10          necessarily agree with that, but anywhere that I have  
11          excerpts from the committee, I quoted.

12          These are my personal observations. Was  
13          Fukushima a natural disaster or what we call that  
14          natural disaster or earthquake triggered a anthropogenic  
15          man-made accident? From the day one of that, or after a  
16          few weeks, this issue was discussed in media by many  
17          people. What was Fukushima? And basically this report  
18          came on the first anniversary of that.

19          As you see, the title asks "Why Fukushima was  
20          Preventable." The former commissioner of -- and this  
21          statement is very interesting, let's say. It was  
22          preventable if it had we had appropriate enforcement.

23          The former Commissioner of U.S. NRC, my dear  
24          colleague from MIT, Professor George Apostolakis, gave a  
25          talk at a meeting. I think he gave a talk at that first

1 anniversary. As you see, his statement is very  
2 politically correct, about the issue of preventability  
3 and being able foresee. But again, because he was a  
4 Commissioner on that, he had to be politically correct.

5 But basically the debate on preventability of  
6 Fukushima came to attention of people, and that's what I  
7 would like to concentrate on that and relate that to  
8 safety culture and leadership here.

9 National Diet of Japan, which is the name for  
10 the Parliament, they came with their report. It was  
11 released on July 2012, I guess, and the Chairman of this  
12 group was Dr. Kiyoshi Kurokawa. I met him when we went  
13 to Japan, and I met him again when he was in Los Angeles  
14 on a private trip two months ago. And, so, I learned a  
15 lot from this gentleman.

16 He wrote an introduction for this National Diet  
17 report. It's the most comprehensive study that I saw.  
18 That introduction is one page. Within that one page,  
19 four times he uses the term "mindset," in one page,  
20 "mindset." And then these are some excerpts from that,  
21 Dr. Kurokawa's introduction to that Diet report. I say  
22 that Daiichi cannot be regarded as a natural disaster.  
23 It was profoundly a man-made disaster that could have  
24 and should have been foreseen and prevented.

25 Then he said that it was a man-made accident in

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1 Japan. These are some very strong statements  
2 considering that it is in the National Parliament of  
3 Japan. It requires a lot of guts to put that in a very  
4 polite society like Japan. That's why I salute Kurokawa  
5 for this.

6 And then these are two other excerpts from that  
7 that he says that we -- in Japan, we failed to learn  
8 from Three Mile Island and Chernobyl. In fact, he was  
9 talking about Kemeny report, Rogovin report that you  
10 mentioned to it, and also Chernobyl report by IAEA, and  
11 others. Then, of course, he talks again the issue of  
12 the mindset over there.

13 This is very interesting. If you look at the  
14 National Diet report, the way that I studied that myself  
15 with my students, it's very revealing. It's really a  
16 seminal report.

17 And now I want to take you to another issue  
18 which is related to that. You have heard about  
19 Fukushima Daiichi and Fukushima Daini. I have asked  
20 this question all over. I have asked it from many  
21 audiences in different conferences and that, have you  
22 heard about Onagawa nuclear plant? The typical answer  
23 is -- some people say yes, the majority of the audiences  
24 that I have asked that question, they say no.

25 In fact, we had a conference about the economic

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1 effect of the great Tohoku accident in USC in June.  
2 There were a lot of people from Japan that I asked that  
3 question from them, and only a few of them have heard  
4 of, I don't know why.

5 Well, maybe the reason is this: Look at this  
6 map, please. This is very, very interesting, and it's  
7 going to be revealing for you. This was Daiichi. This  
8 was Daini. You have seen that over here, and this is  
9 Onagawa. But you haven't heard or many people, they  
10 haven't heard about that. And I will tell you later  
11 that this plant, as you see over here, was 60 kilometers  
12 closer to the epicenter. Tsunami height was one meter  
13 higher, but we haven't heard about that.

14 This is very interesting, and Fukushima in a NAS  
15 committee report that has done a good job, beautiful  
16 report, but it doesn't do justice to this question in my  
17 judgment, and I think there should be like a sequel or a  
18 complement to that report, about specifically about  
19 Onagawa.

20 And by the way, I wrote an editorial which was  
21 published in the Japan Times, the day before yesterday,  
22 I have a copy of it, which is I'm going to submit that  
23 to you as part of the record, specifically about  
24 Onagawa. There is also another article that my students  
25 wrote about that.

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1           This is, again, another map of Japan that shows  
2   you the location of Onagawa. It's more detail over  
3   there. Here is epicenter, and this is interesting that  
4   this map was sent to us by this gentleman from Japan  
5   after my student article appeared in Japan Times. This  
6   is my former Japanese student, extremely bright student  
7   by the name of Airi Ryu. I encouraged her to work on  
8   this term paper for my class last fall. The title of  
9   her term paper was "Nuclear Safety Culture in TEPCO and  
10   Tohoku Electric Power Company, the Root Cause of  
11   Different Fates of Fukushima Daiichi Plant versus  
12   Onagawa."

13           And this is her receiving the Discovery Medal at  
14   the last May commencement. She now works for Bloomberg  
15   in Tokyo. Brilliant, brilliant student. She accessed a  
16   lot of Japanese documents that our National Academy  
17   report and others didn't have resources to study that.  
18   That's why I think her paper, which is posted on our  
19   website, and that is one of the seminal reports about  
20   Onagawa. Undergraduate USC. I should plug my  
21   university here.

22           A short copy of her paper got published in the  
23   prestigious Bulletin of Atomic Scientists last March on  
24   the anniversary of Fukushima, the title of that  
25   "Onagawa: The Japanese Nuclear Power Plant That Didn't

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1 Melt," and then a longer version of that, as you see  
2 over here, got published in Japan Times.

3 And this article generated a lot of response to  
4 us, those photos and that that I showed to you. People  
5 sent it from Japan to us. And this is something that  
6 I'm going to now concentrate, why you haven't heard  
7 about Onagawa.

8 Let's give you some information, this  
9 information, by the way, is by my student, I didn't know  
10 how to do it. It's great. Daiichi and Onagawa, let's  
11 look at that. The nuclear power plant. They are both  
12 -- Daiichi had six reactors, BW, boiling water reactor.  
13 Onagawa had three reactors, boiling water reactor.

14 Their commission engaged with construction is  
15 always the same. Their regulatory oversight is always  
16 the same. Ministry of Economy, International Trade and  
17 Industry, and then this Nuclear Safety Agency or  
18 something, Nuclear Industrial Safety Agency.

19 In that case, you see that these two plants,  
20 they are the same age, the same vintage, the same  
21 regulatory oversight. See that basically I tried to go  
22 selection by elimination. It puts the regulatory  
23 oversight common to these.

24 If we can attribute that to the regulatory  
25 problem, they have the same oversight, but let's look at

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1 this. Onagawa was 60 kilometers closer, and tsunami was  
2 higher at Onagawa, almost one meter higher than  
3 Fukushima. In that case it was -- it should have been  
4 more vulnerable. And then when you look at IAEA report,  
5 this is a direct quote from IAEA, which Airi has quoted  
6 in her paper. It was the closest nuclear power station  
7 to the epicenter, and the strongest shaking that any  
8 nuclear power plant has experienced in history, and it  
9 was shut down and was remarkably undamaged. Remarkably  
10 undamaged. This is the report of IAEA.

11 We got this photo, again, by this gentleman  
12 Woody Epstein from Japan. This is the city of Onagawa  
13 before the earthquake and tsunami. This is that  
14 location after that. It was devastating, as you see  
15 over there. But I think this is the key to  
16 understanding Onagawa's success. If you look at that  
17 every year, 1970, 1987, 2002, they basically had some  
18 estimate for the tsunami value, and they constantly  
19 learned and they increased the height of the wall. They  
20 learned from Indian Ocean tsunami, they improved their  
21 defenses. They learned from Chile tsunami, they  
22 improved their defenses. They constantly learned, and  
23 remember that Onagawa, please remember, that belongs to  
24 a different utility called Tohoku, whereas Daiichi and  
25 Daini that they belong to TEPCO. I want to come back to

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1 that.

2 This, again, was sent to us by Mr. Woody Epstein  
3 in Japan after that article got published in Japan  
4 Times. That basically says that the man who created  
5 Onagawa, he insisted for a much higher layer of  
6 defenses, and he is able to raise that in 1968, and  
7 finally they raised that to 15, but there's all this  
8 detail is in my student's paper.

9 This is a very -- let me give you, this one is  
10 even better. It's very interesting. When the  
11 earthquake happened, people were evacuating. They were  
12 escaping from Daiichi and Daini, but Onagawa was the  
13 only plant that had the power -- that's why the evacuees  
14 that they lost power to their home, they came, they took  
15 refuge in the gymnasium, in the gym of the Onagawa.

16 It's really a very ironic fate that people  
17 escaping from nuclear plant, because of the accident  
18 over here, it was becoming a refuge for the people,  
19 because they had power and water. That's a very  
20 interesting photo that we gathered some 300 people at  
21 that -- that stayed in this for several weeks. Here, I  
22 think this one, also, is a better photo of that, that  
23 they had 300-plus people, local residents, that lived in  
24 the gymnasium of Onagawa for several weeks because they  
25 had water, power and food. That's another comparison of

1 Onagawa and Daiichi that we put together for you.

2           The owner of the Onagawa is Tohoku. The owner  
3 of Daiichi is TEPCO, and this is the tsunami risk  
4 characterization. Basically this is what one of my  
5 colleagues, Professor Costas Synolakis, who is one of  
6 the world experts in tsunamis, he is my next-door  
7 colleague at USC, he said that in an interview to New  
8 York Times, what TEPCO people did with respect to the  
9 risk analysis of the tsunami "was a cascade of the  
10 stupid errors that led to the disaster."

11           This is the way they did the estimation of the  
12 tsunami, based on Costas Synolakis, who is a world  
13 renowned expert of tsunamis. He runs our tsunami  
14 research center.

15           And in the case of Onagawa, they were proactive.  
16 They initial construction was ten meter elevation, and  
17 they were underestimating tsunami level, and they  
18 constantly increased that to 14.7 meter.

19           This is a very good comparison from the National  
20 Diet report about the way that TEPCO and Tohoku they  
21 addressed tsunami risk. I would like you to look at  
22 this quote from the National Diet report, which is very  
23 interesting. Basically when it came to risk of tsunami,  
24 "TEPCO resorted to delaying tactic such as presenting  
25 alternative scientific studies and lobbying." Basically

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1 they fought for improving their safety. They  
2 resorted -- this is the direct quote from Dr. Kurokawa's  
3 report.

4 Now, let me, and then, of course, in the case of  
5 Onagawa, they learned from Chile tsunami and they  
6 constantly and continuously improved their counter  
7 mission.

