

UNITED STATES DEPARTMENT OF TRANSPORTATION  
 PIPELINE AND HAZARDOUS MATERIALS  
 SAFETY ADMINISTRATION

+ + + + +

VOLUNTARY INFORMATION-SHARING SYSTEM  
 WORKING GROUP

+ + + + +

OPEN MEETING

+ + + + +

WEDNESDAY  
 JUNE 20, 2018

+ + + + +

The Voluntary Information-Sharing System Working Group met in the Federal Highway Administration Research Center, 6300 Georgetown Pike, McLean, Virginia, at 8:30 a.m., Dr. Christie Murray, Designated Federal Official, presiding.

PRESENT

DIANE BURMAN, Chair  
 ALAN MAYBERRY, PHMSA Representative  
 ERIC AMUNDSEN, Member  
 MICHAEL BELLAMY, Member  
 KATE BLYSTONE, Member  
 ROBERT BUCHANAN, Member  
 DAN COTE, Member  
 JASON CRADIT, Member  
 BILL CROCHET, Member  
 YIMING DENG, Ph.D., Member  
 MARK HERETH, Member  
 LEIF JENSEN, Member  
 WALTER JONES, Member

MIKE LaMONT, Member  
JOHN MacNEILL, Member  
RANDY PARKER, Member  
HOLLY PEAREN, Member\*  
JOE SUBSITS, Member  
MICHELLE THEBERT, Member  
CHRISTOPHER WARNER, Member

ALSO PRESENT

CHRISTIE MURRAY, Ph.D., Designated Federal  
Official  
AHUVA BATTAMS, Attorney Advisor, PHMSA  
SHERRY BORENER, Ph.D., PHMSA  
JOHN DeLEEuw, American Airlines  
MICHELLE FREEMAN, PHMSA  
DREW HEVLE, Kinder Morgan  
KAREN LYNCH, PHMSA  
HUNG NGUYEN, PHMSA  
PAUL ROBERTI, ESQ., General Counsel, PHMSA  
NADIAH RODRIGUEZ, PHMSA  
JOHN STOODY, Association of Pipe Lines  
VICKIE TOMAN, SMS Manager, American Airlines  
PETE VEENSTRA, TRC Solutions  
CHERYL WHETSEL, PHMSA  
DOUGLAS WHITE, Ed.D., PHMSA  
NANCY WHITE, PHMSA

CONTENTS

Welcome and Safety Brief . . . . .	4
Committee and Staff Introductions. . . . .	6
Call to Order/Open Statement . . . . .	.11
Opening Remarks. . . . .	.12
Committee Business	
Subcommittee Report Outs . . . . .	.25
Aviation Information Sharing and SMS . . . . .	231
API 1163, In-line Inspection Systems . . . . .	352
Discussion on IT Architecture. . . . .	402
Committee Preparatory Discussion	
Action Item Recap and Closing Remarks. . . . .	464
Adjourn. . . . .	474

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

2 8:32 a.m.

3 DR. MURRAY: Good morning and welcome  
4 to everyone. I'm not sure if anybody is joining  
5 by phone, but if there's anyone on the phone  
6 line, if you could say good morning. Okay, we'll  
7 just leave the line open for now, but welcome,  
8 and thank you for joining us for our Voluntary  
9 Information Sharing System Working Group Federal  
10 Advisory Committee meeting.

11 My name is Christie Murray, and I will  
12 be presiding as the designated federal official  
13 for the meeting today. The purpose of our  
14 Federal Advisory Committee meeting for voluntary  
15 information sharing is to fulfill Section 10 of  
16 the Pipes Act of 2016.

17 The overall objective is to consider  
18 the development of a voluntary information  
19 sharing system to encourage collaboration that  
20 improves pipeline safety across the industry --  
21 and I'm paraphrasing -- and ultimately, the goal  
22 is to provide recommendations to the secretary of

1 transportation. The main deliverable of the VIS  
2 working group is to submit a recommendation  
3 report to the secretary of transportation that  
4 addresses these items listed here on the screen.  
5 I don't necessarily want to read through each one  
6 of them, but they will be provided in the meeting  
7 documentation.

8 The goal of this Advisory Committee is  
9 to develop and finalize the recommendation report  
10 by the end of this year, December 2018. Just a  
11 few housekeeping items. One, the restrooms are  
12 immediately out the door, the exit to my right.  
13 Make a right past the security desk, and you'll  
14 find the restrooms down the hall, on the  
15 right-hand side.

16 If you have not done so already,  
17 please silence your mobile devices. Also, thank  
18 you, those members of the public that have joined  
19 us today. We appreciate you being here with us.  
20 There will be opportunities for the public to  
21 participate in the Advisory Committee meeting  
22 today.

1           We would ask that you would hold your  
2           comments until we actually open the floor for  
3           them and try to keep your remarks brief, up to  
4           five minutes, so that we can hear from multiple  
5           individuals, if needed. Also, you can submit  
6           written comments to the docket, PHMSA, P-H-M-S-A,  
7           dash 2016-0128. In case of an emergency and we  
8           need to evacuate the building, if you leave out  
9           of the exits immediately to my right, make a  
10          right immediately and go out those main entrance  
11          doors that we just came in, it's right in front  
12          of the security desk.

13                 We will go all the way to the back.  
14          Follow the path right through the trees straight  
15          ahead, and we will meet right at that area before  
16          you hit the parking lot. That will be our  
17          rallying point. Next, I will turn it over to the  
18          chair.

19                 CHAIR BURMAN: Thank you. I'm going  
20          to go around, have everyone say their name, their  
21          title, and their company and their  
22          representative, so that we can establish a

1 quorum. Why don't we start at the end?

2 MR. CROCHET: I'm Bill Crochet. I'm  
3 the senior director of asset integrity for Plains  
4 All American Pipeline, representing the industry.

5 DR. WHITE: Good morning. I'm Doug  
6 White. I'm the director of PHMSA training and  
7 qualifications, and I serve as the ADFO for the  
8 Training and Qualification Subcommittee.

9 MS. WHITE: Good morning. I'm Nancy  
10 White. I'm the director of policy and programs  
11 for the Office of Pipeline Safety in PHMSA, and  
12 I'm the ADFO for the Missions, Objectives, and  
13 Governance Committee.

14 MS. LYNCH: Good morning. My name is  
15 Karen Lynch. I work in PHMSA's Office of  
16 Pipeline Safety and serve as the ADFO for the  
17 Reporting Subcommittee.

18 MS. FREEMAN: Good morning, Michelle  
19 Freeman. I'm the deputy director of budget and  
20 finance with PHMSA. I'm the ADFO for the  
21 Regulatory, Legal and Funding Subcommittee.

22 DR. DENG: Good morning. Yiming Deng,

1 associate professor at Michigan State University,  
2 representing a research institution.

3 DR. BORENER: Good morning. I'm  
4 Sherry Borener. I'm the chief data officer in  
5 the Office of Planning and Analytics at PHMSA,  
6 and I'm the ADFO for the Process Sharing  
7 Subcommittee.

8 MR. COTE: Good morning. My name is  
9 Dan Cote. I am a consultant to the gas industry  
10 for pipeline safety and compliance. I was with  
11 NiSource 45 years, until the end of November of  
12 last year, where I was their vice president of  
13 pipeline safety and compliance, and I'm here  
14 representing NiSource and the gas distribution  
15 industry. In addition, I chair Commissions and  
16 Governance Subcommittee.

17 MS. BLYSTONE: My name's Kate  
18 Blystone. I'm outreach manager for the Pipeline  
19 Safety Trust, and I'm here representing pipeline  
20 safety advocacy groups.

21 MR. HERETH: I'm Mark Hereth. I'm the  
22 managing director of the Blacksmith Group. I'm



1 also the chairman of the INGAA Foundation. I'm  
2 serving as the chairman of the subcommittee on  
3 process sharing, and I represent the pipeline  
4 industry.

5 MR. SUBSITS: Joe Subsits. I work  
6 with the Washington Utilities and Transportation  
7 Commission, and I'm here representing state  
8 regulators.

9 MR. PARKER: I'm Randy Parker. I'm  
10 vice president of regulatory affairs at Kinder  
11 Morgan. I represent the industry. I'm also the  
12 chair of Regulatory Funding and Legal  
13 Subcommittee.

14 DR. MURRAY: Good morning. I'm  
15 Christie Murray, and I'm with PHMSA. I serve as  
16 the designated federal official for the advisory  
17 committee.

18 CHAIR BURMAN: Good morning. I'm  
19 Diane Burman, New York State Public Service  
20 Commission, representing state regulators.

21 MS. BATTAMS: I'm Ahuva Battams. I'm  
22 an attorney advisor with the Office of Pipeline

1 Safety, PHMSA, and I'm here to assist should you  
2 have legal questions.

3 MR. WARNER: Chris Warner, senior vice  
4 president for Mears and, today, serving as the  
5 chairman for the Technology R&D Subcommittee.

6 MR. JONES: I'm Walter Jones. I'm  
7 director of occupational health and safety for  
8 the Laborers Training Fund, and I'm representing  
9 labor.

10 MR. LAMONT: Good morning, Mike  
11 LaMont, director of integrity services, TRC  
12 Solutions. I'm here representing industry.

13 MR. BUCHANAN: I'm Bob Buchanan with  
14 Seal for Life Industries. I represent coating --

15 MR. AMUNDSEN: Good morning, Eric  
16 Amundsen, senior vice president, operations, for  
17 Energy Transfer Partners, representing industry,  
18 and also the chairman of the Best Practices  
19 Subcommittee.

20 MR. MACNEILL: I'm John MacNeill. I'm  
21 the national safety director for the Utility  
22 Workers Union of America, and I'm representing

1 labor.

2 MR. JENSEN: Good morning, Leif  
3 Jensen, Sunoco Pipeline, a division of Energy  
4 Transfer. I'm a senior director of technical  
5 operations and also serving as chair of what's  
6 currently known as the Training and  
7 Qualifications Subcommittee.

8 MR. BELLAMY: Good morning. I'm  
9 Michael Bellamy, with Baker Hughes, GE, and I  
10 represent the line inspection community.

11 MS. THEBERT: I'm Michelle Thebert,  
12 the director of pipeline safety and facility  
13 protection at the Georgia Public Service  
14 Commission.

15 CHAIR BURMAN: Is there anyone on the  
16 phone? Hearing none, there is an established  
17 quorum, and I call this meeting of the Voluntary  
18 Information Sharing System Working Group  
19 Committee to order. The meeting is being  
20 recorded, and a transcript will be produced for  
21 the record. The transcript and the presentations  
22 will be available on the PHMSA website and on the

1 eGov docket at [www.regulations.gov](http://www.regulations.gov), and the  
2 docket number for this meeting is  
3 PHMSA-2016-0136.

4 I'd just like to remind folks to  
5 introduce yourselves each time you speak, so your  
6 comments can be acknowledged in the meeting  
7 transcript. You can set your tent card on its  
8 side if you care to make a comment. I will note  
9 that some of you are very low speakers. Because  
10 we don't have microphones available, we're going  
11 to have to project our voices.

12 Just warning you that I may ask you to  
13 speak up, and people shouldn't be shy if we can't  
14 hear. It won't be considered rude at this point.  
15 I just want to let you know. Right now, we're  
16 going to go over the agenda. I turn it back over  
17 to Dr. Murray.

18 DR. MURRAY: Since Alan is not here,  
19 and Drew has not joined -- I think he may still  
20 be ill -- what we'll do is we'll talk about --  
21 we'll share a few announcements here this  
22 morning, and then we'll move right into the

1 Committee business, and we will focus on the  
2 subcommittee report out discussions, starting  
3 with Mission and Objectives.

4 Then we will have those conversations  
5 through lunch, or up until lunch, at noon, and  
6 we'll break for about an hour and a half for  
7 lunch, since this facility doesn't really have  
8 any dining facilities. We'll talk about lunch  
9 options on the next slide, but I want to allot  
10 more time for those who need to go out and get  
11 lunch and come back.

12 Also, this afternoon, we have several  
13 different great discussions coming up. One, we  
14 have John DeLeeuw will be joining us with the  
15 Aviation Information Sharing to talk about SMS,  
16 as well, so I'm looking forward to that  
17 discussion. If you remember at our last meeting,  
18 in April, he joined us by phone, in the morning,  
19 just to introduce himself and to talk a little  
20 bit about his American Airlines experience and  
21 his experience working with SMS, so he'll be  
22 joining us in person to share more today. Also,

1 we will have Drew Hevle coming in to talk about  
2 the APIRP 1163 In-Line Inspection standard. I  
3 know there were some discussions about it in the  
4 subcommittee meeting, so we're looking forward to  
5 that.

6 Then we'll turn it over to the -- I  
7 think it's the Technology Committee, Chris, to a  
8 little bit more about IT architecture for the  
9 broader parent committee. Then we'll move into a  
10 committee participatory discussion to talk about  
11 prepping for the next meeting and any other  
12 logistical items that need to be covered.

13 So start thinking, as you're sitting  
14 here listening today. If you have ideas for the  
15 next meeting, which is coming up in August, for  
16 speakers, if those are of interest and there's  
17 things that stick out to you as you're listening,  
18 bring those back forward this afternoon, so that  
19 we can talk about them.

20 Then we'll share any action items from  
21 today's meeting and have closing remarks. Any  
22 questions about today's agenda? Okay, great.

1 For those who weren't here yesterday for the  
2 subcommittees, there's really three options for  
3 lunch. If you haven't -- some of you may have  
4 brought your lunch, if you knew to bring your  
5 lunch and wanted to take advantage of that  
6 option, but also, you can stay in the building  
7 and order in. I'm bringing up these numbers.

8 There's also a restaurant list on the  
9 table in the far corner, to my right. If you're  
10 interested in just ordering in on a break and  
11 having it set up for lunch, you can have that  
12 brought in, or if you want to car pool and join  
13 some of your colleagues for lunch, that's an  
14 option, as well.

15 We'll resume our meeting at 1:30 this  
16 afternoon. Just some general announcements. For  
17 those who may not be aware, if you're looking for  
18 documents from any of the VIS Advisory Committee  
19 meetings, they are located on our PHMSA meeting  
20 registration pages.

21 So for each meeting, whether it was  
22 this meeting, you'll see it posted, previous

1 meeting in April, February, November, and  
2 backward. Each meeting has its own registration  
3 link. If you click those links, it will have all  
4 the documents, the transcripts, Federal Register  
5 notice, agenda for the previous meetings, if  
6 you're looking for that information. Also, you  
7 can visit the VIS Working Group PHMSA web page  
8 for more information about the Committee. As  
9 we're sitting here now, August is right upon us,  
10 if you really think about it. It's already June.