8 Let me say something about Daini, also. Daini  
9 was a plant. This is my article the day before  
10 yesterday in Japan Times, it is mostly about Daini. In  
11 fact, I start by talking about the Navy Admiral in that  
12 article. That's Admiral Togo, but not submarine.  
13 That's a talk about Russo-Japanese War of 1904 and what  
14 Togo did over there.

15 This is, again, that thing, and remember, Daini  
16 is 20 kilometers closer to Tokyo. And Daini had four  
17 nuclear reactors operating at the time of earthquake and  
18 tsunami, and they had also station blackout, but then  
19 they had that 420-kilovolt pylon study outside the  
20 plant.

21 The superintendent of Daini, a Mr. Masuda, and  
22 200 workers, we met him, he gave a presentation to us.  
23 They worked heroically in order to save their plant, and  
24 a committee report acknowledged that, but I still,  
25 that's an epic story that needs to be told. That's what

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1 I tried to highlight that in my Japan Times article.

2 Basically this is what our committee said, which  
3 is music to my ear because many people say that human  
4 operators are the weakest link in the chain. I say no.  
5 They are the first layer of defense and last layer of  
6 defense when something goes wrong in a technological  
7 system. I have seen that in aviation industry. I have  
8 seen that in nuclear power industry. I have seen that  
9 in petrochemical refining and other high hazard  
10 industry.

11 These are some quotes from our National Academy  
12 report, but there are some -- there is one quote that I  
13 would like you to pay attention to, that's last line,  
14 that talks about Daiichi, but it applies even more to  
15 Daini. The way that they saved the plant. They were  
16 able to bring the four operating reactors to the cold  
17 shutdown, by laying out nine kilometers of cable that  
18 typically takes 20 days to do, they did it in almost 24  
19 hours.

20 By flexibly using emergency operating procedure,  
21 by improvising decision-making. There was a good  
22 article in Harvard Business Review, also, by Chuck  
23 Casto, who was a resident representative of NRC during  
24 this accident over there and a Harvard Business School  
25 professor that shed some more light on that.

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1           And what Masuda and Daini and his personnel they  
2 did, they did impromptu but prudent decision-making and  
3 improvisation. That is what I mentioned flexibly  
4 applied, it is what he told me, emergency operating  
5 procedures. Temporary cable line, this is a direct  
6 quote from him, by the way, which it typically takes 20  
7 personnel and a month to put.

8           We met Mr. Naohiro Masuda in his office over  
9 there. By the way, Mr. Masuda and his 200 people, I  
10 asked him, how long did it take you to find out your  
11 family were alive and survived? He learned about that  
12 after almost 24 to 36 hours, but they stayed over there  
13 and they worked, and this is his cot in his office, that  
14 he slept on this cot and lived in this office for almost  
15 three, four weeks.

16           This is the man that I called him in my article,  
17 he should be considered as a national hero of Japan in  
18 21st Century, the same that Admiral Togo was considered  
19 as a national hero of Japan in 20th Century.

20           Now, I want to come to the finale of my talk,  
21 and this is the man that I admire and there's a photo of  
22 him on the wall of my office. This is my submarine  
23 photo with no submarine in it.

24           This slide is given to me by one of my nuclear  
25 Navy friends, Mr. Bill Blunt that works now -- he was at

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1 Diabolo County and now he's at Amgen. If you see that  
2 this is basically the report on performance of Nuclear  
3 Navy. This is what Nuclear Navy for the right reason is  
4 proud of. This is what they have done successfully,  
5 thanks to this gentleman. But Admiral Rickover said  
6 this statement, and I would like for the record to read  
7 this statement because when I was watching Mr. Tony  
8 Hayward, BP, CEO of Halliburton, CEO of Transocean,  
9 sitting before the Congress in a table like that  
10 testifying, and they were doing this pointing fingers to  
11 each other for the blowout, that reminded me of the  
12 truth of Rickover's statement, and I would like to read  
13 it to you.

14 By the way, this one is on the wall of my  
15 office. Next to his statement by Valery Legasov, who  
16 investigated Chernobyl, who was a member of National  
17 Academy of Science of Soviet Union, and then he  
18 committed suicide on the second anniversary of  
19 Chernobyl.

20 He made a statement that we didn't learn lesson  
21 in Soviet Union from Three Mile Island and from Bhopal,  
22 and this statement is sitting side by side. That's a  
23 statement you might want.

24 Responsibility, I would like to -- I have less  
25 than one minute or two minutes. I would like to use

1 this finale to finish it, because this, to me, captures  
2 everything that I do or I said in a much more beautiful  
3 way. "Responsibility is a unique concept. It can only  
4 reside in inherent single individual. You may share it  
5 with others, but your portion is not diminished. You  
6 may delegate it, but it is still with you. You may  
7 disclaim it, but you cannot divest yourself of it. Even  
8 if you do not recognize it or admit its presence, you  
9 cannot escape it.

10 "If responsibility is right for yours, no  
11 evasion or ignorance or passing the blame can pass the  
12 burden to somebody else. Unless you can point your  
13 fingers at the man responsible when something goes  
14 wrong, then you never had anyone really responsible."

15 And the most interesting thing, I want to finish  
16 with this note, is when I learned when he said that. I  
17 had this quote on my wall. Last week before coming  
18 here, I said this to my Navy -- Nuclear Navy friends. I  
19 said, please check the quote if it's good, the Ts are  
20 crossed, no errors are in there. Two of my Navy  
21 friends, Richard McPherson and Tom Herring, they said,  
22 no, the quote is good, but the source of that or the  
23 reference for that is even much more amazing and much  
24 more related to this meeting.

25 Admiral Rickover said this quote in a public

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1 hearing and testimony before a Congress panel in  
2 Congress, when that he was asked about the SL1 nuclear  
3 reactor in January 3rd, 1961. They were asking him if  
4 that accident could happen at civilian reactor, and he  
5 made this statement without preparation or something.  
6 That's the reference for this statement.

7 I have another one that I want to finish with  
8 that, but I would like to come back to it because I want  
9 to finish my talk with the submarine photo. This is a  
10 statement that I learned from my colleague, Bill Hoyle  
11 from U.S. Chemical Safety Board. It's a title of a  
12 paper that was presented in Australia. Of course, this  
13 is a paraphrase of the late Peter Drucker's philosophy,  
14 Culture Eats Strategy for Breakfast, but this, I think,  
15 captures some of the discussion that we have over here,  
16 particularly about Onagawa versus Daiichi, and really I  
17 think culture eats systems for breakfast, if we don't  
18 take that into account.

19 Again, as I said, I want to finish my talk with  
20 a photo of submarine here. Thank you.

21 DR. WINOKUR: Thank you very much. Thanks for  
22 an excellent presentation. I'm going to start by asking  
23 you a couple of questions. That last one, I'm not going  
24 to ask you to switch to that slide because you want to  
25 stay on this one. Does culture eat leaders for

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1 breakfast?

2 PROFESSOR MESHKATI: I'm sorry, could you please  
3 repeat that question?

4 DR. WINOKUR: Does culture eat leaders for  
5 breakfast?

6 PROFESSOR MESHKATI: Wow. That's a very  
7 profound question. I would say yes, definitely if  
8 leaders are green and brown, but no if leaders are  
9 seasoned and experienced.

10 DR. WINOKUR: Okay.

11 PROFESSOR MESHKATI: I think that's a very  
12 profound question. By the way, I have seen that myself  
13 in some organizations that I have dealt with as a  
14 consultant, as an instructor and that a new leader came  
15 and tried to change the safety culture, or for that  
16 matter organizational culture and safety culture, and  
17 that leader was eaten alive, literally, by the culture.

18 DR. WINOKUR: Yeah, that's what I'm trying to  
19 get to and understand better, and that is that I  
20 understand how these incredible leaders create culture,  
21 how Admiral Rickover created a culture, how Steve Jobs  
22 created a culture at Apple, how Fred Smith created  
23 FedEx, but I'm just wondering what it takes to come in  
24 and change an existing culture, and, of course, the DOE  
25 culture, and DOE labs have done phenomenal stuff, but

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1 DOE's culture has been established for, you know, since  
2 50, 60 years, and it has many, many accomplishments, and  
3 many and wonderful things it's done, and it accomplished  
4 many of those things because it had a certain kind of  
5 culture, and now we may be asking leaders to come in and  
6 change that culture to be a slightly different culture,  
7 maybe to be less risk-adverse, and it seems to me like a  
8 major challenge for leaders to be able to do that.

9 PROFESSOR MESHKATI: It is absolutely, Mr.  
10 Chairman, a big challenge. I can tell you one example  
11 from my own experience with a major water utility in  
12 Southern California, a new leader came, tried to change  
13 the culture. In this particular case, I had them, with  
14 some of the studies and some of the work over there, the  
15 strategy that we chose, as you know, water utility are  
16 very deep -- they have deeply entrenched culture. Very  
17 much -- utility industries are very deeply entrenched.  
18 Water utilities even more.

19 The approach that we took was basically a  
20 top-down, bottom-up approach. You need to start from  
21 the top, the leader needs to lead, but at the same time  
22 you need to work with the rank-and-file from the bottom.  
23 This is the discussion that I think Mr. Sullivan asked  
24 Admiral Eccles and that about the commander and the  
25 troops, if they -- don't agree or disagree.

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1           I think it's a very difficult, delicate thing,  
2   but it cannot be unilaterally done and instilled from  
3   the top if you don't at the same time simultaneously try  
4   to build it up from the bottom up. That's why I  
5   consider that. It's a simultaneous approach from  
6   bottom-up and top-down approach for culture change.

7           DR. WINOKUR: You talked to us about the  
8   different Japanese leaders of these different power  
9   plants, some we know, maybe two of them were fairly  
10   successful. They didn't do as well at Daiichi as they  
11   did at the other plants. Is there something different  
12   about the Japanese concept of safety culture than it  
13   would be with the U.S. concept of safety culture? I  
14   mean, could we view them in a similar way?

15           PROFESSOR MESHKATI: That's another excellent  
16   question. I have been struggling with the issue of  
17   cultural context of nuclear safety culture for the last  
18   15, 20 years. In fact, I have a book chapter published  
19   in 1997, its title is Cultural Context of Nuclear Safety  
20   Culture, because when IAEA came with INSAG 1 and then  
21   INSAG 4 after Chernobyl about safety culture, they don't  
22   talk about national culture, but then the Fukushima  
23   issue raised that, and then for your information, and  
24   for the record, International Atomic Energy Agency  
25   hosted a meeting last April, it was called Cultural

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1 Factors and Its Impact of Safety Culture, and I had the  
2 privilege to be invited and gave a talk over there.

3 This is a very important issue, Mr. Chairman,  
4 and more than nuclear industry, as you may know,  
5 aviation industry has been struggling with that for the  
6 last, I would say since 1977 Tenerife accident, when two  
7 747, KLM and Pan American, they had a runway incursion  
8 in March '77 on Tenerife. And then another aviation  
9 accident which was Avianca Flight 052, Korean airline in  
10 Guam, and the last one Asiana 214 in San Francisco.

11 The issue of role of cultural factors in safety  
12 culture still is a very hot topic. I have written about  
13 that. We published the stuff on that. I want to make  
14 this story short, I think there is something out there.  
15 For example, in safety culture, we talk about one of the  
16 biggest element of safety culture that both U.S. NRC,  
17 and INPO, they raised that, it's called questioning  
18 attitude.

19 Questioning attitude is one of the pillars of  
20 safety culture. IAEA has it as one of the three  
21 pillars. There are certain cultures, national cultures  
22 that questioning attitude cannot be nurtured or it will  
23 be stifled, and using Hofstede's model, power distance,  
24 the higher the power distance in the society, it impacts  
25 and it stifles the questioning attitude.

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1           One of the contributing factors for the accident  
2 of Avianca Flight 052 was the lack of questioning  
3 attitude in the cockpit, according to the late Bob  
4 Helmreich of this Latin culture, the Colombian culture  
5 of cockpit.

6           Back to excellent question, I would say that  
7 Japan society collectivism, politeness and the power  
8 distance could have played an important role over time.

9           DR. WINOKUR: Yeah, and I'll end my question  
10 with just a statement, the way that somebody explained  
11 it to me, or what I read said that in the United States,  
12 the squeaky wheel gets the grease. In Japan the saying  
13 is the nail that sticks up gets hit by the hammer.

14           PROFESSOR MESHKATI: Excellent.

15           DR. WINOKUR: So, it will have a little bit of  
16 an impact on that questioning attitude. Alright, let me  
17 move to Ms. Roberson.

18           MS. ROBERSON: Thank you, Mr. Chairman. I  
19 wanted to do kind of a cross-section of the leadership  
20 for the Fukushima event and the three nuclear power  
21 plants. So, you have quite a bit of admiration for the  
22 superintendent at Daini. And I'm assuming you also had  
23 the opportunity through the review and evaluation to  
24 understand the superintendent at the other two plants.

25           So, what was the difference in leadership? For

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1 instance, if you had swapped the superintendents at  
2 Daiichi and Daini, do you think the results would have  
3 been different at Daiichi?

4 PROFESSOR MESHKATI: That's -- wow. I think the  
5 superintendent of Daiichi, I think it was Mr. Yoshida,  
6 also, there -- there is a very good analysis of his  
7 decision-making, which was again very, very heroic, done  
8 by Mr. David Lochbaum from the Union of Concerned  
9 Scientists, in his latest book on that.

10 I think David -- in my judgment, again, this is  
11 my reading, based on my reading, I think Daini and Mr.  
12 Masuda had the luck of that 420-kilovolt pylon standing  
13 over there, but he used his ingenuity and improvisation  
14 to the maximum. That's my judgment.

15 Daiichi, they didn't have that element of luck  
16 as well as I remember, and -- but they still worked very  
17 hard. They still worked very hard. Again, this is my,  
18 Naj Meshkati's humble opinion. I think in that  
19 particular case, it wouldn't make any difference.

20 MS. ROBERSON: It wouldn't have made a  
21 difference.

22 PROFESSOR MESHKATI: Again, this is my  
23 speculation, of course. Had Masuda was in Daiichi, I  
24 think because of that 400 -- that 420-kilovolt live  
25 offsite power, that made a big difference. But what

1 made the big difference, which I tried to explain in my  
2 focus in my Japan Times commentary, Ms. Roberson, is  
3 really at the end of the day, it was not automation, it  
4 was not PRA, it was not expert system that saved the day  
5 at Daini. It was the human operators, that they  
6 improvised and they literally rewired the plant.

7 I tell my USC students, just to imagine under  
8 what condition that they did that. The water in some  
9 cases was still up to here (indicating) and there were a  
10 lot of debris, wire and hazardous material lying over  
11 there. I told my students that it's not like you take a  
12 piece of wire to run from my office on campus to the  
13 cafeteria. They did it in a most dire, difficult  
14 condition.

15 Coming up with that solution, that's another  
16 thing which was remarkable, but at least they had this  
17 pylon standing there, and then they used that and they  
18 rewired it. But that's a very profound question.  
19 That's deserving of dissertation by itself.

20 MS. ROBERSON: One other question. One of the  
21 things that seems to come up in investigations of  
22 organizational accidents like Colombia, Fukushima,  
23 Deepwater Horizon, is an organization's failure to  
24 manage changing conditions. While a lot of people are  
25 tempted to view this as a process failure, the recurring

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1 nature of the weakness suggests it's a fundamental  
2 weakness in leadership. Is the ability to effectively  
3 recognize and manage change, changing conditions an  
4 essential element of effective leadership?

5 PROFESSOR MESHKATI: In my judgment, exactly. I  
6 mean, if you remember that slide about what Tohoku  
7 executives, what did they learn from past tsunami? How  
8 did they incorporate that risk analysis done? And  
9 improving their defenses, in order to protect their  
10 plant better. Again, that plant was 60 kilometers  
11 closer to the epicenter, tsunami was one meter higher.

12 I think it was exactly, because their original  
13 wall of defense against tsunami wasn't that high. They  
14 constantly managed that change, and they improved from  
15 that, rather than miss reinterpreting the science and  
16 resorting to lobbying. They managed it beautifully.

17 That's what I think, that's a good example that  
18 your statement is very, very pointed.

19 MS. ROBERSON: Okay. Thank you.

20 DR. WINOKUR: Mr. Sullivan?

21 MR. SULLIVAN: Thank you, Doctor, and thank you  
22 for coming today. I really appreciate it. How is your  
23 football team at USC going to do this year?

24 PROFESSOR MESHKATI: Can I take a fifth on that,  
25 sir?

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1 MR. SULLIVAN: Yes, you can. There's got to be  
2 a game like on Saturday, and you're here.

3 PROFESSOR MESHKATI: That's another good answer  
4 there, implicit answer.

5 MR. SULLIVAN: I want to ask a question that I  
6 think is kind of related to what Ms. Roberson just asked  
7 you, when she was talking about swapping the leaders,  
8 and you called her question very profound, so I will  
9 just try to copy it and change it a little bit.

10 But if you could, if we had a time machine and  
11 you were the consultant and you go back ten years and  
12 show up at TEPCO and talk to the leaders, other than  
13 convincing them that you had a crystal ball that said  
14 there would be a 13-meter high wall of water, what do  
15 you -- what do you tell them? How do you -- how do you  
16 go into that scenario again? So, this would be roughly  
17 middle of the last decade at TEPCO. You have the  
18 mindset that you -- that ultimately we know existed,  
19 what do you tell them? How do you try to change it?

20 PROFESSOR MESHKATI: I tried that, sir. In  
21 fact, when the Tokaimura Nuclear Processing Plant  
22 accident happened in September 1999, I had an article in  
23 Los Angeles Times looking at the root causes of that,  
24 September 1999, got reprinted in Japan Times. And at  
25 that time, then on the anniversary of that, I had

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1 another article in Japan Times. Its title was Japan  
2 Needs to Commence Nuclear Safety Reform.

3 And in 19 -- around 2001 or 2002, four  
4 executives of TEPCO, they resigned in disgrace because  
5 of falsification of data. And I had another article in  
6 2007, after Kashiwazaki earthquake, they also, again,  
7 they came dirty-handed.

8 The problem is this: Again, I'm on the record  
9 that I've said that at least what was the problem at  
10 Tokaimura, what lesson could be learned, what Japan  
11 should do.

12 Sometimes I think that I carry Cassandra's curse  
13 and nobody believes that, which is obvious, but a man  
14 looking like me nobody believes, but -- but going back  
15 to, again, your profound question, Japan is a developed  
16 country. It's a first-rate country. However, when it  
17 comes to the regulatory system industry, the  
18 relationship between regulator and industry, I think, is  
19 a perfect textbook example for regulatory capture.  
20 Perfect and textbook example. And lack of independent  
21 oversight regulator, something else that they have it,  
22 they call it "Amakudari," unholy alliance, between the  
23 METI industry and some other groups over there. That is  
24 what we see the result over there.

25 If they would have listened to me 10, 15 years

1 ago, I say that TEPCO should have gone to a major  
2 massive culture change. Again, I did some work with  
3 another utility in Japan, which is called KEPCO, Kansai  
4 Electric Power Company. They have a reactor in the city  
5 of Tsuruga called Mihama. Mihama had a major steam  
6 generator rupture accident in around 1992 or so, but  
7 they massively learned from that. They created, Mr.  
8 Sullivan, they created Institute for Nuclear Safety  
9 System. That's why I went there in 1999 and then 2009  
10 to that institute because it was created by KEPCO to  
11 learn lessons from Mihama accident. They put that steam  
12 generators in the -- in a glass to -- they made a museum  
13 of that accident.

14 It was, by the way, part of my original slide  
15 that my dear colleague, Dr. Douglas Minnema (inaudible),  
16 cut it out from this presentation, because it's too  
17 long.

18 But that was what KEPCO did, learning lessons,  
19 managing to change. However, TEPCO was misinterpreting  
20 or -- I mean reinterpreting science and resorting to  
21 lobbying. My advice with them is at least look what  
22 your neighbor, KEPCO, did, become better KEPCO people,  
23 rather than falsifying record, lying to the public, and  
24 then resigning in disgrace. I still have a photo of the  
25 fourth TEPCO executive bowing to public and they

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1 resigned in disgrace because of falsification of data.

2 MR. SULLIVAN: So, just to follow-up, let me  
3 more or less give you the same question with respect to  
4 the BP incident, and whether it was BP and/or  
5 Halliburton, just imagine it was, again, 2008 or so.  
6 So, it's before the actual accident, and you have an  
7 opportunity with your crystal ball to talk to the  
8 leaders of those companies. So now there's no element  
9 of Japanese culture here, whatever that might be.

10 Do you tell them anything different in terms of  
11 how you just answered the question with respect to --  
12 with respect to TEPCO?

13 PROFESSOR MESHKATI: In the case of BP, I admit  
14 I have a little bias because at a very important  
15 meeting, I was with the State Department for a year and  
16 a half. I was at a meeting in Athens at the Track II  
17 Diplomacy Conference, and I met a very high-level  
18 British person. That individual, it was almost a month  
19 and a half ago, a month and a half after the BP  
20 Deepwater Horizon, around June 2010 or so.