11 That's when we're having our next  
12 meeting, on August 22nd and 23rd, so please save  
13 the dates. On the 22nd will be subcommittee  
14 meetings, which are closed to the public, and on  
15 the 23rd of August we will have our normal VIS  
16 Advisory Committee meeting, which will be open to  
17 the public.

18 We do have a location, so we won't run  
19 into the issues we've with trying to find meeting  
20 space. We will be meeting, actually, for the  
21 rest of our meetings this year at our DOT  
22 headquarter facility in Washington, D.C. The



1 address is listed here.

2           It looks like that's pretty popular.  
3 I know there are some cheers for that, so good to  
4 hear. I know Mark's looking forward to the  
5 trapezoid, the old school with the trampolines  
6 and that sort of thing. If we see him drifting  
7 off, we may have to go retrieve him. He'll be  
8 somewhere in the air. The registration page for  
9 the next meeting, in August, is also available.  
10 The link is shared here at the bottom of the  
11 presentation. Just a snapshot of the meetings we  
12 have left for the remainder of the year, August,  
13 which I've mentioned.

14           We'll be getting back together in  
15 October, on the 16th and 17th, and then  
16 hopefully, in December, with celebrations,  
17 finalization of the report. I'm just looking in  
18 my crystal ball. I'm not being presumptuous, but  
19 I'm dreaming.

20           I think we're in pretty good shape,  
21 and we're on track to meet that timeline, so I  
22 appreciate everyone's efforts and encourage the

1 Committee and the subcommittees to continue the  
2 great work that you're doing. As I mentioned,  
3 all of the meetings will be at our DOT building.

4 Next up, I want to tee up the  
5 conversation regarding the subcommittees. I know  
6 we're going to move in to subcommittee report  
7 outs, but for those who aren't members of the  
8 subcommittees, I want to make sure that we  
9 provide a little context over what we're doing  
10 with the seven subcommittees, so just bear with  
11 me here briefly. I put this together to describe  
12 what is going on with how we're operating with  
13 the structure. Ultimately, we're issuing reports  
14 to the secretary of transportation,  
15 recommendations to the secretary. On the left  
16 side, in blue, you have the Advisory Committee,  
17 which is the group sitting around the U here this  
18 morning, the members of the Advisory Committee,  
19 and the PHMSA staff -- raise your hand if you are  
20 part of the PHMSA staff supporting this Advisory  
21 Committee. Great.

22 You see who we are. We really support

1 the parent committee. As the parent committee  
2 organized and thought about the aggressive  
3 schedule and the substantive work that needed to  
4 take place over this year, it made sense to  
5 organize into subcommittees.

6 What you'll see is for the Advisory  
7 Committee members on the left, where there's 25  
8 members, you'll see a corresponding group of  
9 subcommittees, which there are seven, who support  
10 the parent committee. The subcommittees are not  
11 able to make direct recommendations to the  
12 secretary of transportation. It has to go  
13 through -- they only work through the parent  
14 committee, so their recommendations will go to  
15 the parent committee for their consideration and  
16 deliberation. With that, PHMSA staff also  
17 supports a subcommittee. Each subcommittee has  
18 an alternate designated federal official, who  
19 supports each subcommittee and has to be present  
20 when subcommittees meet.

21 To underpin all of those efforts, that  
22 are contract support staff. You have a court

1 reporter who helps with the transcription of our  
2 meetings, and also, we have, now -- we've  
3 recently introduced technical writers to help the  
4 subcommittees with drafting any documentation  
5 and, more specifically, the recommendations that  
6 will be included in the report.

7 This is just a quick snapshot of who  
8 the ADFOs are from PHMSA staff and who, from the  
9 parent committee -- those individuals who were  
10 chairing the subcommittees, just as a point of  
11 reference.

12 Note that Alan Mayberry, myself and  
13 Diane and one of our chief counsel members, we  
14 really float between the subcommittees to provide  
15 guidance and support, as needed. Not going to  
16 get into the minutiae of who's on each  
17 subcommittee. It's provided in the presentation  
18 that will be posted for your reference, and it's  
19 too small to read, even for me. I just wanted to  
20 make sure that list of who's participating was  
21 available to the public. How the subcommittee  
22 will function. There's inputs that will go into

1 the overall report.

2           You have your parent committee input.  
3 There's a draft outline or guiding report  
4 sections that help to guide how the  
5 recommendations will likely come together. Then  
6 you have input from the subcommittees.

7           The subcommittees were given -- or  
8 they actually have developed, but they have  
9 approved task statements, which really guides the  
10 work of the subcommittees. Without the task  
11 being described in these task statements, they're  
12 unable to take on new work without it being  
13 approved by the parent committee.

14           Subcommittees are working. They will  
15 be bringing recommendations back to this parent  
16 committee, some of which you may hear today, and  
17 those recommendations will need to be voted on  
18 and approved before they can actually become  
19 drafted parts of the actual report. Just as a  
20 snapshot, there is a framework for the  
21 recommendation report that is being considered.  
22 Here, you will notice that there is a normal

1 table of contents, front matter, with an  
2 executive summary, key terms, etc., introduction  
3 and background. The key essence of the report  
4 will be the recommendations section.

5 You'll notice alignment with the seven  
6 subcommittees that were formed and alignment with  
7 the key areas that will be focused on in the  
8 recommendation report and, of course, the  
9 conclusion and the appendices for reference  
10 material.

11 This is just a snapshot of the  
12 timeline. I think the parent committee and  
13 subcommittee approach is working well for this  
14 body. There's progress that's been made since  
15 the beginning of the year and a lot of good work  
16 that's currently taking place.

17 Right now, the Committee and  
18 subcommittee is in full mode to flesh out  
19 recommendations, seek out input from subject  
20 matter experts and guests with relevant  
21 information to share, and really working to start  
22 to formulate some of the key aspects of the

1 report, itself. The goal is to have an initial  
2 recommendation report developed by  
3 August/September time frame of this year. Then  
4 at that point, it will go through several  
5 iterations of review by this parent committee for  
6 comment and input. As I mentioned, the overall  
7 goal is to have the report submitted to PHMSA by  
8 the end of this year, in December.

9           Since we've established subcommittees  
10 -- they kicked off back in February of this year.  
11 Subcommittees had its first face-to-face meeting  
12 in the February 29th meeting, and then  
13 subcommittees have met face-to-face twice since  
14 then, in April and just yesterday, in June.

15           There have been a number of guest  
16 speakers invited into subcommittee meetings, both  
17 the phone conference meetings, and also the  
18 face-to-face meetings, some of which we've had  
19 some really robust conversations.

20           I know FAA came yesterday and spoke  
21 about funding with the aviation information  
22 sharing efforts, and it was quite informative, I

1 think, for all the subcommittees to hear from  
2 FAA. Also, I know that some of the subcommittees  
3 are beginning to draft sections of the report and  
4 provide some input. Some things you may hear  
5 come up in the report outs today may require  
6 parent committee input and voting, so be  
7 objective and keep an open mind as the  
8 subcommittees report out today. I mentioned the  
9 tech writers are assigned to assist, and we're  
10 going to continue next with the report outs from  
11 the subcommittees.

12 With that being said, I will turn it  
13 over to Dan Cote, who will kick us off with the  
14 subcommittee report outs with mission and  
15 objective. You guys could pass this around for  
16 me. That would be great. While we're doing  
17 that, are there any questions about the  
18 subcommittee overview that I just provided, how  
19 that will work?

20 CHAIR BURMAN: The only thing that I'd  
21 like to say is I think it's really critical now  
22 that we have focus on the first reporting that



1 we're going to be doing for August. We really  
2 are at a critical juncture.

3 To the extent that we also are  
4 engaging with the tech writers, I think that's  
5 very important and that we make sure that they  
6 are going to continue with us, as well, and that  
7 it's a seamless process, so that we don't lose --  
8 they don't change who they are, so just making  
9 sure that we establish that is very important to  
10 the Committee.

11 DR. MURRAY: Thank you.

12 MR. COTE: Interesting you should say  
13 that, Madam Chairman, because I was going to  
14 cover both points on behalf of missions and  
15 objectives. When I say both points, we are not  
16 going to ask for any sort of vote today from  
17 mission and objectives.

18 We're on a trajectory to do that in  
19 August and feel like we can do it comfortably.  
20 Do want to use this time to really solicit input  
21 from the Committee on a couple of key points that  
22 we're dealing with that will provide

1 directionality going forward to us.

2 I guess the second issue that supports  
3 that is following this meeting, those technical  
4 writers are going to become very, very critical  
5 to this team, particularly because we will have  
6 all of our base information. It will really be a  
7 matter of sitting down and really creating our  
8 final document. That support over the next 60  
9 days is simply going to be critical to us.  
10 Appreciate that observation.

11 DR. MURRAY: I'm going to make one  
12 point about the tech writers. Please keep in  
13 mind that the tech writers are certainly here as  
14 a resource. If they ask questions because they  
15 don't understand, there's a great chance that  
16 whoever's the product of the report may not  
17 understand it.

18 They will serve as a great resource  
19 and sounding board to make sure that your  
20 recommendations are clear, concise, and they make  
21 sense, and they're written in plain English for  
22 others to be able to digest.

1           MR. COTE: I would only add to all of  
2           that, the one that missions and objectives has  
3           been working with has been simply outstanding and  
4           was very, very good at fleshing out those issues  
5           that were not clear. They were very clear to us,  
6           and not clear to anyone else. All of that is  
7           incredibly helpful.

8           That's a fine group of professionals,  
9           and we are very grateful for the support. Having  
10          said all of that, here is our subcommittee  
11          makeup. Obviously, we are excellently supported  
12          by Nancy White as the alternate designated  
13          federal official. Our team, I won't read the  
14          names, but very robust group, excellent  
15          participation. Want to thank the entire team.  
16          Over the last, particularly, several meetings,  
17          we've raised any number of issues, hammered a lot  
18          of them out.

19          There are still one or two, again,  
20          that we want to test with the full Committee to  
21          make sure our strategic vision of this is  
22          correct. Certainly grateful to the Committee.

1 Please, all of you, Walter, Leif, Bob, Randy, I'm  
2 not sure if Holly's on the phone, Joe, feel free  
3 to weigh in as we have this discussion.

4 Just a little bit of history.

5 Obviously, we started out as the missions team.  
6 We completed our initial work in February, moved  
7 that to finality in April. We're in pretty good  
8 shape. Our reward for that contribution was it  
9 was decided that we should also handle objectives  
10 and organization. Here we are.

11 It's been an interesting discussion.

12 Before we get into a lot of the specifics, I  
13 would say that we've been dovetailing pretty well  
14 with Randy's group and the legal group. The way  
15 we envisioned it, the legal group outlines the  
16 strategic vision for the way the legislation  
17 works, the areas that require legislation, and  
18 the overall, very high-level organization stream.  
19 Our job was really to take those strategic  
20 concepts that we pretty fully agree with and  
21 operationalize them, in terms of what does that  
22 mean, in terms of what a VIS organization looks

1 like?

2           Ninety percent of that translation, in  
3 my mind, is in pretty good shape. We are pretty  
4 well aligned. I think 10 percent of it, at a  
5 very high level strategic level, will need a  
6 little bit of debate and a little clarification  
7 from all of you in a minute.

8           That is really the key purpose that I  
9 am looking to achieve in this morning's  
10 discussion. With that said, again -- this is  
11 nothing more than more of that background, in  
12 terms of our getting our initial mission  
13 statement approved and moving on to the  
14 organizational model and governance.

15           Just a number of recommendations.  
16 These are just to give you a flavor of it. We're  
17 really not going to work this today, but wanted  
18 you all to have a sense of the work we've done.  
19 In terms of structure, any VIS system should have  
20 a formal governance structure, including an  
21 executive director, executive board, so on. That  
22 is the tenor and level of detail that we're

1 producing. All of these bullets are consistent  
2 with that central philosophy that I reviewed.

3 There is one key point, though, that  
4 we want to explore again. That's the strategic  
5 purpose of this morning's presentation. We  
6 really want to answer and discuss two strategic  
7 questions. To outline the strategic questions,  
8 let's start with a fundamental premise that the  
9 governance group has, at least.

10 That is the absolute key to VIS is  
11 industry participation in risk identification,  
12 risk remediation, and strategic risk avoidance  
13 going forward. To do that, we need robust  
14 industry participation, providing data on  
15 findings, near misses, strategies around  
16 remediation, and particularly strategies around  
17 future risk avoidance.

18 The best incidents are the ones that  
19 we never know about and never have because we  
20 simply avoided them as a strategic purpose and  
21 outcome. The key to all of that is getting  
22 enough critical mass from pipeline liquid,

1 pipeline gas, and distribution company operators.  
2 Without that, all of this becomes an academic  
3 exercise. I'm going to pause there for a minute.  
4 That's a very fundamental strategic conclusion.  
5 Does anyone disagree with that? Please, Chris.

6 MR. WARNER: Chris Warner, from Mears.  
7 I don't disagree with that. The question I would  
8 have is -- one of the things we've been wrestling  
9 with is does that mission statement expand to  
10 also looking at how effective technologies are at  
11 finding those threats and identifying the need  
12 for new technologies, or at least making the  
13 industry aware of what technologies are most  
14 effective at identifying threats. I didn't hear  
15 that in your description of the purpose of the  
16 VIS.

17 MR. COTE: No, but that is a critical  
18 one because, again, I address that strategically  
19 in that final bullet that talks about risk  
20 avoidance. I can easily see VIS processing data  
21 that flows through the system, in terms of,  
22 again, identify a risk, near misses, and even

1 incident data that concludes that -- as we see  
2 today, everyone can be doing the right things  
3 under 192 and we still have incidents. The  
4 question is how do we reach a point of genuine  
5 risk avoidance? Because our proactive analysis  
6 of our systems are so robust that we're actually  
7 preventing them without even having to deal with  
8 them. That's what you're really talking about.  
9 The short answer is yes.

10 MR. HERETH: Dan, I don't disagree  
11 with your emphasis on risk and risk mitigation,  
12 but I think it's the information sharing which  
13 has the emphasis of which identification of risk  
14 and risk mitigation can be an outcome. It's a  
15 subtle -- because I think when you look at the  
16 title of our work, it's voluntary information  
17 sharing. It's not risk reduction. It's  
18 voluntary information sharing for the purposes of  
19 improving pipeline safety.

20 MR. COTE: Intrinsic in my remarks is  
21 in doing those things, risk reduction will be a  
22 result. Would you disagree with that?