21 That individual told me a story about the motto  
22 of Lord Browne, who used to be the CEO/president of BP  
23 before Mr. Tony Hayward. His motto was a line from  
24 Oscar Wilde that I have memorized. He said this is what  
25 he instilled in his executive. The motto and the line

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1 goes like this "consistency is the last refuge of  
2 unimaginative. Consistency is the last refuge of  
3 unimaginative."

4 This is what his motto. This was his marching  
5 order. This is the way that he ran his company. Mr.  
6 Sullivan, imagine a CEO of a nuclear power aircraft  
7 carrier, he goes on the loud speaker and say every day,  
8 consistency is the last refuge of unimaginative. What  
9 will be the operation on the flight deck?

10 Imagine if a refinery manager, which in the case  
11 of Texas City, unfortunately, they listened, because  
12 their bonus system is also attached to that. It's a  
13 struggle for survival. If I was -- or had the power to  
14 advise, I would say, please remove Mr. Lord Browne from  
15 that position because this motto is doomed to failure.

16 It was under his watch that the Alaska failure  
17 happened. It was under his watch that Texas City  
18 happened in 2005. It was under his watch that the root  
19 causes festered that led to the BP Deepwater Horizon.  
20 That's the role of bad leadership. That's the role of  
21 infested leadership, in my judgment.

22 MR. SULLIVAN: Thank you very much.

23 DR. WINOKUR: I want to ask you a question about  
24 learning organizations, because it's always been my  
25 sense that culture plays a very important role in

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1 whether an organization can learn, because if the  
2 workers are always saying, we don't do things that way,  
3 and this is what we're comfortable with, and this is the  
4 way we've always done things and so on and so forth, it  
5 can be very challenging for a leader to come in and  
6 change the organization and make it learn new things.

7 Do you have any sense of that process, of what  
8 leaders might do to be more effective at coming into an  
9 organization that has a very established culture in  
10 helping them learn?

11 PROFESSOR MESHKATI: I have one personal  
12 observation about that, and that's why I was involved  
13 with this organization, and I'm very proud to name this  
14 individual. You remember Metrolink had a major crash  
15 with Union Pacific in September 2008, near Los Angeles?

16 DR. WINOKUR: I do.

17 PROFESSOR MESHKATI: You remember that?

18 DR. WINOKUR: There's a story, but I'm not  
19 telling it to you. I do.

20 PROFESSOR MESHKATI: Tell me off the record or  
21 after the meeting. That accident happened in September  
22 2008. Twenty-five people died. I got there at the site  
23 of the accident like three hours later. I slipped  
24 through the barriers. I wanted to see that so I took  
25 some photos. And it was a horrific, horrific accident.

1 And Metrolink has had similar mishaps and accidents  
2 before that, but unfortunately, that organization didn't  
3 care about that.

4 A year later or a few months later they changed  
5 their CEO, and they brought in Mr. John Fenton. John  
6 Fenton became the CEO of Metrolink. In a matter of two  
7 years, John really converted that organizational  
8 culture. Every single employee from I told you about,  
9 top-down, bottom-up, with senior manager, and Metrolink  
10 is really an umbrella organization. They have multiple  
11 contractors. Their signal is maintained by one of the  
12 train operators and other ones.

13 John Fenton was very successful in doing that  
14 with the assistance of Jim Schultz, that was his advisor  
15 and he was a former Air Force pilot, and these guys,  
16 they really did that culture change. To the point that  
17 the Honorable Robert Sumwalt from NTSB, he led a session  
18 on the safety culture for them, and I had the honor of  
19 sitting in the audience. This is what John Fenton was  
20 able to do in two or three years over there, and it was  
21 successful.

22 DR. WINOKUR: Do you think that one of the  
23 things that helped there was the crash? In other words,  
24 if we look at NASA, they lost the Challenger, lost  
25 Columbia. Typically after an accident that serious, the

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1 workforce is more open to change, and if you get the  
2 right leader in there at the time, do you think that  
3 that's what helps make a big change?

4 PROFESSOR MESHKATI: I think it will make the  
5 big change, but the question is not when the culture  
6 change, which people are more amenable to that, but  
7 sustaining that change.

8 I vividly remember the late astronaut Sally  
9 Ride. She sat in both investigation of Challenger '86  
10 and Columbia, and in the Columbia one, she said, I  
11 vividly remember her words, that I'm hearing the echoes  
12 of Challenger here. See, that is the problem. They go  
13 through this culture change, but then sustaining that  
14 culture change is, again, a leadership issue.

15 And that's, I think, a very important factor,  
16 not reverting back to the old habits.

17 CHAIRMAN WINOKUR: Thank you very much.

18 Ms. Roberson?

19 MS. ROBERSON: I have one -- one question, and I  
20 want to talk to you about worker commitment. I think  
21 it's certainly been my experience everywhere I've been,  
22 and the DOE complex is no exception, it is very clear  
23 that the workers have a strong commitment to the mission  
24 of whatever the requirements are or production  
25 requirements are for where they work, but often they are

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1 much less committed to the senior leaders or middle  
2 management. And I don't know if you've seen that, but I  
3 would say, I've seen that.

4 Is this strong commitment by the workers to the  
5 mission, can that become an enabler for poor leadership?  
6 For instance, if leaders don't really understand the  
7 culture underneath, can the strong commitment to the  
8 mission overcompensate for leadership and actually make  
9 it more ineffective rather than more effective?

10 PROFESSOR MESHKATI: I have seen that in some  
11 cases that I dealt with or I studied that that workers  
12 commitment really could compensate for the bad  
13 technology, bad workstation design, bad procedure or  
14 sometimes bad supervision and leadership. I think  
15 committed workers, they go above and beyond, they  
16 stretch themselves too thin in order to keep system up  
17 and running.

18 I was doing several projects, a research project  
19 in Mexico with several chemical plants, and I've seen  
20 particularly that the term should be called sacrifice.  
21 That the sacrifice of some of the workers they do in  
22 order to keep the operation going in spite of all the  
23 problems that they have.

24 I think this is, again, what lends credence to  
25 what I've said before, that really workers are the first

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1 and the last layer of defense, because many times this  
2 first layer of defense is the technological one, they  
3 don't work, and workers, it's by their flesh and blood  
4 that they become the first layer of defense.

5 MS. ROBERSON: Well, one last question on that  
6 path. In the first session today, our two admirals kind  
7 of laid out a very clear picture of what activities are  
8 undertaken to try to understand the climate, they call  
9 it command climate. We see a lot of surveys that are  
10 done in the industry. Do you think surveys actually  
11 provide a good picture of the climate or culture in an  
12 organization?

13 PROFESSOR MESHKATI: Depends on the survey and  
14 who does the survey. Again, this is my humble opinion.  
15 I have seen some safety culture surveys done on San  
16 Onofre Nuclear Plant that I would give them a C-, on a  
17 good day, as a professor. However, I've seen some  
18 surveys of safety culture, some of them I think done for  
19 your organization, or DOE, by Dr. Sonja Haber, on  
20 Pantex, on the one in Washington, escaped the name,  
21 Hanford. These are very, very credible surveys. Dr.  
22 Sonja Haber does this work for International Atomic  
23 Energy Agency. Her work is very high quality and solid.  
24 But there are some fly-by-night organizations that they  
25 tell or they claim that they can measure safety culture

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1 to two digits after decimal points, and if they do that,  
2 then I have a bridge also in New York to sell you.

3 MS. ROBERSON: Thank you, Dr. Meshkati.

4 DR. WINOKUR: Yes, I want to thank you very  
5 much, Dr. Meshkati, for your presentation, excellent.  
6 We've enjoyed the questions, as you can tell, and now  
7 we're going to move on to Professor and Dr. Sutcliffe.  
8 Welcome.

9 DR. SUTCLIFFE: Mr. Chairman, Ms. Roberson and  
10 Mr. Sullivan, thank you very much for the opportunity.  
11 I'm honored as well to be here, and as Professor  
12 Meshkati talked about his personal reflections, I am  
13 going to say that I guess I'm going to give you my  
14 professional reflections after having studied safety  
15 culture and worked with organizations over the last 20,  
16 25 years. And I accept full responsibility for not  
17 having any quote from Admiral Rickover, and I just want  
18 to say I apologize for that. I think I might have a  
19 little Naval picture somewhere, but anyway.

20 DR. WINOKUR: I'm not making that mistake in the  
21 future.

22 DR. SUTCLIFFE: So, now the question that you've  
23 asked me to discuss relates to leadership and safety  
24 culture, and specifically what's the role of the leader  
25 in establishing and sustaining culture, and I think

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1 today what actually what my presentation is going to do  
2 after having sat here for the whole day in a very  
3 interesting set of sessions is to bring some coherence  
4 to our understanding of what it takes, because I think  
5 the scientific knowledge that we've been gaining over  
6 the last 30 years about safety culture has really been  
7 accumulating.

8 I think it's a very important and interesting  
9 time in understanding -- in in this kind of work, and so  
10 I think hopefully I'll bring some coherence to what  
11 we've been talking about today.

12 So, I want to do two things. One is I want to  
13 first talk about my research and knowledge of safety  
14 culture and particularly what leaders, how they can  
15 enable and strengthen safety culture. And I've got  
16 several models I want to present there. And then I want  
17 to, second, spend a little bit of time talking about the  
18 role of leadership in enabling organizational  
19 adaptability, because I think that's a real critical  
20 issue here because we know that organizational disasters  
21 are often the result of pursuing a particular course of  
22 action in the face of evidence suggesting that we should  
23 change course.

24 And, so, I want to talk about research I've done  
25 in wildland firefighting, suggesting how leaders can

1 play a role and what we should do. And actually, I  
2 think this is really timely because I particularly want  
3 to talk about leadership and the role that leaders play  
4 in sense making. And Professor Meshkati talked about a  
5 recent article in Harvard Business Review about the  
6 Daini plant in Japan, and one of my colleagues, Ranjay  
7 Gulati and Professor Meshkati's colleague, Charles  
8 Casto, just published a paper where sense making was  
9 really critical to the success of Daini, and so I want  
10 to talk a little bit about that.

11 But I want to start by highlighting what we know  
12 about organizational culture and why it's important, and  
13 that is that in part, culture enables this similarity of  
14 approach, outlook and priorities that enable people to  
15 achieve collective sustained responses in complex  
16 organizations. And I know that's a lot of words, but  
17 really, you know, we talk a lot about culture, and my  
18 fear is that we talk about it like it's a thing, and  
19 it's more like a cloud that you put your kind of -- you  
20 can put your hand in it. But you can kind of see it,  
21 but when you put your hand there, you can't really feel  
22 it.

23 So, there are so many definitions of safety  
24 culture. I like this one in particular by Stian  
25 Antonsen, and it's pretty similar to what we've been

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1 talking about today, that culture really is these frames  
2 of reference for meaning and action. They encompass the  
3 skills, beliefs and basic assumptions, norms and customs  
4 and language that members of a group develop over time.

5 So, in a way, culture is a way of seeing and  
6 acting, and it's simultaneously a way of not seeing and  
7 not acting, so culture can be a source of blindspots,  
8 and we talk about that all the time.

9 Of course, the idea of culture is simple, that  
10 we just have to be clear about the values and norms and  
11 beliefs and the kinds of things that we want to see  
12 people do, and we know that that's in complex  
13 organizations, complex technologically, complex  
14 sociologically, that's really, really hard to do.

15 And this morning I think the two admirals really  
16 gave a good sense of how building, shaping a culture  
17 really comes about, and if you think about it, this  
18 particular model, and I'm -- I'm always much better when  
19 I can get up there, but I will try to do it from here.  
20 I mean, essentially, if you think about the story that  
21 Admiral Norton, I think, told this morning about the new  
22 seaman who was helping him take the plane off and they  
23 saw a little bit of oil, and they said, you know, cut it  
24 off, you've got to stop, you're not flying today. And  
25 then the next night, the person was rewarded at a

1 gathering or whatever.

2 I think that is reflected in this particular  
3 model. The idea is that we know, and this is a model  
4 that adapted from Charles O'Reilly, who is a professor  
5 at Berkeley, and I think about this as safety culture,  
6 you can think about it as culture in general. The idea  
7 that leaders have to know what they want, they have to  
8 communicate what they want, and they have to do it  
9 consistently. It has to be salient. People have to  
10 understand it. They have to perceive this is how we  
11 want our leaders want us to act, et cetera.

12 When people are rewarded for those things,  
13 they're likely to redo them. So, that is one way that  
14 we know leaders shape culture. It is by walking the  
15 talk. You know, it is by knowing what you want, saying  
16 what you want, making sure that you're rewarding when  
17 people act in the ways that you want them to act.

18 At the same time, what we know from the  
19 literature over the last 20 years that has been  
20 accumulating, particularly in the area of safety  
21 culture, we know that there are other ways that leaders  
22 enable culture. This particular model was developed by  
23 one of my former doctoral students Tim Vogus, who is a  
24 professor at Vanderbilt University, my colleague Karl  
25 Weick, at the University of Michigan, and I.

1           What we did to create this model is we reviewed  
2 almost the entire literature on safety culture across  
3 industries, and we used a particular form of scholarship  
4 called a scholarship of integration. What we wanted to  
5 know from the literature was what do we know from that  
6 literature? So, this is an analytical model. It is  
7 derived from empirical evidence. What we know about the  
8 commonalities, the elements, the factors that are  
9 associated with strong safety cultures. And what we  
10 learned from that analysis is that -- and I think  
11 actually what I was really happy to hear this morning in  
12 the presentations by the two admirals is they were  
13 really talking about how organizations and how leaders  
14 build the safety infrastructure.

15           I think a lot of Admiral Eccles, the idea of the  
16 SUBSAFE program, was really oriented to this creating a  
17 safety infrastructure, and what I mean by that is, you  
18 know, creating a safety management system, an operating  
19 management system that is composed of, you know,  
20 standard operating procedures, training requirements.  
21 And it's very, very complicated when you look at  
22 organizations, they create this -- this system, the  
23 requirements for how are we going to audit, how are we  
24 going to monitor, what are we going to reward people  
25 for, what are the leadership and supervision

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1 requirements? All of that goes there.

2 That is a huge way that people, that culture  
3 gets shaped and reshaped over time. And that, also, is  
4 part of, you know, those actions, how much we're putting  
5 into training, how much -- you know how are we  
6 developing our training programs over time, you know,  
7 what are we doing with respect to audits and all those  
8 kinds of things. Those are visible to people, and that  
9 shows leaders' visible commitment to safety.

10 The other thing that we know is that leaders in  
11 the organization really want to develop safety  
12 information systems, you know, informations for  
13 collecting and disseminating safety information, and,  
14 you know, that's reporting requirements, statistics, all  
15 of the kinds of things that -- that people talked about  
16 today.

17 We also know that a big part of the way that  
18 leaders enable safety is by empowering people to speak  
19 up and act in ways that promote safety. And then  
20 there's this issue that we've talked about a couple of  
21 times today, and that is, that -- is there a safety  
22 climate that has developed? And that means that leaders  
23 have to go about and really assess, are people getting  
24 it? And that's -- that's a big part of the way that  
25 leaders go about enabling.

1           Of course, in our model, you know, as we wanted  
2 to show here is that it doesn't stop there. It's that,  
3 of course, you have to understand and you have to make  
4 sure that people are acting in the ways that you want  
5 them to do, that they are following standard operating  
6 procedures and policies, that they're disclosing  
7 concerns, that they're learning, that they're mindful of  
8 risks. That all goes in our enact section here.

9           And then, finally, we know that strong safety  
10 cultures are shaped by learning, and that, you know,  
11 learning -- we talk about learning loosely here, but the  
12 way that organizations learn is not just about what  
13 people carry around in their heads, learning gets  
14 institutionalized. The lessons get institutionalized in  
15 reshaping policies and procedures, in reshaping the ways  
16 that we go about doing things and reshaping the way that  
17 we want to go about the work.

18           So, that's what this model is, and I think it  
19 represents, I-- I -- actually quite well, what I heard  
20 today, particularly the admirals talking about it and  
21 Mr. Griffon as well.

22           So, what would you see in organizations? Well,  
23 you would see that leaders are directing attention to  
24 safety. They're doing safety rounds. You would see  
25 that they're paying attention to whether people are

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1 speaking up, acting in ways that improve safety, that  
2 they're actively seeking out bad news. Why is that?  
3 Because we know bad news doesn't necessarily travel up,  
4 and we also know that you know about people wanting to  
5 speak up about things that are going wrong.

6 So, you have to be very active. We're  
7 highlighting threats to safety, that people are  
8 mobilizing resources to resolve those threats, that  
9 people are getting feedback about how things are going  
10 and they're revising their practices and what they're  
11 learning.

12 So, on that note, I'll take a drink here. Where  
13 am I on time?

14 DR. WINOKUR: You're good.

15 DR. SUTCLIFFE: I'm good? Okay.

16 So, let me turn now to the related issue of how  
17 leaders enable adaptability, because, as I mentioned  
18 earlier, we know that organizational disasters are  
19 oftentimes the result of pursuing a course of action  
20 when we should change direction, and when evidence shows  
21 that we should do something different, and we know that  
22 leaders play a role in that.

23 And as I said earlier, in part they play a role  
24 because they help people in safety-critical contexts  
25 make sense of what we're facing. And I think that's a

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1 real critical leader role, and if you look at the  
2 Harvard Business Review article on Daini, you will see  
3 that this, you know, taking the 400 whatever -- the  
4 tower, you know, creating this power grid, et cetera, it  
5 wasn't just like, oh, let's do that. It was a  
6 combination of having to make sense of a lot of  
7 different kinds of changing conditions that then led to  
8 those particular outcomes, but the leader was really  
9 critical here.

10           And, so, I am going to talk about some studies  
11 that I've done with Michelle Barton, who is -- was one  
12 of my former doctoral students who is a professor at  
13 Boston University, and we know that, you know, you may  
14 say, well, does this relate to us in the nuclear  
15 business? You know, it is an organizational context  
16 that is very dynamic and very complex and where there  
17 are lots of different entities that have to come  
18 together. We also know that there are cues and  
19 indicators of potential problems that exist and that are  
20 known, and we know that there are clear performance  
21 outcomes. You know your fire can blow up or you can  
22 contain it.

23           And in particular, what I want to talk about is  
24 62 fire incidents that we examined. These incidents  
25 varied in their dimensions with respect to size and

1 outcomes, so the outcomes were sometimes horrific.  
2 People died, and, you know, people had to deploy their  
3 fire shelters and all these kinds of things, and in some  
4 of the other incidents, there were very, very good  
5 outcomes.

6 Now, why am I talking about this? In part  
7 because when we looked at these incidents, and there  
8 were, they were almost equally split between the  
9 incidents that were successful where the fire was  
10 contained and where things really blew up, so almost the  
11 same numbers of each. What we noticed is in the good  
12 incidents that in almost every, in every single one of  
13 those incidents, there was a change in the course of  
14 action. That we didn't just go down this particular  
15 road and, you know, with blinders on.

16 And in the incidents that went bad, what we  
17 found is that in almost every single one of those  
18 incidents, people didn't change course. The leaders  
19 didn't change course. And, so, we wanted to know what  
20 was going on there. And, so, we wanted to know if there  
21 were patterns that we could discern. And, so, you know,  
22 just to lead up to that, you know, if you think about  
23 it, and we have seen this today and Professor Meshkati  
24 talked about this, that in interactively complex and  
25 tightly coupled systems, small mishaps can concatenate,

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1 and they can build up. We heard that this morning, too.

2 And, so, we know that safety requires this  
3 vigilance. You know, and that part of what safety  
4 culture is all about is creating a vigilance so people  
5 can see the small things and they can act with safety in  
6 mind, they can bring up these cues, and that, you know,  
7 we can constantly adapt and redirect what we're doing if  
8 necessary.

9 And, of course, that there is a very big  
10 literature and that was developed by Jim Reason and  
11 myself and Karl Weick about failing to recognize cues,  
12 and that there are weak signals. These weak signals,  
13 you want people to pick up on them, and that disasters  
14 occur in part because of these accumulation of unnoticed  
15 events.

16 So, the implication is -- is that if we notice  
17 these things, we redirect our actions that we will be  
18 safe. But there is also a different, I guess, model or  
19 a different idea, another possible explanation, and --  
20 and that may be is that people fail to redirect their  
21 action, not because they miss cues, signaling the fact  
22 that they should change their course, but because  
23 they're so embedded in the situation, they're so  
24 embedded in what they're doing right now, that they  
25 really fail to kind of step back and rethink what's

1 going on.

2 And, so, we talk about that as dysfunctional  
3 momentum, in that they don't really make new sense of  
4 what they're facing. And, so, what we need sometimes is  
5 to think, perhaps, that we need some kind of  
6 interruption, and actually I know if I went through my  
7 notes again I would find that somebody today actually  
8 talked about this, and perhaps it was one of the  
9 admirals. The idea that sometimes you've got to kind of  
10 step back, and you've got to think about, what are we  
11 facing now? Because we don't oftentimes update in real  
12 time, and, so leaders can play a very big role in that.