1                   MR. HERETH: I think it can be, yes.  
2 I think there's a difference in leading with  
3 risk, as opposed to leading with information  
4 sharing. I think our mission is information  
5 sharing, of which an outcome can be risk  
6 reduction, risk identification and risk  
7 reduction.

8                   MR. COTE: I understand.

9                   MR. HERETH: It's subtle, but I think  
10 it's important. Others may disagree. I don't  
11 disagree with your statement. I sort of, at a  
12 strategy level, tend to think of what that end  
13 game looks like, in terms of -- maybe risk  
14 reduction is a poor choice of terms. I think  
15 it's good.

16                   MR. COTE: Increased pipeline safety  
17 may be a better way to put it. Is that fair?

18                   MR. HERETH: Yes, thank you.

19                   MR. COTE: I appreciate that. Other  
20 thoughts and comments before we move on?

21                   CHAIR BURMAN: I would just point out  
22 that the mission statement talks about,

1 initially, the voluntary information sharing, the  
2 need for gathering that information for risk  
3 assessment, and then using that in a  
4 collaborative way to lead to actionable outcomes.

5 I think that incorporates a lot of  
6 this conversation in a way that I think makes  
7 sense, and also doesn't put the cart before the  
8 horse. So it gets to the voluntariness of it,  
9 the information sharing, the risk assessment  
10 that's done with that, and then leading to  
11 actionable outcomes.

12 MR. COTE: That, we trust, will  
13 ultimately improve pipeline safety.

14 CHAIR BURMAN: Right, and improving  
15 pipeline safety is in the mission statement, as  
16 well.

17 MR. COTE: Alan, did you have a  
18 comment?

19 MR. MAYBERRY: Yes, I  
20 compartmentalized the different building blocks  
21 there. The ultimate goal, improving pipeline  
22 safety, what leads to that is risk reduction, and

1 then what leads to risk reduction is data  
2 sharing, to your approach there. I did have a  
3 couple of questions on this.

4 MR. COTE: That's our next stop.  
5 Wanted to create that overall understanding of  
6 purpose. Here was the debate. It became a very  
7 significant strategic question. Because we need  
8 people to volunteer to participate, we saw three  
9 critical tools that, again, in working with the  
10 legal group, that were intrinsic to creating an  
11 environment where people would want to share  
12 data. Those three are obviously confidentiality,  
13 a non-punitive system, where the things that you  
14 report to VIS are not used in any sort of  
15 punitive or enforcement action, and finally,  
16 obviously, PHMSA or federal funding for at least  
17 the initial development of the program.

18 The question that I'd like to put  
19 before the Committee is in everyone's mind, as  
20 they think about our industry, is that enough to  
21 overcome the traditional industry reluctance to  
22 share data on things like -- detailed data on

1 near misses and findings, whether that's ILI or  
2 simple leak investigation findings?

3 Is that enough incentive for the  
4 industry to really want to join? There was a bit  
5 of a debate on our committee and a sort of sense  
6 that there is -- I don't want to use the word  
7 distrust. It's probably too strong. But there  
8 is not a strong bond of trust today, necessarily,  
9 between state and federal regulators and many in  
10 the industry.

11 It's not that there's necessarily  
12 distrust, but what I will call an absence of  
13 trust, which could be an impediment to people  
14 being willing to share information. The simple  
15 question at the heart of the discussion is if we  
16 offer those three mechanisms, along with that  
17 sense that as you identify risks and create  
18 remediation plans or create proactive preventive  
19 plans on the things that you find in your system  
20 and report them through VIS and share that  
21 information, what you found and what you're doing  
22 -- again, the heart of VIS -- and there's no

1 enforcement action, your data's absolutely  
2 confidential, but ultimately gets aggregated and  
3 shared with the industry, and where PHMSA is  
4 essentially funding the cost of that program, as  
5 opposed to making that an industry only  
6 standalone program, all of which, in our minds,  
7 there are advantages to, in other words, PHMSA  
8 involvement and the funding and the  
9 organizational structure, at the same time, is  
10 that enough to get operators to play? I would be  
11 interested in thoughts, comments, and feedback on  
12 that. Joe.

13 MR. SUBSITS: I think what you've  
14 listed there are the friction points you overcome  
15 initially, but as the program matures and  
16 progresses, people like to see, I think, the  
17 fruits of their labor materialize into something  
18 which is going to be effective. I think,  
19 ultimately, the system needs to be effective  
20 enough to bring back learning which people can  
21 benefit from. If people do work and they're not  
22 getting any benefits from it, they're going to

1 stop doing it. Once the momentum of the program  
2 is established, people need to see the fruits of  
3 their labor come to fruition.

4 MR. COTE: The key to that is getting  
5 an initial critical mass to produce enough flow  
6 of data to provide that. You're right. If, a  
7 couple of years after initial implementation,  
8 there's enough data to say we've got these ten  
9 findings; this information is great and we can  
10 act on it, I agree with you. But one of the -- I  
11 don't remember who, precisely, it was.

12 I think it was one of the associations  
13 of operators who put together a system in the  
14 past five years that had ten reports, clearly not  
15 enough critical mass that we heard about  
16 yesterday. It's essentially an academic  
17 exercise, a moot point, because there's not  
18 enough mass to produce the data that they need to  
19 make those improvements, so it's, again,  
20 essentially sterile. That becomes the heart of  
21 the challenge.

22 CHAIR BURMAN: We'll go to Kate, and

1 then Mark, but if I just could remind you to  
2 state your full name and where you're from for  
3 the transcript.

4 MS. BLYSTONE: Kate Blystone, Pipeline  
5 Safety Trust. I think the other critical factor  
6 in that example you used with the Railroad  
7 Commission is a major player was part of it, and  
8 then left. I think that's another key factor is  
9 bigger organizations, like Energy Transfer  
10 Partners and Kinder Morgan, for example, need to  
11 play as long as physically possible because  
12 that's going to lend credibility to the whole  
13 process.

14 MR. COTE: No disagreement. I would  
15 make the same argument on behalf of the LDC, same  
16 if the large players don't engage. Mark.

17 MS. BLYSTONE: I need to speak louder?

18 MR. COTE: Mark.

19 CHAIR BURMAN: We can give you the mic  
20 if we need to. I think that's better. Thanks.

21 MR. HERETH: I appreciate this, Dan.  
22 Thank you very much. I really like Joe's

1 characterization of these as friction points.  
2 That's a really great way to describe it. I  
3 think that's a great starting point. I think  
4 there's a couple of others, possibly, one of  
5 which is that if you go back to -- Michael, maybe  
6 this sets you up -- to why GE was really helping  
7 to drive this in the legislative process was to  
8 try to find ways to advance technology more  
9 rapidly than might otherwise occur.

10 I'll leave that to you to expand.

11 That's my sense, and I think that's the  
12 opportunity, one. Then I think the other is that  
13 we have to overcome -- how do I say this --

14 MR. HERETH: I think that's a part of  
15 this, as well.

16 MR. COTE: No disagreement with you.  
17 Absolutely couldn't agree more, particularly the  
18 inertia part, where our industry, this is very  
19 new, at least structurally, in our industry, so a  
20 lot of people, to your point, will tend to hang  
21 back and watch what happens.

22 MR. HERETH: The other part of that



1 that I wanted to state was that I think that  
2 generally, operators would agree that if there is  
3 a failure, it's not just that operator who  
4 suffers. It's all operators who suffer, in that  
5 regard. So the extent that we can eliminate and  
6 prevent incidents, then that benefits everyone.

7 MR. COTE: You bet.

8 MR. HERETH: I think that's part of  
9 the incentive for operators to be in this is to  
10 ensure that they find ways -- we had some  
11 discussion in our subcommittees yesterday about  
12 learning from others and the importance of that,  
13 so it prevents you from having that same  
14 incident.

15 MR. COTE: You bet. Couldn't agree  
16 more, thank you. Alan.

17 MR. MAYBERRY: I just want to say  
18 we're really shifting the paradigm. Let's be  
19 clear that we have, and will always have, the  
20 traditional approach for oversight and the  
21 relationship that goes with that.

22 Realizing that -- obviously, we

1 publish the regulation, the federal minimum  
2 standard. We inspect against that standard.  
3 There's an information exchange that happens in  
4 that process. One of the friction points that  
5 Joe points out is the concern over just overly  
6 sharing. We're only answering the question  
7 that's asked. I knew that as an operator. I  
8 know that as a regulator, to ask the right  
9 questions. That's going to continue and evolve.  
10 This is okay, we do that, we have a very robust  
11 program, but accidents still happen.

12 Pigs are on the line, we still need to  
13 improve the technology. What is another domain  
14 to work within? That's where SMS comes into  
15 play, and in particular, sharing of information  
16 because the other friction point is the ability  
17 -- the concern over intellectual property and the  
18 ability to really share the way it needs to be  
19 shared, so people understand the capabilities of  
20 the technology and what they need to watch out  
21 for.

22 We really need to break away from that

1 traditional paradigm that will always be there to  
2 what will make this work? How do we remove the  
3 barriers to make this work? That's where I see  
4 -- okay, we're going to be an enabler. The  
5 federal government will be an enabler, but we  
6 wouldn't necessarily own it. I think that option  
7 is still open. I wouldn't say we own it or that  
8 we don't own it. I just don't know. But my  
9 druthers might be that we don't. Anyway, we're  
10 moving barriers of friction points to make it  
11 happen.

12 MR. COTE: Appreciate that  
13 perspective, and that's helpful. You touched on  
14 our second question, as well, in terms of  
15 ownership. An intrinsic question is really  
16 tight, what I'll call PHMSA or federal ownership  
17 of the process and program. Is that an  
18 impediment, or at least a concern as a potential  
19 impediment? Thank you.

20 MR. MAYBERRY: I see executive  
21 director in all caps, and then in not all caps.  
22 We do have a position called executive director.

1                   MR. COTE: I think that envisioned an  
2 executive VIS director, a daily senior leader of  
3 the VIS effort. Someone's got to mind the store  
4 every day. That was the underlying question.  
5 You sort of caught the essence of it, in terms of  
6 that ownership comment. Thank you. Please,  
7 Eric.

8                   MR. AMUNDSEN: Eric Amundsen, Energy  
9 Transfer. Speaking as an operator and speaking  
10 for Energy Transfer, I think there's a  
11 demonstrated willingness for operators, in  
12 general, to share information in the environment  
13 that you described. It happens today in a number  
14 of different forums, AOPL, API, SGA, PRCI, so  
15 it's happening today. We probably don't get the  
16 credit, if you will, or the recognition for doing  
17 that.

18                   I think that demonstrates that there  
19 is a willingness when safety -- when it's a  
20 matter of public safety and a matter of  
21 integrity, there definitely is a willingness to  
22 share. Speaking for our company, there's a

1 willingness to share with our regulators on a  
2 routine basis to develop and foster a really good  
3 working relationship with PHMSA.

4 We go out of our way to meet with our  
5 region directors on a regular basis. Our  
6 thinking is let's develop that relationship when  
7 things are good, so that when things don't go so  
8 well, that relationship is developed and you're  
9 not trying to develop it during a situation of  
10 enforcement.

11 There's a lot of good out of sharing,  
12 a lot of good that comes out of sharing. We  
13 recognize that. I think, again, if we can  
14 overcome these friction points, well described by  
15 Joe, and break loose and get some inertia and get  
16 some momentum, for one, Energy Transfer is  
17 willing to lead the way, or certainly be involved  
18 in that pack that breaks loose. I think we've  
19 demonstrated the ability to do that in other  
20 forums, so I don't see any reason that we  
21 wouldn't do it here.

22 MR. COTE: Appreciate that, thank you.

1 That was an excellent comment. Don't disagree  
2 that there's a fair amount of that going on in  
3 the industry. Thank you. Other thoughts or  
4 comments? I'm sorry, Randy Parker. I missed the  
5 card.

6 MR. PARKER: That's okay, Dan. Randy  
7 Parker, Kinder Morgan. With respect to PHMSA's  
8 involvement, we've had some great discussions  
9 about that recently, and today is a good one. I  
10 think from my perspective, everything I've  
11 learned, it's absolutely essential that this be  
12 done under a PHMSA umbrella.

13 How you describe that umbrella or  
14 which pieces are private and which pieces are  
15 PHMSA, we can discuss that. In order to create  
16 this environment where there's trust by the  
17 operators that if they share information, it  
18 won't get out, it won't end up in a lawsuit  
19 against them, there will be no punitive actions  
20 by state or federal agencies, with respect to all  
21 that that we need to build or else no one will  
22 come to play, with respect to all that, it needs

1 to be done through PHMSA because we need  
2 congressional intent to apply the commerce clause  
3 to PHMSA's worthy goals of pipeline safety.

4 To do that, we will be able to create  
5 that system that's very difficult to challenge by  
6 people who want to break down the VIS if they  
7 don't like it. More than anything, it will  
8 create the incentives for operators to  
9 participate. I don't think we can do that unless  
10 we have PHMSA intimately involved because that's  
11 our link to Congress and their unassailable power  
12 under the commerce clause.

13 MR. COTE: That's helpful, thank you.  
14 Again, you and I have had that conversation.  
15 Thank you. Other thoughts or comments?

16 (Simultaneous Speaking.)

17 MR. MAYBERRY: Dan, I was just going  
18 to add, I agree. It's critical that various  
19 people know if they want to keep variables as  
20 statutory, that needs to happen early on in the  
21 process.

22 MR. COTE: Got you. Thank you.

1                   CHAIR BURMAN: Before we go to the  
2 audience, is there anyone else at the  
3 subcommittee who wants to say anything? Anyone?  
4 No? On the phone?

5                   MS. PEAREN: This is Holly Pearen.  
6 I'm on the phone. I just wanted to echo Mr.  
7 Parker's statement. I think that was a really  
8 clear articulation of the importance of PHMSA  
9 involvement, in order to incentivize  
10 participation. Thanks so much for entertaining  
11 this dialog. The feedback is very helpful to the  
12 subcommittee.

13                   CHAIR BURMAN: Thank you, Holly. Now,  
14 anyone in the audience, if you want to just move  
15 forward.

16                   MR. STODY: John Stody, with the  
17 Association of Oil Pipelines. I'd say certainly,  
18 reflecting the liquids pipeline industry, we have  
19 an inherent desire to participate in this and an  
20 inherent desire to gain the benefits of sharing.  
21 That's why we're working hard to break down the  
22 barriers to what would enable that. To the



1 extent this is a surrogate conversation for  
2 should the director be a federal or a private  
3 employee, I don't necessarily have a final  
4 opinion on that, but I would very much echo what  
5 Randy said. If the director is a PHMSA person,  
6 we need a person on the inside to be a leader for  
7 this, to be a champion for it going through the  
8 budget process, working to change the culture  
9 within PHMSA in dealing with the inspection  
10 group, with the enforcement group and the  
11 programmatic group and managing up to the  
12 secretary's level.

13 There are a number of advantages for  
14 having our leader be someone on the inside that  
15 can help the program versus the opposite. If  
16 it's an industry person leading it, then in a  
17 couple years, maybe this becomes an industry  
18 thing, and it just gets shunted to the side.

19 I think there are a lot of plusses to  
20 having PHMSA engaged. Time will tell whether we  
21 have the things that make this a success.  
22 There'll be plenty of opportunities for all

1 involved to prove their commitment to making it  
2 succeed. I'm not as worried about that in this  
3 ultimate question of who should be the director.

4 MR. COTE: Thank you so much.  
5 Appreciate the comment and agree.

6 CHAIR BURMAN: Thank you. Randy.

7 MR. PARKER: Randy Parker, Kinder  
8 Morgan. I might add one other thing. We've  
9 spent months learning about the advantages of the  
10 FAA experience over the last ten years, so we've  
11 warmed up to this idea of voluntary information  
12 sharing, as long as we have adequate protections  
13 and we build the trust.

14 But people who aren't on this  
15 Committee, or people who haven't had this kind of  
16 education we've had may not see that. If they  
17 see PHMSA administrating a program, an operator  
18 who doesn't understand all this yet may say these  
19 are the same guys that just fined me last month.  
20 I'm not going to go sharing information with  
21 them.

22 I think that the PHMSA part of this

1 needs to be recognizable as an independent  
2 effort, not related to enforcement, so that  
3 whoever the leader is in PHMSA is tasked with  
4 that, so that it's visible to the industry as a  
5 voluntary program, unassociated with punitive  
6 actions or enforcement. That's just an idea, and  
7 I'd like to hear what Alan might have to say  
8 about that.

9 MR. MAYBERRY: I totally agree.  
10 That's why I mentioned earlier we will always  
11 have that program, the traditional oversight  
12 program. This is really our effort to -- another  
13 way to skin the pipeline safety cat because  
14 regardless of that oversight program, the efforts  
15 that are going on, we still have failures that  
16 happen. It's unfortunate.

17 None of us want them. What's another  
18 approach? That will be there, but this has got  
19 to be a separate -- you're really changing the  
20 paradigm. We're not in that box over there.  
21 We're over here in a very communicative,  
22 collaborative box that says we're sharing

1 information, we're sharing lessons learned,  
2 without the fear of punitive action.

3 That's the gist of it. That's how I  
4 see this working. It's critical for that safe  
5 area to be there to set up the environment where  
6 information is shared. Again, I'm not -- we're  
7 always going to have the other side, but this is  
8 another area to -- really all about sharing  
9 information, not to beat that dead horse.

10 MR. COTE: Thank you. Fully agree.  
11 Are there any representatives here of APGA or  
12 AGA, for example? Thoughts or comments on the  
13 discussion, in terms of that PHMSA VIS  
14 relationship? Would you identify yourself,  
15 first?

16 MR. TU: This is Wen Tu, from AGA. In  
17 terms of our member participation in such  
18 information sharing, with or without ownership  
19 being from PHMSA and with leadership from PHMSA  
20 and/or from the industry, I'm going to defer that  
21 to our members, honestly. I think there's  
22 certain advantages that's been already

1       communicated in this conversation, and  
2       disadvantages, as well.

3               In terms of individual member  
4       participation, that's going to be decided -- and  
5       I think that as each member sees more  
6       participation from their peers within the  
7       industry, I think there'll be more participation,  
8       but again, that decision's going to -- I'm going  
9       to defer that to --

10              MR. COTE: Let me put you on the spot  
11       and ask the question a different way. Do you see  
12       AGA encouraging its members to participate in  
13       that model out of the box?

14              MR. TU: Yes, but with a lot of  
15       qualifiers. I think that there's a lot to be  
16       decided within this group about how the data's  
17       going to be managed, how the data's going to be  
18       provided, and who has access to it. That's all  
19       being discussed within the scope of this working  
20       group.

21              The decision ultimately is going to  
22       drive the AGA recommendation to our members, but

1 certainly to at least see the benefits of  
2 information sharing in progressing pipeline  
3 safety overall. We obviously support that  
4 ultimate goal.

5 MR. COTE: Appreciate that. Just for  
6 the record, both the legal -- and Randy, I don't  
7 want to speak for your team, but both the legal  
8 and governance groups see the questions of  
9 anonymity of data, avoidance of punitive within  
10 very broad boundaries that are excluded by  
11 criminal acts, essentially, but very broad  
12 boundaries, in terms of no enforcement really  
13 gets reported through the system, obviously being  
14 absolutely essential and a baseline requirement  
15 of the system.

16 MR. TU: I would add one more thing,  
17 as well. From my perspective, we're also looking  
18 for some clarification on how the system's going  
19 to be managed. A lot of discussion about how the  
20 data will be managed and who's going to manage  
21 that data within these groups, but when we talk  
22 about being able to digest, store, and make

1 information available, there's a system component  
2 to that, as well. System architecture and system  
3 governance is something else that we're looking  
4 for some discussion about.

5 MR. COTE: That's fair. That sounds  
6 like the technology group.

7 CHAIR BURMAN: That also gets to when  
8 we have the IT architecture discussion later, as  
9 well. I think what this also shows us is how  
10 important it is, in the report, to identify those  
11 things that will be barriers and those things  
12 that are important to have in whatever the  
13 systems will be.

14 MR. COTE: Thank you, Madam Chairman.  
15 Final comments? I think we have used all of our  
16 time, but this has been very helpful. Any final  
17 comments from any members of the subcommittee?

18 CHAIR BURMAN: On the phone? Oh, I'm  
19 sorry, Eric.

20 MR. AMUNDSEN: Eric Amundsen, Energy  
21 Transfer. Randy, you bring up a great point. I  
22 think it's a management of change effort that

1 will need to take place if we move forward with  
2 this. So I think our report, that may fall under  
3 best practices, but it will be a huge management  
4 of change campaign, and we'll need to think about  
5 how we -- what recommendations we make in that  
6 regard.

7           How do we use the associations? How  
8 do we use the report, itself, to communicate all  
9 that we have learned, as a Committee, about the  
10 FAA's experience and compelling reasons for doing  
11 this? This is a major paradigm shift, not so  
12 much from sharing information in general, but  
13 sharing it in a different context, so we'll need  
14 to think about that in our recommendations and  
15 try and get our ideas and thoughts on paper about  
16 the key elements of an MOC process for it.

17           MR. COTE: That is absolutely a great  
18 point. Randy, as you said earlier -- at least I  
19 think it was you, but someone in the room said  
20 something along the lines of as we've worked  
21 this, we've all gained a clear understanding and  
22 really refined our vision around how to execute



1 this and learned a ton in the process that our  
2 industry brothers and sisters have simply not had  
3 the opportunity to do. We have a much higher  
4 level of trust that we can make this work, that  
5 the safeguards will work effectively, and this  
6 gets executed in a way that is secure and  
7 reassures everyone, in terms of our strategic  
8 intent, so critical points. To your point,  
9 translating that into something that will really  
10 resonate with our industry becomes management of  
11 change.

12 MR. BUCHANAN: Only one comment. The  
13 big guys are here, but there's a ton of small  
14 guys, small operators. We really need to think  
15 about this, really, in terms of what they're  
16 going to feel this thing is, and how will you get  
17 them to buy into it. That really has to be part  
18 of your thought process, as well.

19 MR. COTE: That sort of goes back to  
20 the trade associations helping, them hearing from  
21 multiple sources that sharing data is good for  
22 individual operators and good for our industry

1 really some of the keys. Anyhow, that being --

2 CHAIR BURMAN: Alan.

3 MR. COTE: I'm sorry.

4 MR. MAYBERRY: I just feel compelled  
5 to say this. Don't take it the wrong way, but as  
6 we look to roll it out, this is not -- this is  
7 why -- there are a number of factors here. It's  
8 not a system to hide behind a compliance issue,  
9 but it's a system to raise everyone's awareness  
10 of the challenges and really to get smarter at  
11 what's out there and how to fix what's out there.

12 I just felt compelled to mention that.  
13 I'm totally confident we can come out with a  
14 system that doesn't do that. It's not a rat your  
15 boss system, which I've heard that other systems  
16 have --

17 MR. COTE: Not a what? I'm sorry.

18 MR. MAYBERRY: Rat your boss system.

19 Anyway, thank you.

20 MR. JONES: A couple of quick points.  
21 Dan, very good job. You pretty encapsulate -- we  
22 had a lot of problems the last couple of days,

1 and he covered it all. We really need to hear  
2 from you guys. What you've said has just about  
3 solved all of our problems, I think, and made it  
4 -- I think everything is settled, pretty much.  
5 There are some devils in the details, but we're  
6 appreciative that -- I've been on many FACA  
7 committees, been in Washington for a long time.  
8 To be honest, when I came to this meeting, I was  
9 a bit shocked at the anonymity and the relaxed  
10 enforcement that the Agency was throwing on the  
11 table to get players involved. If this was  
12 occupational safety and health, certainly  
13 wouldn't have been in favor of that.

14 I would have taken the other view of  
15 this is nuts. Hold on; we're giving away the  
16 store. But the Agency has brought case study  
17 after case study and testimonial that has  
18 definitely allayed my fears. I would have to  
19 agree with Alan that I'm frustrated with the  
20 enforcement compliance paradigm, as well.  
21 There's got to be a better way.

22 I have changed my mind to this idea of

1 relaxed enforcement to encourage voluntary  
2 information sharing, so that we can skin this  
3 bird from a different angle, in terms of reducing  
4 risk on these pipelines. I just want to say that  
5 there are concerns from the other side, as well,  
6 about relaxed enforcement and anonymity, but many  
7 are looking for the big picture that this may  
8 produce. The Agency has provided enough case  
9 study to have folks encouraged. Thank you. Oh,  
10 Walter Jones, Laborers Health and Safety Fund.

11 CHAIR BURMAN: Thank you, Walter.  
12 Anyone else at the table? Michelle.

13 MS. THEBERT: Michelle Thebert. I  
14 guess when you say relaxed enforcement, what does  
15 that mean?

16 CHAIR BURMAN: Can you speak up a  
17 little bit?

18 MS. THEBERT: I'm sorry. Relaxed  
19 enforcement, I'm trying to follow what that  
20 means, exactly.

21 MR. JONES: To me, I was just -- maybe  
22 it was just a wrong term, but I was saying

1 non-punitive --

2 MS. THEBERT: Right.

3 MR. COTE: Relaxed enforcement is, I  
4 don't think, a term that I or the subcommittee  
5 would use. What we're talking about is a  
6 situation where you are an operator. If you  
7 identify a problem in your system, it may be a  
8 safety issue, or it could be a 192, what would  
9 constitute a 192 violation. You do your own  
10 independent audit of your activities. You  
11 identify it. It's identified as a concern or a  
12 risk. You report it through VIS. You create a  
13 remediation point around it, and you are  
14 addressing it. Four months later, either the  
15 state or PHMSA drop by and do a routine audit and  
16 say you're violating 192.605 because you do not  
17 have procedures that govern leak investigation  
18 and repair.

19 I'll take an extreme case for those of  
20 you that are operators. You say wait a minute,  
21 here's my draft. We're getting it approved. We  
22 found this four months ago. We reported it to

1 VIS.

2 PHMSA basically says as long as you  
3 are demonstrating that you're remediating it and  
4 that you identified it yourself, we will not cite  
5 you under 192.605 and fine you. Conceptually, I  
6 think that's what the vision is. Alan, would you  
7 agree with that characterization?

8 MS. THEBERT: Alan would have to --  
9 PHMSA would have to contact the states and say  
10 Operator B, you can't tag them for this because  
11 reported it, but Operator C didn't report it. He  
12 can get them. I'm trying to make sure --

13 (Simultaneous Speaking.)

14 MR. COTE: Right. The states are a  
15 little bit different. I'm not sure that PHMSA  
16 has absolute unfettered control over individual  
17 state programs.

18 MS. THEBERT: Some states --

19 (Simultaneous Speaking.)

20 MR. COTE: To the extent that  
21 individual states don't embrace the concept if  
22 it's recommended by PHMSA, their operators simply

1 won't join.

2 MR. MAYBERRY: It can get a little  
3 tricky there. Hard to comment on that example.

4 MS. THEBERT: I've got easier ones.

5 MR. MAYBERRY: I think even today, if  
6 an operator -- and we've seen that -- comes to us  
7 with an issue and self-discloses, it's a lot  
8 better than if the inspector happens upon it. I  
9 don't necessarily see the system for -- we're not  
10 building the system. It's really more to share  
11 information about the threats that are out there.

12 Initially, the discussion was that the  
13 directive was related to inline inspection, but  
14 we're covering the realm including distribution.  
15 We'll just have to see what gets rolled up into  
16 it. I'm a little concerned about if it'd just be  
17 a -- here, again, if you crack the door open, do  
18 you give a blank check to getting a pass? I  
19 should stop.

20 (Simultaneous Speaking.)

21 MR. COTE: In a few minutes, Randy  
22 will cover a bit of detail around those

1 expectations. Again, either we have a meeting of  
2 the minds or we don't. I guess we'll shake that  
3 out.

4 CHAIR BURMAN: This is Diane Burman  
5 from New York State Public Service Commission.  
6 Let's not forget the lessons that we learned from  
7 when FAA and the rail guys came in here. The  
8 focus wasn't in picking this over a way of  
9 getting around enforcement. It was that this was  
10 a tool outside of enforcement. It wasn't we have  
11 an issue; rush here, so we don't get tagged over  
12 there.

13 That wasn't the intent. The intent  
14 was about a way of having voluntary information  
15 sharing to help with pipeline safety, as a tool  
16 to lead to risk reduction, the risk assessment  
17 that could help us, as that tool. To the  
18 perspective of there were processes in place, and  
19 they have very clear guidelines that were  
20 established after they had the legislative  
21 authority that gave them the leeway to establish  
22 what that -- there was very clear guidelines on



1        what it would mean if you were doing something  
2        that was intentional or grossly negligent that  
3        was outside of that. It really was about the  
4        utilization of that information to have a gotcha  
5        was not to be done.

6                That was some of the processes that  
7        were in place. I think some of this will get  
8        fleshed out, in terms of looking at other drill  
9        downs, as we go further, but we're not writing  
10       the program or getting back between what it will  
11       mean for a state that wants access to that.