13 So, it may be the fact that lack of  
14 interruptions threaten safety, and that we get into a  
15 momentum. If you think about it, momentum is, you know,  
16 it's this idea that we're -- it's a flow of  
17 uninterrupted action, and so you kind of have to stop  
18 the action. It's not necessarily like inertia where you  
19 have to kind of start action. And, so, overcoming  
20 momentum requires the slowing or stopping, and  
21 dysfunctional momentum implies a continuing with a  
22 failing action.

23 So, what motivates and enables individuals and  
24 groups to redirect their action, what prevents it and  
25 what are the implications for leadership?

1           So, let me just talk about what we found. We  
2 found, as we expected, that most instances where ongoing  
3 action was changed and where there were positive  
4 outcomes that it resulted from some re-evaluation of the  
5 situation, and in most instances where action continued  
6 unchanged, it involved little, if any, re-evaluation.  
7 But we also saw, you know, well, we saw this, you know,  
8 these people re-evaluated the action, the test fire was  
9 satisfactory, we applied a few igniters, it was going  
10 bad. I told her I was seeing, you know, we need to shut  
11 it down and we did.

12           These people, we took a test fire. It burned  
13 actively, we were kind of anticipating that, but, you  
14 know, there were five or six more fires that kind of got  
15 lit, and in the end, people got a lot of smoke  
16 inhalation and throwing up and headaches, and it was a  
17 real mess. They didn't change their actions.

18           What we found, though, is that noticing cues  
19 wasn't sufficient. So, if, you know, we talk a lot  
20 about weak signals, noticing cues, not letting these  
21 things accumulate. But we found that noticing cues was  
22 not sufficient to introduce this re-evaluation of the  
23 situation. There were many examples and where  
24 individuals recalled, in fact, noticing cues that  
25 conditions were dangerous or indicators suggested that

1 potential problems, but the approach to the fire  
2 remained unchanged.

3 Now, these people, we knew it was a bad place to  
4 light the fire. It was a steep slope, et cetera. We  
5 knew it was going to be a loser, and, in fact, it was.  
6 So, again, noticing the cues. But there were two social  
7 processes that we found that led to the re-evaluation.  
8 Not surprisingly.

9 One was voicing concerns, and voicing concerns  
10 transmits this critical information. But it's not just  
11 the voicing, because a lot of times people already knew  
12 the information. It was -- it's actually -- I should  
13 say it is just the voicing, that the voicing in a way  
14 creates something that people have to react to. It's a  
15 shared artifact. And, so, the cue may be ephemeral and  
16 uncertain, but it creates this interruption, and it  
17 creates this idea that it has to be acknowledged or  
18 denied and it has to be responded to.

19 So, and this is an example I told my boss we're  
20 experiencing. I didn't feel safe. I guess just by  
21 hearing one person saying that, you know, most people  
22 didn't feel safe in that example, that it was enough to  
23 make him realize that, yeah, this is a safety concern.  
24 It was, in a way, it was like he was waiting for  
25 somebody to say something.

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1           So, what enables this voice? And we've heard  
2 today a lot that, you know, a lot of times people don't  
3 speak up because they're fearful, but oddly enough,  
4 that's not necessarily what we found, and we were  
5 really, really surprised by that. We found that in a  
6 lot of cases, people didn't speak up because they  
7 assumed that other people knew more than they did. And,  
8 so, this perceived expertise also influences voice.

9           And, so, in this case, for example, you know,  
10 I'm not used to questioning him. Nobody is because --  
11 am I running over time?

12           CHAIRMAN WINOKUR: No, you're fine.

13           MS. SUTCLIFFE: He's made consistently good  
14 decisions in gnarly situations for 30 years, and, you  
15 know, I didn't feel comfortable about it, but I had the  
16 least experience of anyone there. So, it was like,  
17 well, it doesn't look right, but what do I know.

18           And, so, we found that that, you know, perceived  
19 expertise was one reason, but we also found that when  
20 people were skeptical of somebody's expertise,  
21 regardless of whether it was a lower-level person or  
22 their boss, that they were more likely to speak up and  
23 voice their concerns, so skepticism was really  
24 important. And, so, that was the one issue, this issue  
25 of voicing concerns, one social process.

1           The other social process that we found was a  
2 process of seeking disparate perspectives. Karl Weick  
3 and I have talked about this as requisite variety, the  
4 idea that you've got to seek discontinuities in order to  
5 create opportunities for re-evaluation, and that we  
6 found that leaders who deliberately sought disparate  
7 perspectives were more likely to interrupt and  
8 re-evaluate their ongoing actions. And as this person  
9 said, you know, I wanted to get input from other people,  
10 too, to see if there were different views, to see if  
11 anybody had a different idea, because, you know, they  
12 have a wealth of experience, and I want to use it all.

13           And what we found that led to that seeking of  
14 disparate perspectives was really something that we've  
15 talked about as an attitude of wisdom, and I think this  
16 is really important to think about with respect to  
17 leadership, that we found that the leaders who had a  
18 sense of humility, that they didn't assume that they  
19 knew it all, that they were more likely to ask for help  
20 from other people.

21           And, you know, we've talked about, Karl and I,  
22 and particularly Karl has written about this attitude of  
23 wisdom, that, you know -- you want to be confident but  
24 not overcautious. It's this balance between confidence  
25 and overcautiousness, that it's this attitude of wisdom,

1 having seen things a lot. And, you know, as this person  
2 said, as old as I am and as experienced as I am in  
3 relationship to these large fires, you know, I know I  
4 don't know it all, and so the next fire I go on to, I'm  
5 not going to go in there full guns blazing.

6 So, what we found really is that there was  
7 likely to be a redirection of ongoing action and a  
8 re-evaluation of the situation if people voiced the  
9 concerns and if they sought disparate perspectives, and  
10 we found that this skepticism of expertise and this  
11 attitude of wisdom led to those.

12 And you can think about it as this opportunity  
13 for sense making and this opportunity to create an  
14 interruption. But I want to do -- I do want to say two  
15 other things, and this goes I guess -- relates to what  
16 Mr. Griffon was trying to talk about today, and that is  
17 that we did find that there were two factors that kind  
18 of interrupted this from happening, and one factor was  
19 political pressure, that people were less likely to  
20 re-evaluate the situation if there was strong political  
21 and power issues going on, and also when people had  
22 individual interests, and that they had a little bit of  
23 wishful thinking, that they really wanted this fire to  
24 go well, you know, they really want it to go well, so  
25 they kind of put blinders on, and they were unlikely to

1 redirect their actions.

2           So, what do I take away from this? I think  
3 safety culture is really critical, and it's critical  
4 because it does sensitize us to what we want to pay  
5 attention to, but also we know that disasters occur not  
6 only because of cultural blindspots, because people miss  
7 cues, but also because they get on a course of action,  
8 and leaders are important because they help people make  
9 sense, and they create interruptions and moments to  
10 reflect and to re-assess on the unfolding story to  
11 determine now what, what are we going to do, and also to  
12 re-orient what they have been doing.

13           So, I will end there and look forward to your  
14 questions. Thank you.

15           DR. WINOKUR: First of all, I want to thank you  
16 very much for the presentation, and I see you've been  
17 taking careful notes and you've integrated a lot of  
18 these thoughts for us, so we'll try to take advantage of  
19 that, and certainly a lot of what you said resonates  
20 with me.

21           I don't know your model well yet, but I can  
22 assure you my staff will force us to learn it, and we  
23 will become more adept at it.

24           Let me ask you a question I asked before to see  
25 if you can give me some insights. We talked before

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1 about the fact that at different levels of an  
2 organization, you had the leaders, you had the mid-level  
3 managers, you had the workers. There were different  
4 perceptions of the culture and how things were going  
5 looking at the situation.

6 What do you think are the causes for that and  
7 what are the causes to start with?

8 DR. SUTCLIFFE: Well, yeah, I think that's a  
9 really good question because I have observed that myself  
10 in some studies that I've done, that there are these  
11 differences, and I actually think that the question --  
12 the answer to your question has come out a couple of  
13 times today.

14 Well, if we think about this work that I just  
15 presented, I think one cause of that may be the lack of  
16 humility, perhaps, but I think this morning, that one of  
17 the admirals talked about the fact that, you know,  
18 leaders have a strategic -- they have strategic  
19 priorities and strategic goals. And, so, they have a  
20 different orientation, and a different perspective on  
21 the organization, so that may lead to some  
22 overconfidence or confidence that we can achieve what we  
23 can do.

24 And also, their, you know, people on the front  
25 lines are seeing more problems day-to-day and the

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1 interruptions and the kinds of things that it takes to  
2 get their work done, so they may be a little less  
3 optimistic.

4 I also want to highlight that what we know from  
5 sociological studies is that there is something called  
6 positive asymmetry in organizations, meaning that  
7 sociologists have demonstrated that it is very, very  
8 difficult to imagine worst case scenarios, and perhaps  
9 leaders are more subject to that. I don't -- I don't  
10 know about that, but I also think that it may signal  
11 that news is not getting to leaders, and it also may  
12 signal that they're not paying enough attention to the  
13 front line, or they're not really down in the weeds.

14 So, you know, those -- there may be actual  
15 differences, and -- and those differences may be a  
16 consequence that the leader doesn't really know stuff,  
17 and that the news isn't getting to him or her. And, so,  
18 I think there -- I mean, I would talk about that as the  
19 reasons.

20 DR. WINOKUR: So, what I take from that, to some  
21 extent, is that one of the values of surveys, especially  
22 from the leader's point of view, is that if you see the  
23 stratification, and if it's strong, and we've seen data  
24 at our previous hearing from NASA about that that  
25 stratification, things typically look a little bit

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1 better at the top than at the bottom. It's a signal to  
2 you, a strong signal to you that you may not know the  
3 rest of the story, you may not be getting all the news  
4 and all the information you need, and it's probably a  
5 very natural process that that happens, right?

6 DR. SUTCLIFFE: I don't know about a natural  
7 process, but I think it's -- I think just from what I've  
8 seen, it seems to be the pattern that we see in  
9 organizations, and I would say that, yeah, that it's a  
10 signal that people need to know more, and I would be --  
11 I mean, I would then be wondering about other things. I  
12 mean, I would want to dive in, definitely.

13 DR. WINOKUR: All right, thank you.  
14 Mr. Sullivan?

15 MR. SULLIVAN: So, thank you for being here  
16 today, Doctor, and thank you for waiting very patiently  
17 all day to have your turn at bat.

18 You know, we time constrained you I think to 25  
19 minutes, so I think out of necessity, you went through  
20 it rather quickly, but when you go through it quickly,  
21 it almost seems kind of simple. It's like, here's a few  
22 graphs, and here's a few traits.