12               If you remember, with the FAA and the  
13       Rail, they also had Memorandums of Understanding  
14       and confidentiality agreements for other players  
15       that were going to be a part of that. It wasn't  
16       just that the industry agrees, and then we'll see  
17       what folks do. If a state wants to be a part of  
18       it and to share it, they don't just get to be a  
19       part of it to then take and use as they see fit.  
20       That's something that will have to be grappled  
21       with.

22               MR. COTE: That's a great point. I

1 won't go off the reservation too far, but all of  
2 this moves from a compliance-based model to a  
3 risk-prevention model over time. This is just  
4 one piece, for example, with SMS, which is  
5 another critical initiative that the industry is  
6 adopting to improve that. A component of SMS is  
7 self-auditing, for example.

8 To the extent you find things,  
9 obviously, you're obligated to remediate them or  
10 to implement prevention technology. There are a  
11 whole variety of other things, but again, moving  
12 us away from that traditional compliance model.

13 CHAIR BURMAN: Sherry, did you have  
14 any comments?

15 DR. BORENER: I just wanted -- Sherry  
16 Borener, from PHMSA. I just wanted to support  
17 your point and say that in the ASIAs program, the  
18 fact that the data are pooled and de-identified  
19 actually means that they can't be used in an  
20 investigation later on. Compliance is  
21 compliance. That's a pathway.

22 But you would never, then, go back to

1 the VIS data and mine it for additional  
2 information to support a case against an  
3 individual. That's really the point of  
4 de-identification. By the time it gets into the  
5 VIS, you can't find out who that was, and you  
6 should not be able to then reconstruct anything  
7 about their operations using that voluntarily  
8 shared information. They really are just  
9 separate. That, I think, is the protection.

10 DR. MURRAY: Would it work the other  
11 way around, meaning an operator who wants to say  
12 we reported this in the VIS during a compliance  
13 matter, they wouldn't be able to use that same  
14 argument?

15 DR. BORENER: No. Under their SMS --  
16 FAA has an SMS rule, where this process where you  
17 disclose issues and you do self-monitoring and  
18 self-auditing and you report your metrics, that  
19 special rule allows them some indemnification,  
20 but it doesn't change a compliance issue. If you  
21 discover a risk issue, that's different than if  
22 you're breaking the law.

1           Once you've gotten to the point where  
2           you are doing something that is enforceable, it  
3           doesn't get you a get out of jail free card.  
4           Enforcement still is going to do enforcement,  
5           it's just that there's a very big difference  
6           because we have very minimal -- we have minimal  
7           standards. There's a big difference from having  
8           a known risk to having a violation. In that  
9           space between having a known risk and actually  
10          having to take action, there's a lot of things  
11          that can be done. This encourages people to take  
12          those actions without having somebody step in and  
13          say you're on the verge of a violation or  
14          something and having a threat.

15                 It also keeps them out of the lawsuit  
16          loop. So a third party who feels that they've  
17          been damaged by an airline can't go to the VIS  
18          data, and then use it in a court date. I think  
19          that's important for getting people to involve.

20                   CHAIR BURMAN: Okay, thank you.

21          Michelle.

22                   MS. THEBERT: I guess the reason I'm

1 asking is the state's obviously distribution. I  
2 know there's somebody trying to bring  
3 distribution into it, so I guess that's one we  
4 have to figure out. Is distribution part of it  
5 or not?

6 Because when you have 50 different  
7 states, you're going to have to work with their  
8 own state laws and certain regulations they may  
9 not be able to exempt a penalty. I guess I was  
10 thinking when you report to VIS, you're not doing  
11 it just to avoid enforcement. You're doing it  
12 hopefully to -- I guess I'm seeing them not  
13 really related, but they are sort of -- joint,  
14 maybe it's notice to help -- the pipeline safety  
15 person's getting some kind of monetary benefit or  
16 some kind of non-enforcement benefit. I don't  
17 know.

18 MR. COTE: I guess just to answer your  
19 question, Michelle, nothing in the discussions  
20 we've had in the last six months excludes  
21 distribution. Adding states into the mix does  
22 add a bit of a level of complexity for individual

1 operators. But remember, in terms of our  
2 pipeline network, that is 75 percent --  
3 distribution pipe is 75 percent or more of all  
4 the pipe in the United States and --

5 MS. THEBERT: I'm not saying it's good  
6 or bad.

7 MR. COTE: -- and just that many -- at  
8 least that percentage of federally reportable  
9 incidents today. I think we concluded early on  
10 that if we leave distribution out, we're sort of  
11 missing the boat in driving a lot of incremental  
12 pipeline safety.

13 MS. THEBERT: I'm not saying that's  
14 right or wrong.

15 MR. COTE: Now having said that, yes,  
16 that will -- just the states being in the mix may  
17 add a level of detail that I think will sort  
18 itself out pretty quickly, but it is something we  
19 will wind up dealing with, no question. Having  
20 said all of that --

21 MS. THEBERT: Some states have a lot  
22 more -- mirror the Feds regulation, so it's going

1 to be a task.

2 MR. COTE: Yes, some states have their  
3 own almost independent codes more stringent than  
4 192. That's true. Having said all of that, I  
5 think, as a committee, we got the guidance we  
6 were looking for, so we certainly appreciate it.  
7 Any final thoughts before we wrap it up?

8 MR. MAYBERRY: I have one quick  
9 thought, just related to -- to the extent that we  
10 make statutory changes, Michelle and Joe, and to  
11 the extent that we change the regulations, then  
12 it will become part of our annual state audit.

13 We would look to the states to -- the  
14 agreement covers that you adopt the federal  
15 minimum standard in the state law, and then we  
16 inspect against that. So to the extent there was  
17 a gap in the state law, it could impact -- it's  
18 the whole point system, ultimately, that we would  
19 look to the states to adopt whatever federal  
20 regulation would be relevant to this and would be  
21 inspecting against that. So the impact, like I  
22 said, could be an impact on the points that we

1       award to states.

2                   DR. MURRAY: I think there need to be  
3 more points -- state law.

4                   MR. MAYBERRY: My goal is for --  
5                   (Laughter.)

6                   MR. MAYBERRY: -- not to lose any.

7                   CHAIR BURMAN: I just want to say,  
8 though, that I think, again, we're getting into  
9 trying to figure out how a state may try to upend  
10 the program. That's where it comes into the  
11 congressional intent, as well as the actual  
12 statutory authority.

13                   So it's not really about getting back  
14 to since you're being a part of this voluntary  
15 information sharing system, everything that you  
16 shared with them, you now have to share with us.  
17 That would go against the congressional intent.

18                   I think that's sort of the things that  
19 we need to look into, I think. In the report,  
20 rather than getting into trying to figure out  
21 every scenario, more about needing to address the  
22 issues of ensuring that this -- that there are



1 not players who are going to upend the goals and  
2 the intent and needing that to be very clear in  
3 whatever statutes are put into place. I think  
4 that's how we try to address some of these  
5 issues.

6 MR. COTE: Couldn't agree more.  
7 That's very fair. Thank you. Thank you for the  
8 time. Thank the Committee and our guests for the  
9 input. Thank you.

10 CHAIR BURMAN: Now we're going to go  
11 to the next -- process sharing is the next  
12 subcommittee. We're going to pull that up and  
13 report out for that.

14 MR. HERETH: I'm Mark Hereth, with the  
15 Blacksmith Group, the chairman of this  
16 subcommittee. If you'll go to the next slide,  
17 please. This shows our subcommittee members, our  
18 alternate designated federal official, Sherry  
19 Borener.

20 Sherry brings the added benefit of  
21 having worked in ASIAs in the FAA system, so  
22 she's been a tremendous asset for us. You can

1 see the list of our members there. We added  
2 three in the last month or so, Warren Randolph,  
3 from the APGA side, Drew Hevle from the gas and  
4 liquid operator side, and -- I'm sorry; Warren  
5 Randolph is from FAA. I'm sorry. Warren has  
6 presented to us before and wanted to meet with us  
7 yesterday, but had a prior commitment.

8 Drew Hevle, from Kinder Morgan, and  
9 Jim Crowley, I'm sorry, representing APGA.

10 You've seen our task statement before, so I won't  
11 go into that in any great detail. There's  
12 nothing that we've done recently that I think  
13 would cause us to revisit that, but we're always  
14 open to thoughts there.

15 In terms of things that we've done  
16 recently, we had presentations. We had one that  
17 was presented to us by Drew on API 1163, which  
18 this group, this Committee, will have the benefit  
19 of seeing later today.

20 We also had a presentation by Chris  
21 Warner on direct assessment, so we could see the  
22 parallels to be able to draw upon in the context

1 of direct assessment. Of course, yesterday we  
2 had a presentation from subcommittee, which  
3 others joined, on what I would characterize as --  
4 our emphasis in asking Vivek to come present was  
5 really looking at what are the essential elements  
6 that we should be considering in making  
7 recommendations about a voluntary information  
8 system. For those of you that saw his  
9 presentation, I think it was outstanding. He has  
10 a great command of the FAA system, had great  
11 knowledge and insight on the funding side of it,  
12 as well, that he shared earlier in the day.

13 I think he was very, very helpful  
14 yesterday. We had followed up working in  
15 conjunction with the Best Practices Subcommittee  
16 to get PRCI to come back and visit us with a  
17 little bit more detail and a specific proposal  
18 framework, drawing upon what they're already  
19 doing with voluntary information sharing with  
20 ILI. Eric and I have been coordinating that.

21 Eric is actually on the board of the  
22 PRCI, or the executive committee, I guess.

1 That's in play, and we'll be bringing that back.  
2 I suspect that's something we'll want to  
3 recommend for August, so we'll talk with you guys  
4 about that. We're also -- one of the things that  
5 came out of a couple of our meetings yesterday is  
6 that we want to make sure that we have good  
7 coordination between the subcommittees and that  
8 we're not overlapping or doing the same work in  
9 developing the report. We're actually going to  
10 have a meeting on July 2nd. It will be, for  
11 those of us in Houston, probably face to face,  
12 but we'll have -- we're going to do a web  
13 meeting, so that anybody can join that.

14 Our purpose is to make sure that we're  
15 aligned among our sections, and also no overlap.  
16 We thought that would be best to be the Process  
17 Sharing, Best Practices, and Technology  
18 Subcommittees. We welcome the others.

19 I think we find that we're going to be  
20 taking more direction from governance and mission  
21 and from legal and the budgeting side, so we saw  
22 the places where there's a real tendency or

1 potential to have overlap was with best  
2 practices, process sharing, and technology.  
3 We've just seen that, so we had some discussions  
4 yesterday about how to clarify that.

5 We've decided we're going to create  
6 annotated outlines. We'll get those out in  
7 advance. Then we'll actually meet on July 2nd to  
8 try to work through that, again, to make sure  
9 we're aligned, but also that we don't have  
10 overlap and that we're pointing to each other. I  
11 know, for example, in process sharing, we're  
12 going to be pointing to best practices because we  
13 may have a set of recommendations, but they will  
14 rely on what best practices has described. The  
15 final point that was raised -- and this has come  
16 up a couple times, but it was raised again  
17 yesterday, so I think we'll spend some time on  
18 this, is what are the expectations of each of our  
19 stakeholder groups, particularly in what we share  
20 and how we share that?

21 We'll take that one. I think it was  
22 a great suggestion. We'll take that one and do

1 some work on that. We have representation on the  
2 committee to help us, I think, make that happen.  
3 Any questions or comments on ongoing work?

4 CHAIR BURMAN: Anyone the phone?  
5 Holly? Anyone in the audience?

6 MS. PEAREN: No comments other than to  
7 commend the efforts to coordinate between  
8 subcommittees, at this point. I think that's  
9 going to be really helpful.

10 CHAIR BURMAN: Thank you.

11 MR. HERETH: Good. Thank you. The  
12 other thing that I wanted to do was show  
13 generally where we are with respect to our report  
14 outline which, as I mentioned, we'll further  
15 annotate prior to our July meeting with the other  
16 subcommittees. We think, at the very outset,  
17 that we had a discussion on the interrelationship  
18 with the safety management system. That might  
19 ultimately go into an introduction in this  
20 document, but it's so essential to how we share  
21 and the processes we use to share that we thought  
22 we'd tackle it here.

1                   Then, ultimately, you all can decide,  
2                   the Committee can decide and the leadership can  
3                   decide where it best fits. I know it's something  
4                   that Sherry and others from the FAA side have  
5                   helped us see, so we'll try and tackle that.  
6                   We'll revisit the categories of information  
7                   sharing, and I'm going to talk about that a  
8                   little bit more in a moment.

9                   The next two topics we think are  
10                  really important, which are when we go to make a  
11                  recommendation, what are the things that are  
12                  really critical, what we're calling essential  
13                  elements of a voluntary information sharing  
14                  system? How do you make it stand up and make it  
15                  effective? The second one, which is -- I think,  
16                  Dan, you referred to it a bit in your comments,  
17                  so I think we're going to want to have some  
18                  interaction here. As you recall, we had a  
19                  discussion about this in one of our subcommittee  
20                  meetings a couple of months ago, which is what  
21                  can we do to make VIS compelling, which is one of  
22                  the things I think Dan was trying to tackle.

1                   Ultimately, where that may fit, it may  
2                   fit best in governance, but our subcommittee's  
3                   done some work there, so we'll want to capture  
4                   that. We'll describe what we think an  
5                   information hub looks like. You've seen a  
6                   diagram that we created, I believe, back in  
7                   April.

8                   Then we thought we'd have a series of  
9                   case studies. This is one of the places where  
10                  we're going to want to interface with the other  
11                  groups because I think the Technology  
12                  Subcommittee has the idea of doing this. When I  
13                  saw some of theirs yesterday, I think it caused  
14                  us to maybe relook at how we might do this.

15                  One of the things we want to do is to  
16                  have some tangible evidence of how this is done  
17                  and how it works, so that people, when they read  
18                  this, benefit, as Randy, I think, you pointed  
19                  out, that they have the benefit of knowing what  
20                  we know. So we think case studies or examples do  
21                  that, and we'll coordinate with the subcommittees  
22                  on how to best do that. I think the Technology



1 Committee has a good way of looking at that,  
2 having sat in their meeting yesterday, so we'll  
3 draw upon the strengths there.

4           Once we get this further annotated, we  
5 began to ask for assistance in writing  
6 assignments yesterday. We were overwhelmed by  
7 the number of people that came up to us  
8 afterwards. No, just kidding. We know that  
9 people are ready and willing to help in that  
10 regard.

11           One thing I just wanted to go back to  
12 briefly was several meetings ago, I think,  
13 actually, Dan Cote and Eric helped us see an  
14 initial framework for information sharing types.  
15 They were captured in the first three, which are  
16 really learnings from routine use of assessment  
17 technology, a second being learning from  
18 reportable incidents and accidents, and even  
19 possibly near misses.

20           You'll note that we have the tie here  
21 to the SMS sections in this case to the section  
22 number in the APIRP 1173 document. We're going

1 to try to retain that throughout here, so that we  
2 always have a tie to SMS. Then there's a third  
3 one, which is learnings with our public  
4 stakeholders. I think we've not lost any focus  
5 or emphasis on those first three, but I think  
6 what we've seen, over time, is people have helped  
7 us see possibly two others.

8 I'm going to give Dr. Cote credit for  
9 No. 4. We heard this yesterday from Vivek, from  
10 the FAA, is that there are opportunities to have  
11 learnings about specific risks. That includes  
12 risk, risk assessment, risk mitigation, barriers,  
13 if we want to call them that.

14 We think those are important, so our  
15 subcommittee will spend some more time with  
16 those. Those are likely outcomes from this  
17 information sharing. Then sharing of specific  
18 assessment data, we'll go back and spend some  
19 additional time with that.

20 I think our discussions, frankly, with  
21 the Technology Subcommittee yesterday helped us  
22 see that. Any thoughts or comments on those?

1 Again, this is a place where we would welcome  
2 other input. It was very interesting, yesterday,  
3 that Vivek made the comment about the importance  
4 of sharing learnings with our public  
5 stakeholders. It was really good to hear him say  
6 that because I hadn't heard that, I don't think,  
7 as clearly as when he said it yesterday, so it  
8 reinforces the importance. I think we would all  
9 say that it needs to be on there, but I think it  
10 reinforces it.

11 MR. COTE: Mark?

12 MR. HERETH: Yes.

13 MR. COTE: This is Dan Cote. Just a  
14 comment. In my mind, I love what you have up  
15 there, but particular around 2. One of the  
16 things that I've found frustrating over my career  
17 was being aware of reportable incidents,  
18 obviously, particularly sensational ones that get  
19 a lot of publicity and potentially serious  
20 property damage, or even fatalities.

21 Sometimes it takes us a couple of  
22 years, as an industry, to really understand what

1 caused those. Typically, the investigation  
2 chain, let me say, is a lot shorter than that.  
3 People know. It doesn't take two years to figure  
4 out what really went wrong in most of those  
5 cases. Yet, because of the historic litigation  
6 model and confidentiality and all of the  
7 impediments to information sharing, a lot of us  
8 who may have those risks can't react to them  
9 because we don't know. One of the things that I  
10 would love to see come out of this strategically  
11 is more willingness on the part of the operators  
12 who have those to share data on risk avoidance  
13 much sooner than actually comes out of the  
14 ultimate litigation or whatever regulatory  
15 process may occur.

16 In my mind, that's critical. One of  
17 the absolute keys to this is knowing quickly what  
18 went wrong. If we have those risks as other  
19 operators, we move quickly to prevent them. We  
20 don't, in my mind, at least in the distribution  
21 business, we don't do that particularly well  
22 today at all, and it's a critical outcome.

1                   MR. HERETH: Dan, this is Mark Hereth  
2 again. I would say that's -- I think all of us  
3 would share your concern there. I think that we  
4 had a really key learning yesterday from the  
5 representative from the Center of Offshore  
6 Safety. The way in which she described how they  
7 don't focus on root cause, and they look at  
8 opportunities for improvement, that, they find,  
9 is a way -- and I don't want to put words in that  
10 person's mouth, but I think that was a really key  
11 learning yesterday to see the focus that they use  
12 there. I think we all share your concern.

13                   MR. COTE: That's a great point.  
14 You're right. That's another way to skin the  
15 cat.

16                   MR. HERETH: I thought that was a  
17 really key learning from yesterday. It's a  
18 concern that we all need to have.

19                   MR. COTE: Thank you.

20                   DR. BORENER: Sherry Borener, from  
21 PHMSA. One of the things I think that -- he  
22 talked a lot and told you a lot of things all at

1 once, but he talked about Infoshare. I think  
2 some of you have been to Infoshare. There are  
3 lots of ways and levels to get engagement.  
4 Infoshare, which started with 10 people and is  
5 now 1,000, is a room where people talk about  
6 their information, period.

7           They don't necessarily come there to  
8 do analysis. Sometimes they present analysis at  
9 this time, but that's exactly the initiation --  
10 that was the way people came in the door, in a  
11 lot of cases, is to come in just to share  
12 information, findings from incidents or trends  
13 that they're exposed to, and then using that  
14 platform, they developed the kinds of topics,  
15 like specific risks, that they would go back and  
16 study in ASIAs. For process sharing, the  
17 question is how do we get people to the table and  
18 keep them there?

19           I think that's one of our big issues.  
20 What gets people in? What makes them want to  
21 stay? I think we can have a lot of levels of  
22 engagement that don't require a lot of additional

1 regulatory action to get people started in an  
2 idea and building trust well before they're  
3 actually engaged in the full information sharing  
4 platform.

5 MR. WARNER: Chris Warner, from Mears.

6 I want to follow on from what Dan said about  
7 concerns that I think companies will have about  
8 legal lawsuits regarding incidents and sharing.

9 I was interested to hear Vivec say,  
10 yesterday, if I'm remembering correctly, that  
11 companies were actually finding that it was  
12 better to say they were involved in this process,  
13 even though that may provide some vulnerability,  
14 in terms of the details coming out in a lawsuit,  
15 than it was to just not be involved and have to  
16 admit in court that they were blind to what was  
17 happening in the industry and how to respond  
18 appropriately to the industry. So I think some  
19 of that needs to be in our report because I think  
20 a lot of the public or operators who aren't in  
21 this room are going to be worried -- that's the  
22 first thing I would worry about is my lawyers

1 will never let me do this.

2 So some of that discussion in there  
3 talking about the learnings from the FAA around  
4 how it was a better legal strategy to be engaged  
5 in this, as opposed to segregated, might be  
6 valuable in the long run.

7 CHAIR BURMAN: Anyone else at the  
8 table? On the phone? In the audience?

9 MR. HERETH: I think that's --

10 CHAIR BURMAN: Okay.

11 MR. HERETH: Yes, that's it.

12 CHAIR BURMAN: You don't have any  
13 voting items, right?

14 MR. HERETH: No, no items for voting  
15 today.

16 CHAIR BURMAN: Okay, great. Next,  
17 we're going to be, I think, Regulatory, Legal,  
18 Funding.

19 MR. PARKER: This is Randy Parker,  
20 from Kinder Morgan. As you know, the Regulatory,  
21 Funding, and Legal Subcommittee is comprised of  
22 these members. Everyone is here, I believe,



1       except our external members, Dane Jaques and  
2       Cynthia Dominik. Dane is a former commercial  
3       pilot, also a lawyer, who has done NTSB/FAA work,  
4       and also does pipeline work.

5               Cynthia worked at the FAA for the last  
6       ten years setting up the legal processes and  
7       regulations, etc., to make the voluntary  
8       information sharing program at FAA work and to  
9       create that trust between the aviation operators  
10      and the agency with respect to this program.

11              She will typically say trust, trust,  
12      trust is what has to be created to make this  
13      work. Our task statement, really boil it down,  
14      says that we should identify any barriers to any  
15      part of the VIS system that we're looking at and  
16      to recommend ways to overcome those barriers.  
17      Let's go through -- there are eight barriers we  
18      identified, so let's just go through them one at  
19      a time. The first barrier relates to the  
20      authority and governance of the VIS.

21              One of the things that we found, it's  
22      not really clear that PHMSA has specific

1 authority to establish and maintain a VIS system  
2 or program, and it's not clear that they have the  
3 authority to enter into MOUs and other  
4 contractual arrangements necessary to establish  
5 and operate a successful VIS program.

6 Certainly, they have a lot of  
7 authority to attempt to do this, but we thought  
8 that it would be better, from the outset, to kind  
9 of clarify this. The third barrier, with respect  
10 to the authority and governance, is that  
11 operators fear that the program, while called  
12 voluntary, might be transformed into a mandatory  
13 program.

14 That would constant one barrier to  
15 participation that we should address. We don't  
16 want to discourage participation from the outset.  
17 The recommendation that we came up with is that  
18 we go to Congress. We recommend the secretary  
19 seek from Congress legislation, and direct PHMSA  
20 to promulgate regulations under that legislation  
21 authorizing PHMSA to establish a VIS, to be  
22 formed and governed in cooperation with pipeline

1 operators/inline inspection vendors, for the  
2 purpose of encouraging the voluntary sharing,  
3 collection, and analysis of pipeline integrity  
4 inspection and risk assessment information and  
5 other appropriate data, for the purpose of  
6 improving pipeline safety, transmission,  
7 distribution, and hazardous liquid pipelines.

8 PHMSA would be authorized, under this  
9 law, to enter into MOUs and other contractual  
10 arrangements with operators, vendors, third party  
11 data management contractors, states, and other  
12 entities or persons, as necessary, to establish,  
13 operate, and maintain a VIS. Neither PHMSA, nor  
14 any other agency, would require participation by  
15 any operator or ILI vendor in the VIS. So we  
16 tried to hit those three barriers with this  
17 proposed legislation.

18 DR. MURRAY: Randy, one question on  
19 the first paragraph, where you talk about the --  
20 in cooperation with. It's just more of a  
21 question. Where would the state regulators or  
22 the states fit in there?

1                   MR. PARKER: In terms of the  
2 cooperation?

3                   DR. MURRAY: Right.

4                   MR. PARKER: I think states could be  
5 on the governance pressure that we ultimately  
6 come down to as part of the Stakeholder  
7 Committee. It's possible that states could be  
8 there or fit in in other ways. But in terms of  
9 setting up the VIS, itself, we're talking about  
10 cooperation between operators, ILI vendors, and  
11 PHMSA, sort of the core participants in setting  
12 it up. The states could be included in that.

13                   (Off record comments.)

14                   MR. PARKER: I think it could be  
15 cumbersome and very -- subject to a lot of  
16 politics if you had all the states able to come  
17 in at the outset to try to shape what the VIS  
18 looked like, but it's certainly worth  
19 considering. Alan.

20                   MR. MAYBERRY: Let's see; where to  
21 start? I guess the way I envision it, typically,  
22 we would enter into an MOU with another

1 government agency, federal agency, so that's the  
2 relationship there as we look to another --  
3 leverage another entity to help us here. Then I  
4 would add that -- so our interaction with  
5 operators or ILI vendors or other third parties,  
6 to the extent we need expertise, we would  
7 probably need to have something in here that it's  
8 really not an MOU, but it would be really in  
9 conformance with the federal requisition  
10 regulations.

11 We're not allowed, really, to give  
12 free service. We have to pay for it. Just a  
13 little nuance there that we can wordsmith this a  
14 bit to just make sure we're in compliance with  
15 the FAR. Also, first and foremost, obviously you  
16 pointed out, and we've discussed the statutory  
17 changes that would be needed.

18 There are existing statutes that would  
19 need to be tweaked, but then also, we'd need to  
20 add some language related to just the whole  
21 concept of VIS, but the existing statutes,  
22 especially as it relates to how we handle

1 information from operators.

2 But it would be specific to this  
3 because, again, we still have our other program  
4 that we're working within. This is just -- the  
5 statutory changes would address setting up the  
6 ability to have this other voluntary system to  
7 work within.

8 MR. PARKER: This is Randy Parker,  
9 with Kinder Morgan. Alan, I appreciate those  
10 comments very much. I think we will have to see  
11 how this fits in with your other statutory  
12 obligations and mandates. With respect to the  
13 MOU paragraph there, we did look at the FAR  
14 requirements.

15 This paragraph comes primarily from  
16 the experience of the Federal Railroad  
17 Administration, in terms of how -- when they set  
18 up various programs, they needed some kind of a  
19 document that laid out the ground rules for  
20 confidentiality and for how the data would come  
21 in, get processed, and come back out.

22 That may be overcome by some of the

1 governance work that we ultimately land on, but  
2 at least we wanted to enable PHMSA to be able to  
3 do, maybe, agreements they've never been able to  
4 do before, in order to make this work. That was  
5 the thought.

6 MR. MAYBERRY: Okay.

7 CHAIR BURMAN: When we flesh it out,  
8 that should also be clear, so they don't --  
9 there's not a disconnect between the language  
10 here, and then that this is different from the  
11 normal processes.

12 MR. MAYBERRY: Right. We're carving  
13 this out. This isn't about diluting the existing  
14 program. This is about -- again, we have that  
15 paradigm that will remain, but then we're  
16 developing a new paradigm for.

17 MR. PARKER: Correct. This is Randy  
18 Parker. I don't think we intend to recommend any  
19 statutory provision that would be in conflict  
20 with anything that's on the books right now. We  
21 don't want to create that complication for  
22 ourselves.

1                   CHAIR BURMAN: Okay, we'll go Mark,  
2 Dan, then Kate.

3                   MR. HERETH: This is a fine point, but  
4 I think one of the things that's emerged is it's  
5 not just pipeline operators and ILI service  
6 providers, but it's also the third-party NDE  
7 companies. Whether you capture those as a part  
8 -- that they serve one or the others of those,  
9 but I think there's a three-legged stool that we  
10 have to consider there. We can't lose an  
11 emphasis -- I'm borrowing that from Carl Weimer,  
12 the three-legged stool. We need to consider all  
13 three of those because the error -- the  
14 uncertainty in those NDE measurements is just as  
15 critical as in the ILI.

16                  MR. PARKER: That's a very good point,  
17 Mark, a very good point.

18                  CHAIR BURMAN: Dan.

19                  MR. COTE: I was going down exactly  
20 the same road Mark was, ironically enough. I  
21 would like us to -- I don't want to get into the  
22 wordsmithing, but pipeline operators and inline



1 inspection vendors, that phrase, in my mind, sort  
2 of screams transmission facilities. I would  
3 think we would want to change that to something a  
4 little more generic.

5 Even though pipeline operators does  
6 define both distribution and transmission in  
7 code, a lot people won't look at the language and  
8 recognize it. So perhaps we say with  
9 jurisdictional facility operators, which casts  
10 that wider net, and various -- without being  
11 really specific, various technical vendors,  
12 something a little more broad, again, just to get  
13 us -- not that ILI isn't a critically important  
14 technology and mentioned by the legislation, but  
15 we are trying to expand that, just a thought.

16 MR. PARKER: This is Randy. I agree  
17 with you, Dan. I think we need to do a little  
18 bit of tweaking on this one.

19 MR. COTE: We'd love to help --

20 MR. PARKER: Okay.

21 MR. COTE: -- if that's beneficial.

22 MS. BLYSTONE: Kate Blystone. Just a

1 little more tweaking. The one thing that I feel  
2 like this lacks -- and I like it, generally, with  
3 the exception of the things the two gentlemen  
4 before me mentioned -- I would love to see it  
5 tied with a time frame because I'm slightly  
6 concerned that all of this wonderful work we're  
7 doing doesn't happen.