23 DR. SUTCLIFFE: Right.

24 MR. SULLIVAN: I'm thinking it can't possibly be  
25 that simple because there's many examples that we've

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1 heard about today, where we're very smart, very talented  
2 people, they've failed at this. So, if I gave you a  
3 week, could you be sitting here talking about this for a  
4 week? Is it -- it it complex?

5 DR. SUTCLIFFE: I could be talking about it  
6 probably for months. It is extraordinarily complex,  
7 and, of course, I mean all -- most models simplify  
8 things, just as we did in the enable, enact and  
9 elaborate model. You know, it's an analytical model to  
10 give -- and I would like to explain it just a little bit  
11 more in the sense that the model was derived from  
12 looking at the published literature on safety culture,  
13 and the findings that we have found, not we, but, you  
14 know, the collective "we" of collective scholarship, and  
15 the elements that were common to strong safety cultures.

16 So, you know, if you were going to go and take a  
17 look at an organization's safety culture or if you were  
18 establishing a new organization, what are the kinds of  
19 things that you would want to think about, and that  
20 gives you kind of a sense.

21 So, we created it for that reason, but the other  
22 reason is to show that it is a process, that shaping  
23 culture is a process. It is shaped and reshaped over  
24 time. I mean, you could think about it as being  
25 reshaped every moment. You know, every time you're

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1 enacting a new action or taking an action, you're  
2 getting new information, and people are incorporating  
3 it, so it's extraordinary.

4 I believe in complex technological systems,  
5 sociological systems. It's extraordinarily difficult,  
6 and it takes -- it's very, very, very, very hard work.

7 MR. SULLIVAN: So, on your one graph that you  
8 did have with traits that leaders should be showing, I  
9 think I saw the word "consistent" there twice, which we  
10 heard earlier about consistency.

11 DR. SUTCLIFFE: Oh, right, yeah.

12 MR. SULLIVAN: But, my experience, consistency  
13 can be very hard just because rules are finite,  
14 scenarios can be infinite, and so inevitably, you have a  
15 rule that says this. Something comes along where the  
16 rule doesn't make any sense. Alright. We don't have --  
17 you want to talk about complex socioeconomic situations,  
18 we can just talk about raising my own children, and I  
19 ran into this all the time where now you're faced with  
20 you enforce the rule for consistency purposes or do you  
21 open up that Pandora's box of, okay, now we're going to  
22 start having exceptions to the rule.

23 So, what do you tell leaders or prospective  
24 leaders about that?

25 DR. SUTCLIFFE: I think you raise a really

1 important and I think one of the real challenges of  
2 leadership, and I guess the way I would think about it  
3 is -- and I think that people are pretty careful when  
4 they think about culture and building culture, or  
5 shaping culture, about that you want a few key values  
6 that you really want that are invulnerable. But, yeah,  
7 we need to have some -- I mean, there has to be the  
8 capability for resilience, and I think Mr. Griffon  
9 talked about resilience today, and I think Professor  
10 Meshkati would talk about that, too.

11 I mean, we saw that in the -- in the, you know,  
12 Daini and Daiichi. So, you've got -- I mean, I think  
13 you have to think carefully about which things are  
14 invulnerable that, you know, can't be penetrated, that  
15 this is how they have to be, but also people have to  
16 know that you have to be flexible. I mean, doing the  
17 same thing in changing conditions, following a procedure  
18 just blindly is not -- is in my view stupid. And, so, I  
19 think -- I think that it's a balancing act, and I don't  
20 know -- I mean, I had my own problems when I was  
21 associate dean trying to balance certain things.

22 So, I think it's a challenge, and I don't know  
23 that I have a good answer, other than to say that we  
24 have to think carefully about what are the things that  
25 we really want. If you really want people to speak up,

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1 and they speak up, and then they are punished for it,  
2 then that's a huge signal. You know, I mean, if that's  
3 not really of that key value, then we shouldn't be  
4 touting that as a value.

5 So, I think we've got to be careful in the kinds  
6 of things that we say we want, and we probably don't  
7 always do a good job with that.

8 MR. SULLIVAN: Thank you. Well, if it makes you  
9 feel any better, my children always got the best of me.

10 DR. SUTCLIFFE: Okay.

11 MR. SULLIVAN: Thank you.

12 DR. SUTCLIFFE: No, I don't think there's any  
13 good answers for that. I mean, think that's a key  
14 leadership challenge, right, and what leaders get called  
15 on the carpet for is saying, you know, you want this,  
16 and then tomorrow you're doing that.

17 DR. WINOKUR: Ms. Roberson?

18 MS. ROBERSON: Well, actually, thank you so much  
19 for your presentation. I enjoyed it, and you actually  
20 -- I had a series of questions, but you actually  
21 answered most of them during your presentation.

22 But, I mean, you're talking to a room full of  
23 engineers and scientists, so I've got to ask a little  
24 bit deeper. These 60-plus events that were analyzed for  
25 the study, I understand the categorization, but were

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1 there any similarities or dissimilarities across the  
2 line? I mean, was it like regional? Was there, you  
3 know, any difference or were there no differences in the  
4 data set in the more successful, less successful?  
5 Anything you can think of? Yeah.

6 DR. SUTCLIFFE: I mean, we controlled for number  
7 of factors.

8 MS. ROBERSON: Maybe that's what I mean.

9 DR. SUTCLIFFE: Yeah, we controlled for some  
10 factors, and I honestly haven't looked at the paper for  
11 on particularly what we controlled for, but we  
12 controlled for several things, to the extent that we  
13 could, given this particular thing.

14 I mean, we have also done another study, a more  
15 quantitative study that's going to be published in the  
16 Journal of Contingencies and Crisis Management. And in  
17 that paper, we also take a look at sense making. And  
18 the importance of that paper, I think, is that, first of  
19 all, we have 600 observations, so it's a much larger  
20 sample, but what we found there is that leadership sense  
21 making was critical, and that the way that it was  
22 critical is that particularly if people on the line were  
23 trying to hold on to discrepancies, so if people on the  
24 line were socialized to say, we've got to ask each other  
25 questions and, you know, we want to hang onto the

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1 details, and that if leaders were really -- if they were  
2 engaging in behaviors suggesting that, you know, we've  
3 got to somehow think about what does this mean and let's  
4 come together and interpret what's happening here. So,  
5 bringing those things together, it was a huge predictor  
6 of performance, the outcomes of these fires.

7 So, that's why I think that leadership modeling  
8 these behaviors that -- of inquiry, you know, I think  
9 one of the questions that you all asked today, and I  
10 can't remember, it might have been Mr. Sullivan. Well,  
11 I think several times you've asked about technical  
12 competence versus, you know, other competencies, and, I  
13 mean, when I think about what a leaders need or how  
14 would we make decisions on what leaders we want, I would  
15 be thinking about we want leaders who are really going  
16 to be inquiring about things, who are learning oriented,  
17 who want to know about stuff, who have good relational  
18 skills, and as well as deep technical skills, because I  
19 think that's important, too, but it's really this  
20 inquiring and making that salient that we want to figure  
21 this out.

22 I mean, I think that the challenge for safety  
23 critical industries, and we were talking about this at  
24 lunch, is that, you know, risks, and one of the admirals  
25 actually said this today, and I know I have it in my

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1 notes somewhere, but -- is that safety -- is that risks  
2 aren't always objective, and you have to make sense of  
3 things as you're going along, and that that's a process  
4 of really interpretation and talking and negotiation and  
5 stuff like that, and I think we need more skills like  
6 that.

7 MS. ROBERSON: So, where do people get those  
8 skills?

9 DR. SUTCLIFFE: Business schools. No, I'm  
10 teasing.

11 MS. ROBERSON: No, you're not.

12 DR. SUTCLIFFE: No, you know, I am, because  
13 there's this recent book called "Quiet." I don't know  
14 if any of you have read it, but about how we're creating  
15 a culture of extroverts and that introverts can be very  
16 good leaders, but they're not being listened to. But,  
17 no, you know, I'd have to think about that, Ms.  
18 Roberson, because I haven't really studied it, and so  
19 I'm a little reluctant to say anything.

20 MS. ROBERSON: Thank you.

21 DR. SUTCLIFFE: You're welcome.

22 DR. WINOKUR: So, here's some of the things that  
23 I'm trying to understand a little bit better today, and  
24 I hope you take them home as research projects.

25 DR. SUTCLIFFE: Okay.

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1 DR. WINOKUR: But I'm not saying we're funding  
2 it, but I hope so, and maybe they've been answered and  
3 maybe you've heard the answers here today so you can  
4 help me.

5 I'm trying to understand things about leaders in  
6 the sense that some people may believe that if you have  
7 an effective leader in one organization and you  
8 transplant that leader to a different organization, that  
9 they're still going to be effective, and yet I read a  
10 lot of things in the Wall Street Journal or the press  
11 that say, you know, this person was at Xerox and they  
12 were super, and then they were hired by Ford Motor  
13 Company, and they fell apart.

14 What do you think was going on there? Was it a  
15 culture they could not deal with? I mean, they're  
16 obviously great leaders. They led big corporations and  
17 companies with hundreds of thousands of people  
18 sometimes, and yet they were not successful.

19 DR. SUTCLIFFE: Right. You know, that's a  
20 really great question, and actually there's a lot of  
21 research that's developing on that right now, not  
22 necessarily directly related to leaders but related to  
23 taking stars, for example, star financial analysts and  
24 taking them from one organization and putting them in  
25 another where they fail. And so I think there's a role

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1 to the context that really -- and maybe this goes back  
2 to what Professor Meshkati was talking about, you know,  
3 that you've got this bottom-up, top-down kinds of thing  
4 going on and that there is -- the context matters.

5 So I don't believe that you can just take a  
6 leader, and, you know, any leader, and transplant them,  
7 and that they will be successful because there's a lot  
8 of reasons, there's a lot of contextual reasons, a lot  
9 of infrastructure things, a lot of what they learned in  
10 that particular organization that makes them successful,  
11 and, you know, sometimes people can be adaptable, but  
12 sometimes I would say that leaders kind of take a  
13 mindset that they have from one organization, take it to  
14 the other, and that is a totally different culture that  
15 they're entering.

16 You know, at the same time, I think you raise a  
17 really important point because, you know, in order to be  
18 credible, leaders have to kind of look like the people  
19 that they're joining, but at the same time, they want  
20 you to know -- generally organizations hire new leaders  
21 because they want them to do different things, and so  
22 you've also got to do different things, but, you there,  
23 there has to be some kind of balance there, if you're  
24 kind of -- if I'm making sense.