8 It would be great that if -- maybe  
9 Congress should enact legislation within the  
10 reauthorization of the -- or something you guys  
11 tool with that, but it would be great if we could  
12 say within the next five years or within some  
13 time frame, so all this great work doesn't get  
14 lost.

15 MR. PARKER: This is Randy Parker.  
16 Yes, Kate, I agree with you on that. Matter of  
17 fact, our subcommittee is assuming that we're  
18 trying to get this done this year. We will get  
19 this done this year, Madam Chair.

20 DR. MURRAY: Right, December 2018.

21 MR. PARKER: And it will hopefully be  
22 something that --

1 DR. MURRAY: December 18th and 19th,  
2 to be exact.

3 MR. PARKER: There you go. So the  
4 recommendations we deliver to the secretary can  
5 be used, if she desires, in the reauthorization  
6 process. I agree with you. It would be very  
7 good to have a date to drive these things forward  
8 because, as you know, you can work on things  
9 forever and not really get there.

10 CHAIR BURMAN: Just a couple of  
11 thoughts. This is really a draft recommendation  
12 for the report, and some of what will get fleshed  
13 out will be facilitated by other aspects of other  
14 things that we're working on.

15 To the extent that we're looking at  
16 the legislation, potentially, as the pipeline  
17 reauthorization legislation, that's something  
18 that could come out in the report, if  
19 appropriate. Also, some of the things that are  
20 necessary, in terms of facilitating a  
21 non-disconnect with ongoing PHMSA processes and  
22 legal authority will also be fleshed out in some

1 of the wording in the report. But to the extent  
2 that I just want to flag that ILI had been a  
3 specific topic of conversation in the first two  
4 meetings because we were stuck in what the  
5 legislation said, this is about enacting  
6 legislation for the future.

7 We don't necessarily need to be stuck  
8 in some of that wording, and we should make clear  
9 what some of our focus is and our intent is, if  
10 it's broader than ILI. That gets into the  
11 underpinnings of what we did in the first two  
12 meetings that led to the mission statement that  
13 made it a little broader. So to the extent that  
14 we flesh out from that, it ties in nicely when we  
15 get to the recommendation.

16 MR. PARKER: I agree very much that we  
17 need to have that in the report and that we need  
18 to revise this particular recommendation to make  
19 that clear that we made that transition. Scotty  
20 --

21 PARTICIPANT: I would like to see  
22 labor included up there, as far as being a party

1 to an agreement like that.

2 MR. PARKER: To the formation of the  
3 VIS?

4 PARTICIPANT: Yes.

5 CHAIR BURMAN: I'd also, then, with  
6 that -- thank you; that's a good point. We did  
7 have, I think, at our last meeting, a pretty  
8 lengthy discussion that's in the transcript that  
9 got into how much we needed to clearly identify  
10 all the different stakeholder groups.

11 I think it lasted about an hour, the  
12 conversation, and we were grappling with the  
13 entire bucket or how do we summarize it. I think  
14 going back to that transcript will be helpful  
15 because there was some conclusions made at that,  
16 and I think we could take the lessons from what  
17 we said in our last meeting and refresh our  
18 memories, as well.

19 MR. PARKER: Thank you, Madam Chair.  
20 That's a great idea. I'll go back to that  
21 transcript and have the subcommittee look through  
22 that and make sure it's consistent.

1 MS. BLYSTONE: Kate Blystone. I  
2 think, actually, that is reflected in our mission  
3 statement, that list that we ended up on. I just  
4 conferred with my buddy, Mark, here. I think it  
5 is, so you don't even have to read the whole  
6 hour.

7 MR. PARKER: It's right in there.  
8 Okay, save me some time.

9 CHAIR BURMAN: But it was riveting.

10 MS. BLYSTONE: Edge of your seat  
11 stuff.

12 CHAIR BURMAN: I do think that is  
13 something to keep in mind. There were a lot of  
14 these discussions that I think it would be  
15 helpful if we did have someone tasked with going  
16 through the transcripts just to keep in mind if  
17 certain things that we have gone down are  
18 consistent with where we were. Even if we have  
19 changed our position, I think it's important to  
20 note where we changed it and to flag it for us.

21 MR. PARKER: I agree. It's a very  
22 healthy process.

1                   CHAIR BURMAN:  Anyone else?  On the  
2 phone?  Oh, wait, Dr. Murray.

3                   DR. MURRAY:  This conversation just  
4 reminds me when we're looking at recommendations  
5 across each subcommittee, A, to the point I heard  
6 earlier from Mark about integrating, having a  
7 meeting to integrate, I think that's going to be  
8 key because some of the things that you hear  
9 talked about -- I think, Mark, you presented on  
10 the types of information, and you have some clear  
11 categories, like the public, there was learnings  
12 from the public.  But when you look at this, for  
13 example, it doesn't necessarily include the  
14 public, but there's an expectation that they may  
15 likely provide learnings.

16                   From that integration standpoint, you  
17 might want to consider the Regulatory Funding  
18 Committee, just to make sure that consistency  
19 Diane talked about, it matches up to what the  
20 other recommendations will be.

21                   MR. PARKER:  That's a good idea.  With  
22 that said, let's go to the next one.  The second

1 barrier we looked at was funding. Of course, we  
2 learned a lot about funding yesterday from Vivec,  
3 but our subcommittee concluded that the lack of  
4 consistent adequate funding to stand up and  
5 sustain the program would deny the public many  
6 benefits from improved pipeline safety and fewer  
7 incidents.

8 MR. PARKER: We also realize that  
9 budget requests to Congress are going to require  
10 support from the government and industry  
11 champions. How do we get over those barriers?  
12 We recommend that the secretary ask Congress to  
13 authorize and appropriate consistent funding for  
14 establishing and sustaining the VIS at levels  
15 adequate to achieve the goals of the VIS.

16 Language should be added to the  
17 Pipeline Safety Reauthorization that authorizes  
18 appropriations for VIS for the next five years.  
19 The VIS would provide high quality data that's  
20 needed to drive safety management systems. An  
21 investment analysis that quantifies the safety  
22 benefit of the VIS would justify the budget



1 request to Congress. That's a lot in that  
2 recommendation for thought and discussion.  
3 Sherry.

4 DR. BORENER: Sherry Borener, from  
5 PHMSA. I just want to talk about this last thing  
6 about the investment analysis. This is a  
7 peculiarity of FAA, that they have a very long  
8 investment analysis process. You may not have to  
9 do that, but because it's an IT investment -- and  
10 I don't know the details of this; I can find out  
11 -- but because on our part, it would be an IT  
12 investment, it might have to go through an IT  
13 investment analysis process at DOT. It would  
14 come under the CIO. That's a technical issue  
15 that you're introducing by having PHMSA be the  
16 manager. That's just a topic that I think -- you  
17 don't need to necessarily deal with that  
18 specifically in the recommendation, but it's  
19 something we can find out for you.

20 MR. PARKER: Thank you, Sherry.  
21 That's important. We were thinking of the IT  
22 investments when we added that particular one.

1 DR. BORENER: If you have to follow  
2 that process, that would be one thing, but maybe  
3 you don't have to.

4 MR. PARKER: Maybe we don't. Okay,  
5 great.

6 CHAIR BURMAN: Diane Burman, from the  
7 Public Service Commission of New York. I think  
8 part of the investment analysis in quantifying  
9 the benefit and justifying the budget request  
10 really also comes about from the explanation of  
11 that, where we're having to showcase that we  
12 prevented incidents. That's a very hard  
13 quantifier when you don't have the incident,  
14 necessarily, to say look what we've done. I  
15 think some of this is needing to flesh out the  
16 analysis in justification for how beneficial it  
17 is and what's the quantification, rather than a  
18 strict benefit cost analysis, and others that  
19 would be typically done, looking at those things.  
20 Sherry.

21 DR. BORENER: Yes. Further, the  
22 department is very much involved with, for

1 instance, Waze and Lyft and various other data  
2 collection repositories for information sharing,  
3 and they're working on that for federal highways,  
4 for accident risk, for passenger fatality risk.  
5 They have a model for information sharing with  
6 industry on very detailed data.

7 I don't think they went through an  
8 investment analysis process to decide yes, it  
9 would be a great idea for us to get Waze data. I  
10 think we want to see what they're doing, but  
11 that's just an action that we can work on  
12 offline.

13 It doesn't have to be -- this isn't  
14 really painful. The FAA process was painful, and  
15 it was \$1 million. If we could find a way to get  
16 you through that without having to go through  
17 that process, that would be better.

18 MR. PARKER: Great. I'm all for that.  
19 Alan.

20 MR. MAYBERRY: Alan Mayberry. I was  
21 going to say, I guess rightfully so, IT projects  
22 are under a lot of scrutiny these days from the

1 federal government. I know at least now -- we're  
2 in a three-year cycle. Currently, we're in the  
3 2020 budget cycle to request funding.

4 Where we don't have the report yet,  
5 it's a bit of a challenge, but I think we have  
6 some options for at least providing -- no  
7 guarantees, but at least to cobble together  
8 something. The FAA alluded to that, really,  
9 yesterday, about how you use expiring funds and  
10 the like, but I think we may have some  
11 flexibility to at least get the ball rolling as  
12 we go forward, working within our existing  
13 budget.

14 MR. PARKER: That's good to know.

15 MR. MAYBERRY: Certainly, that's not  
16 sustainable, though, but we do need to start  
17 somewhere, and that's how I think we'll start.

18 MR. PARKER: Okay, thank you. Dr.  
19 Murray.

20 DR. MURRAY: Food for thought -- and  
21 this is just food for thought. As we're talking  
22 about funding, this may be a good time to talk

1 about a phased approach to the development of  
2 this system, which aligns very well -- I know  
3 it's very heavily system development focused,  
4 initially, to get it off the ground, with some  
5 accompanying other people/process components to  
6 it, both internally, to the federal government,  
7 and externally.

8 I would just throw out, for food for  
9 thought, to consider some sort of a system  
10 development lifecycle approach, as we're thinking  
11 about it from a funding standpoint, because that  
12 will allow some of the up-front analysis to take  
13 place, the opportunity to create requirements  
14 based on user needs.

15 Your funding can very nicely parallel  
16 that sort of a process approach, so it'll help to  
17 lay out the foundation of what you'll need in  
18 subsequent years, as you look for that. Also, it  
19 allows for natural check gates or exit gates. In  
20 order to clear to the next process, you've got to  
21 have some deliverables or outcomes achieved and  
22 decisions made to move forward, which would tie

1 nicely with how you're funded, so just for  
2 consideration for the Committee.

3 MR. PARKER: That's very important.  
4 We will have to -- our committee will have to  
5 work closely with the other subcommittees, in  
6 terms of how they see those phases coming in.

7 MR. CRADIT: Jason Cradit, CRC. In  
8 the Technology Subcommittee, we've absolutely  
9 talked about a phased approach. We'll allude to  
10 that today in the IT architecture discussion this  
11 afternoon. It was a topic of discussion I want  
12 to make sure we talk about in that July 2nd  
13 meeting with the other committees because it's a  
14 point of integration.

15 What we're going to look to focus on  
16 is minimum viable product. If you had this  
17 information and shared this information and used  
18 this type of a structure to process it, you could  
19 have this kind of reporting mechanism at the end.

20 I think it was Mike's recommendation  
21 in our subcommittee to talk about that. I  
22 appreciate that. We're going to allude to that

1 this afternoon, but I think it's an integration  
2 point, to Christie's earlier point.

3 MR. PARKER: Thank you, Jason. That's  
4 very good. Mike, did you want to add anything to  
5 that?

6 MR. LAMONT: No, I think that's well  
7 said.

8 CHAIR BURMAN: Holly, on the phone?  
9 Anyone in the audience? We have two.

10 MR. STODY: I think we can give this  
11 some more thought, and also not overthink it.  
12 It's certainly the case that the appropriators  
13 have not responded favorably to past PHMSA  
14 information requests, database requests. I'm not  
15 saying that to pre-judge this one, but there are  
16 certain chunks of money that are within the  
17 comfort levels of the appropriators.

18 Plus, you go in and you make your  
19 policy and political case -- I don't mean  
20 partisan, but you just go in and you state your  
21 case. You go in and state your case. Sometimes,  
22 you want to strike while the iron is hot and you

1 have the justification for it. You get the money  
2 that you need.

3 If you ramp up, they won't really be  
4 able to digest or care, or maybe they'll even be  
5 suspicious. It's like you're trying to get the  
6 camel's nose under the tent now, and then this  
7 thing's going to become larger later down. We  
8 can give a lot more thought to this, but I think  
9 we should be cognizant not to recommend  
10 something, folks that go to the Hill or develop  
11 presidential -- the president's budget requests  
12 or work this through DOT and those processes, we  
13 have to be cognizant of those processes to gauge  
14 a recommendation.

15 Obviously, you all can recommend  
16 whatever you want, but there can be -- there's  
17 potential for some interplay on the strategy of  
18 are we trying to recommend what we think we can  
19 get or recommend what we have a plan to try and  
20 get or recommend what we think would be ideal?  
21 Those are all strategy questions.

22 MR. PARKER: Thank you, John. Anyone



1 else?

2 MS. RODRIGUEZ: I'm the tech writer,  
3 so if everyone could just speak a little bit  
4 louder because the air conditioner is competing  
5 with everyone, just so I can make sure I capture  
6 everything. Thank you.

7 CHAIR BURMAN: Thank you. Anyone  
8 else?

9 MR. TU: Wen Tu, AGIA. Jason, when  
10 you were talking about minimum viable products, I  
11 do want to make a recommendation for the  
12 Committee and the subcommittee to also consider  
13 and compare the NBP (phonetic) against the  
14 benefits that the operators will see, and all the  
15 stakeholders will see, and share that those  
16 aren't deferred into Phase 2 or 3.

17 With those funding concerns and making  
18 sure that the benefits are there to the  
19 discussion this morning about how to entice  
20 operators to participate, making sure that does  
21 happen within that.

22 MR. PARKER: Any other questions on

1 this particular recommendation before we move on?  
2 Okay, we'll go to No. 3. Barrier No. 3 is about  
3 disclosure of information.

4 The barrier we'd identified is the  
5 participation in the VIS is highly unlikely,  
6 unless the participants are confident that the  
7 information submitted to the VIS will be  
8 protected from disclosure, including personal  
9 confidential information, confidential  
10 proprietary business information, commercially  
11 sensitive information, sensitive pipeline  
12 security information, information that has not  
13 been properly de-identified, information that  
14 could be used by PHMSA or other agencies for  
15 enforcement action, and information that could be  
16 used in litigation. That's the primary fear that  
17 would-be participants have.