25 DR. WINOKUR: You are. I mean, so the skills

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1 have to kind of be aligned to the organization. You  
2 need to be the right person for the organization at that  
3 time, and I think what you're saying is there's no  
4 universal leader. There's no super-universal leader out  
5 there who can just do anything, who could head a naval  
6 reactors program and then necessarily turn around and  
7 run the Department of Energy or turn around and run  
8 Apple Computer. I mean, it's not likely to happen,  
9 right?

10 DR. SUTCLIFFE: Yes, I agree with you, and I  
11 also think about equifinality, that there are many ways  
12 to the same end, so I think that's important to think  
13 about, too.

14 If I can add on one thing to your question  
15 though, and that is that that isn't to say that  
16 outsiders aren't useful to organizations because I think  
17 organizations can use outsiders in very valuable ways.  
18 I mean, other people bring new insight to organizations,  
19 new ways of doing things.

20 In fact, Jim March, who is a brilliant  
21 organization theorist from Stanford University, you  
22 know, he talks about the value of slow learners in  
23 organizations, meaning when new people come into an  
24 organization and they don't adapt to the culture right  
25 away, that that's a good thing, and that because --

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1 because what it does is it leads organizations to  
2 question some of their assumptions and some of what  
3 they've been doing. So it's a way to introduce new ways  
4 of doing things.

5 DR. WINOKUR: So the other thing I've been  
6 struggling with today is to try to understand whether or  
7 not the culture of safety of one organization can be  
8 transplanted to another. And that's why the Navy is so  
9 valuable to us because they are so capable at what they  
10 do, I think they are, and they have built a very good  
11 culture of safety, maybe even, you know, really  
12 outstanding in the submarine forces. And, you know,  
13 could that culture be transplanted to a very different  
14 diverse organization, which is how I view the Department  
15 of Energy, or maybe some other organization that's also  
16 complex? How do you do that? Can it be done? So, can  
17 it be done?

18 DR. SUTCLIFFE: If you took all of those same  
19 people and all the things they were doing and  
20 everything, maybe, but, no, I don't think so. I mean,  
21 my own view of culture is that organizations are  
22 cultures, and so I don't think you can transplant them.  
23 If you're thinking about transplanting, though, or if  
24 you're thinking about benchmarking or best practices or  
25 thinking about taking of adapting or adopting another

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1 organization's safety management system or, you know,  
2 practices, you might be able to do that. But the way  
3 that I understand culture, it is the organization. The  
4 organization is a culture.

5 I mean, you know, and it's an interesting way of  
6 thinking about it. People talk about organizations  
7 having cultures or organizations are cultures, and I  
8 think that they're both -- that, you know, through  
9 the -- I mean, if you think about what I talked about  
10 with respect to enabling, through the routines, the  
11 daily routines and practices, through the training  
12 systems, through the kinds of education people have,  
13 through the daily experiences that they have, that is  
14 how culture is shaped and built and that means that then  
15 we are a culture. And there are multiple -- I mean, I  
16 think today we heard multiple times that no organization  
17 has one single integrated culture.

18 I mean, there are oftentimes -- there may be  
19 some values and norms and ideas and beliefs that are  
20 similar across the whole organization, but they're  
21 definitely subcultures within any organization.

22 DR. WINOKUR: I mean, the way I think about it  
23 in an analogy is that we're a democracy in America, but  
24 transplanting democracy to the Middle East is not the  
25 same thing. Democracy does not -- is never going to

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1 look the same in the Middle East as it does in America.  
2 There's no way to transplant our system, per se, into  
3 their culture.

4 DR. SUTCLIFFE: No, because they have a culture.

5 DR. WINOKUR: That's right.

6 DR. SUTCLIFFE: I mean, they are a culture  
7 already, yes. So you can't transfer it. Yeah, I just  
8 don't think about it that way.

9 DR. WINOKUR: Thank you. Appreciate it.

10 DR. SUTCLIFFE: You're welcome.

11 DR. WINOKUR: Ms. Roberson?

12 MS. ROBERSON: I don't think I have any  
13 questions.

14 DR. WINOKUR: You don't? Mr. Sullivan?

15 MR. SULLIVAN: So I would just like to ask our  
16 standard question, whether you have any suggestions for  
17 us other than I heard we need to read the book "Quiet"?  
18 Do you have any other suggestions?

19 DR. SUTCLIFFE: Oh, I can give you lots, no.  
20 Yeah, you have asked the question before about, you  
21 know, how if we have suggestions -- and I don't want  
22 to -- I guess I would go back to Admiral Eccles'  
23 comments this morning and I think Mr. Mark talked about  
24 this, too, is that I'm not quite sure about your  
25 relationship with the DNFSB. Oh, no, you are the DNFSB

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1 -- with the DOE. But two things, I do have two  
2 thoughts, though, you can see I have many thoughts.

3 One is that just by doing this I think it's a  
4 signal, and it is a signal that safety is important, and  
5 so I think that's important, just by itself.

6 I think the second thing is that I would be  
7 thinking about -- you know, you talked today about  
8 metrics and ways to assess safety culture, and if I  
9 could say anything, I would say that we need a myriad of  
10 ways to assess culture, that it's not just a safety  
11 survey. Surveys are important to assess the safety  
12 climate. I mean, surveys are a good -- you know, a good  
13 indicator of the surface culture, but I think you've got  
14 to think about other things.

15 And, so, I guess I would be thinking about how  
16 you can give the DOE more tools to not only assess but  
17 to evaluate because what do they do with the data then?  
18 So, you know, are there ways that you can help them  
19 figure out, Well, you know, what does this all mean, and  
20 then also, you know, what are they going to do about it  
21 because sometimes we do these assessments but then we  
22 don't go further. And I think change -- and I know, Ms.  
23 Roberson, you brought change up a couple times, you  
24 know, change, and I've taught change to executive MBA  
25 students for the last 20 years at Michigan before I

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1 joined Hopkins, and it's darn hard.

2 And I've studied change, and, you know, it  
3 takes -- it can take a long time, especially in open  
4 systems. In closed systems where you have more control  
5 over things, and I think Admiral Eccles made this point  
6 this morning -- that in closed systems it might be more  
7 easy to make change, but in open systems that are more  
8 complex, it's really hard. And I'll end on that note.

9 DR. WINOKUR: Thank you.

10 DR. SUTCLIFFE: You're welcome.

11 DR. WINOKUR: Thank you. I want to thank you,  
12 Dr. Sutcliffe. I want to thank all three panelists, Mr.  
13 Griffon, Dr. Meshkati, Dr. Sutcliffe for your valuable  
14 insights into the role of the leaders in organizations  
15 conducting hazardous operations.

16 At this time, it's the Board's practice as  
17 stated in the Federal Register notice to welcome  
18 comments from interested members of the public. Once  
19 again, I understand there are no -- nobody has signed up  
20 to make a public comment. I want to turn to the  
21 audience now and ask if anybody would like to make a  
22 comment.

23 All right, seeing none, I'm going to turn to the  
24 Board Members for their closing comments, and then I  
25 will end with my comments, so let's begin with Ms.

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1 Roberson.

2 MS. ROBERSON: I just want to thank you three  
3 for participating. I actually really learned a lot. I  
4 enjoyed it greatly, and I'm sure it's going to  
5 contribute to our evaluation of any actions we take, so  
6 thank you very much.

7 DR. WINOKUR: Mr. Sullivan?

8 MR. SULLIVAN: I just want to thank you all  
9 again, and I have two books to read. Mark, you need to  
10 pony one up.

11 DR. WINOKUR: Thank you, Mr. Sullivan. Before I  
12 comment on this meeting, I'd like to thank our witnesses  
13 and their organizations for supporting this meeting, and  
14 I want to thank all the members of the public who  
15 participated in this meeting. I want to thank any  
16 Congressional staffers, whether they're here or  
17 listening online, elected officials and other  
18 representatives of state and local organizations that  
19 were able to find the time to join us today. An active  
20 community with engaged leaders is a vital part of any  
21 successful program of this nature.

22 The expert witnesses that appeared before us  
23 today illustrate the wide recognition that an  
24 organization's culture is the key to its ability to  
25 conduct hazardous operations safely and reliably. Our

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1 first session demonstrated that the Navy clearly has put  
2 a significant amount of effort and resources into  
3 creating a culture of safety and using that culture to  
4 improve its operations.

5 Our second session demonstrated that the quality  
6 of an organization's culture has a dominant influence on  
7 its ability to successfully conduct hazardous operations  
8 and that the organization's leaders have an essential  
9 role in establishing and sustaining that culture.

10 Culture is real and culture is really important.  
11 And I want to emphasize this, we have also learned that  
12 establishing and maintaining a robust culture of safety  
13 is not easy. It requires dedication and commitment from  
14 all members of the organization, in particular from its  
15 senior leaders. Creating a robust culture of safety  
16 must not be viewed as another item on a checklist. It  
17 is a long, slow journey that never ends, and there are  
18 many side roads that can easily mislead the unaware.

19 Finally, culture is unique to an organization.  
20 A culture cannot be transplanted from one organization  
21 to another. The Navy's culture is not the same as the  
22 National Aeronautic and Space Administration's or the  
23 Department of Energy's culture. The organizations and  
24 missions are very different, and consequently the  
25 cultures that develop to satisfy those missions are also

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1 very different.

2           Hopefully one can identify those attributes of a  
3 culture that makes it safer and embed those attributes  
4 into other cultures. Those basic attributes may apply  
5 across all organizations, but the devil is in the  
6 details, and those details may vary widely.

7           Our goal for the first two meetings in this  
8 series has been to learn about how different  
9 organizations create, sustain and implement the robust  
10 culture of safety.

11           Our goal for the next meeting in this series is  
12 to discuss with the Department of Energy how this  
13 understanding may be applied to its organization and  
14 activities as we continue in our joint journey to  
15 improve and sustain the safety of the Department of  
16 Energy's Defense Nuclear Facilities.

17           I look forward to those discussions, and I hope  
18 that all of you will join us then. Once again, I want  
19 to thank everyone for their participation at this  
20 hearing.

21           The record of this proceeding will remain open  
22 until September 27, 2014. I would like to reiterate  
23 that the Board reserves its right to further schedule  
24 and regulate the course of this public meeting and  
25 hearing to recess, reconvene, postpone or adjourn this

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1 public meeting or hearing and to otherwise exercise its  
2 authority under the Atomic Energy Act of 1954 as  
3 amended.

4 This concludes the public meeting and hearing of  
5 the Defense Nuclear Facilities Safety Board. We're now  
6 adjourned. Thank you all for attending.

7 (Whereupon, at 5:08 p.m., the hearing was  
8 concluded.)

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