18 Our recommendation with respect to  
19 that barrier is that Congress should enact  
20 legislation and direct PHMSA to promulgate  
21 regulations providing that neither PHMSA, nor any  
22 other federal or state agency, nor any person,

1 shall disclose information that was voluntarily  
2 provided to the VIS, expressing the intent of  
3 Congress to encourage industry participation in  
4 the VIS, in order to further the goal of  
5 improving pipeline safety.

6 PHMSA would be directed to issue  
7 regulations for the protection of confidential,  
8 proprietary, sensitive commercial and sensitive  
9 pipeline information provided to VIS.

10 PHMSA would be directed to issue  
11 regulations governing the use or publication of  
12 summary reports or analysis, based on  
13 de-identified VIS information. The thought here  
14 was to embody in the statute directly the  
15 protections that we want to hold out there to  
16 encourage participation in the VIS, but also  
17 allow PHMSA the flexibility, under its regulatory  
18 rulemaking ability, to shape that agenda. Any  
19 questions on this one, or comments?

20 MR. WARNER: Hey, Randy.

21 MR. PARKER: Dan. Oh, I'm sorry.

22 MR. WARNER: Randy, Chris Warner, from

1 Mears. If I remember, yesterday FAA had a  
2 similar promulgation that they used. I was  
3 wondering if this is based on the language from  
4 that?

5 MR. PARKER: It is.

6 MR. WARNER: That may be important to  
7 communicate in the write-up, too, that this is  
8 not something that we're coming up with that has  
9 an historical basis for being done elsewhere.

10 MR. PARKER: We plan on putting that  
11 in the report, Chris, so that we can tie where we  
12 relied on past successes by the government and  
13 information sharing programs, like the FRA and  
14 ASIAs, etc. We'll put that in there as a  
15 support, probably in a footnote with an  
16 attachment, so you can go look at it.

17 MR. WARNER: When I look at this  
18 initially, it seems like quite a stretch, but  
19 knowing the FAA has done something similar makes  
20 it more reasonable.

21 MR. PARKER: Right. It's built on  
22 their statute. Dan.

1           MR. COTE: This is Dan Cote. Just to  
2 tie this together, from a governance perspective,  
3 we operationalized that with some strict  
4 language, as well, around the notion that this  
5 would be solely -- this confidential data would  
6 be solely in the hands of a third party, whose  
7 first obligation will be to strip out any  
8 specific location or operator identifier.

9           No one, in terms of the VIS governance  
10 -- not the board, not the executive director --  
11 no one involved with VIS management would have  
12 access to that data. Again, we tried to create  
13 some pretty clear guidelines around  
14 operationalizing this.

15           MR. PARKER: Correct, thank you.  
16 Mark.

17           MR. HERETH: Mark Hereth, with the  
18 Blacksmith Group. I think one thing that we  
19 heard yesterday in a presentation from Vivec --  
20 it may have been in the other presentation, as  
21 well -- was that the concept of actually not  
22 de-identifying until you've actually done the

1 analysis. That's one that we need to consider  
2 further. I just point that out because it's a  
3 subtlety. I think it's a learning we had  
4 yesterday. I'm not saying that we would -- we  
5 still have to decide that, as a group, if that's  
6 a direction we want to go in, but I thought it  
7 was a really interesting point, and it seems to  
8 be one that was well thought out.

9 MR. PARKER: To that point, in fact,  
10 the way we envision it operationally is that the  
11 third party would obviously know who reported and  
12 have latitude to go back and forth to make sure  
13 all the information is captured and questions and  
14 sufficient detail are achieved to provide a  
15 learning from it, to the extent that's available.

16 All of that would be in the hands of  
17 that third party, but for the third party, it  
18 would not be anonymous data. They would know who  
19 reported and what the incident was and be able to  
20 go -- we envisioned a back and forth to make sure  
21 that all the information that was required was  
22 adequately captured.

1 MR. HERETH: Thank you.

2 MR. PARKER: Any other questions or  
3 comments on this prohibition against disclosure?

4 CHAIR BURMAN: At the table? Alan.

5 MR. MAYBERRY: I just want to make  
6 sure we're clear that we're not developing an  
7 alternative regulatory approach. We're  
8 developing an information sharing system.

9 (Simultaneous Speaking.)

10 MR. PARKER: Alan, your comments are  
11 in the transcript, but I agree with them.

12 CHAIR BURMAN: Anyone in the audience?

13 MR. STOODY: I'd just make the  
14 comment, it's inherent for those that understand  
15 the regulatory process, but maybe through the  
16 language, when the report's written, that  
17 promulgating regulations will allow for public  
18 notice and comment, and the public will have the  
19 ability to provide comments and participate in  
20 the rulemaking process under the regulations we  
21 develop. So I think it's a good add to emphasize  
22 the notice and comment that will be afforded the

1 public as the Agency considers these.

2 CHAIR BURMAN: That's helpful to be in  
3 the report, itself.

4 MR. PARKER: Yes, we will definitely  
5 put that in the report, the comments that John  
6 just made and Alan's comments, as well, because  
7 we see this and the other recommendations as  
8 focused on having Congress pass laws clearly  
9 showing Congress's intent to set this up and what  
10 the rules are and giving PHMSA the normal powers  
11 under its authority to promulgate regulations.  
12 Nothing would change in that respect.

13 MR. MAYBERRY: This is Alan, again.  
14 Just so I'm clear, this really, it's a new  
15 approach to say we have what we have, we use what  
16 we have, but something else has got to give. We  
17 still have accidents. We still need to know  
18 more. We need to have a mechanism to share  
19 better. It's all about that. It is a new  
20 approach, but it's an approach that it's focused  
21 on sharing information. I know I've said that  
22 enough.



1 MR. PARKER: Thank you.

2 CHAIR BURMAN: Anyone at the table?

3 On the phone? In the audience?

4 MR. PARKER: Let's move to Barrier No.

5 4. Barrier No. 4 relates to the lack of  
6 participation in the VIS due to fear of potential  
7 FOIA release and potential negative consequences  
8 from such a release. This is aimed at giving  
9 PHMSA the protection they need to exclude from  
10 FOIA release information that was submitted to  
11 the VIS. The recommendation says specifically  
12 Congress should enact legislation and direct  
13 PHMSA to promulgate regulations providing that  
14 PHMSA shall not release, under the provisions of  
15 the Freedom of Information Act, any information  
16 that was voluntarily disclosed to the VIS. This  
17 particular recommendation is based on the statute  
18 that FAA obtained for its voluntary information  
19 sharing system.

20 MS. BATTAMS: This is Ahuva Battams,  
21 from PHMSA. I just am trying to figure out  
22 what's the difference between this recommendation

1 and the last recommendation?

2 MR. PARKER: The last recommendation  
3 relates to disclosure, by PHMSA or anyone else,  
4 through any means, of information that was  
5 submitted to the VIS. This relates to outside  
6 parties coming to PHMSA and saying we know you  
7 have this VIS over there. We want to see that  
8 data.

9 MS. BATTAMS: Right. I'm still not  
10 understanding what the difference is. Because  
11 under FOIA, PHMSA would be the one releasing the  
12 information. So if the last recommendation is to  
13 prevent PHMSA from releasing the information, it  
14 seems like a duplicate. Maybe I'm just a bit  
15 slow, but the -- when I was reading the last  
16 recommendation, I thought that the purpose of  
17 that language would be to make this an  
18 exemption-free statute, which would exempt the  
19 release of information under FOIA.

20 So I'm wondering if this is -- I'm not  
21 saying that's not an important thing to  
22 recommend. What I'm trying to figure out is are

1 they sort of the same thing? Recommendation 4  
2 saying please put language in so that this  
3 information is protected from FOIA, to me, is  
4 related to Recommendation 3, which is PHMSA  
5 should not release any information. Are you  
6 thinking that PHMSA should not release the  
7 information is a broader subset than just a  
8 specific FOIA request?

9 MR. PARKER: Yes. I think  
10 Recommendation 3 goes to any release of any  
11 information that was put into the VIS, by PHMSA  
12 or anyone else, through any instrumentality of  
13 release, however they might release it, through  
14 an investigation or through a press release or  
15 through an enforcement action or investigations  
16 or just accidentally or intentionally  
17 distributing information. But we thought we also  
18 needed a specific FOIA exemption, so that if  
19 PHMSA gets a demand letter to release  
20 information, they could quickly just refer to the  
21 statute. No, this is excluded from FOIA. It  
22 protects -- it makes the job easier for PHMSA to

1 fend off FOIA requests for VIS information.

2 MS. BATTAMS: It completely makes  
3 sense to me. I, personally, would consider maybe  
4 combining them, but obviously -- both points are  
5 important. I'm not trying to eliminate --

6 MR. PARKER: I think you could combine  
7 them.

8 MS. BATTAMS: Obviously up to you  
9 guys. That was what my question was.

10 CHAIR BURMAN: I think what's  
11 important is making sure that the intent is clear  
12 in the statute and that whether it's FOIA or any  
13 other mechanisms for the release of information  
14 or the sharing or the confidentiality to be taken  
15 and lifted off is not to be done, so that it's  
16 not limited to FOIA, and it's not solely as a way  
17 of saying information in your hands is not to be  
18 released. It's the data and the ability to  
19 share, that's the processes that will be set up  
20 for the anonymity, but we need to make sure  
21 what's being done with that data is very  
22 important in how, then, it is utilized. It's not

1 just don't release this information; it has to go  
2 deeper, which we get into in other provisions, as  
3 well.

4 We'll have to flesh that out, but the  
5 statute, itself, has to be very clear, but also  
6 not being perceived as limited to. Also,  
7 internally, what they do with that information is  
8 key. I do see a hand that might help us, if you  
9 want to defer to the audience member.

10 MR. STODY: A FOIA provision, itself,  
11 would be insufficient. Thus, the two  
12 recommendations, which could be combined, but  
13 they deal with different processes and different  
14 actors. FOIA applies only to PHMSA, but we have  
15 other actors within this program who would not be  
16 PHMSA, who would not be found by FOIA.

17 FOIA also is a specific process that's  
18 commonly used, but there are other processes that  
19 could occur. PHMSA could release this  
20 information because they felt like it, outside of  
21 a FOIA request. Again, whether it's one  
22 recommendation or two, FOIA is an important part,

1 but it's only one part, and there's a broader set  
2 of needs to address.

3 CHAIR BURMAN: I think that was the  
4 point that I was trying to make, too. It's  
5 important, but it's not limited to, and that  
6 we're explaining the intent. The intent needs to  
7 be in the statute about the importance of that  
8 confidentiality and what that data can be used  
9 for, similar to, in my mind, what gets inputted  
10 into a DMV system or something else.

11 There's certain strict requirements  
12 about who gets to use it and how you get to use  
13 that information and how it gets shared  
14 externally. Violation of that is very important,  
15 what that means. Those are the types of things  
16 that have to be in there so that people feel  
17 comfortable about the safety of that data being  
18 shared, and then what's used for it and how it's  
19 used and what the players are that can access  
20 that.

21 MR. PARKER: Those are great  
22 contributions, Madam Chair and John Stody. We

1 will definitely work on making sure that the  
2 intent is clear.

3 CHAIR BURMAN: Dr. Murray.

4 DR. MURRAY: I have to be careful with  
5 how I craft my question. In the recommendations  
6 and the barriers that have been identified, has  
7 there been consideration -- and it probably has  
8 -- for the various ways of how the VIS is stood  
9 up that -- the different ways that you can  
10 require certain actions to take place in this  
11 process, in addition to PHMSA promulgating  
12 regulations, such as other legislative means,  
13 self-executing -- just coming up with different  
14 examples -- just going back to Kate's point  
15 regarding timeliness and being strategic, I think  
16 John talked about being strategic in some of the  
17 recommendations, how that may all play out?  
18 That's probably very unclear.

19 MR. PARKER: I'm not sure exactly what  
20 the question is. We did consider a lot of those  
21 things. I think you also have to think about  
22 whatever structure the Committee decides to use

1 with the data management piece and the executive  
2 director and the board, however it's structured,  
3 you may have strong contractual provisions in  
4 there that accomplish certain things that you  
5 don't necessarily need legislation or regulations  
6 for, but they're also governed in the broad  
7 umbrella of these statutes and regulations. So  
8 even if you had an MOU that a lot of people  
9 signed, they would still be subject to the  
10 statutory prohibition about disclosing anything  
11 they learn. Sherry.

12 DR. BORENER: This is just sort of  
13 minor. Sometimes, though, you might want to tell  
14 people we know you're doing really well. If we  
15 write this the wrong way, it would be we know  
16 we're doing really well, but we can't tell you  
17 how we know. You have to be able to tell them  
18 how your evidence supports the answers that  
19 you've gotten to.

20 You want to be able to communicate to  
21 the public what you learned, without being  
22 restricted by this non-disclosure framework.



1 It's more of a comment -- for instance, in this  
2 one, you could word it that PHMSA cannot be  
3 required, under FOIA, to release, as opposed to  
4 enacting and saying that they would never release  
5 under -- so they can't be required to and,  
6 similarly, that they have the authority to  
7 restrict access to any information that's  
8 released under -- or provided under VIS, as  
9 opposed to no one can ever share. If you have  
10 that very exclusive language, my concern is then  
11 you can't show why it's working for you. Your  
12 public, at the end of the day, when you want to  
13 communicate to the public that we're doing  
14 better, we've got better trending, etc., you have  
15 to be able to use that information in some way.  
16 Your governance structure would set up the means  
17 and method by which that data -- that information  
18 would be shared, not the data.

19 MR. PARKER: Absolutely. In  
20 Recommendation 3, we talk about -- the last  
21 sentence there, PHMSA would be directed to issue  
22 regulations governing the use or publication of

1 summary reports or analysis, based on  
2 de-identified VIS information. I'm assuming that  
3 PHMSA would craft regulations, in conjunction  
4 with the Governance Committees and boards,  
5 regulations to --

6 (Simultaneous Speaking)

7 DR. BORENER: Right, whatever your  
8 governance structure is. If it's an executive  
9 board that's composed of industry and PHMSA, they  
10 would then decide under what circumstances they  
11 would release conclusions. But if you wanted to  
12 benchmark yourself against others, if you wanted  
13 to if you wanted to use the data for  
14 benchmarking, there's a lot of places where you  
15 might -- you just have to think about how to say  
16 that, so that you still have the ability to use  
17 what you found. I think that's what I'm saying.

18 MR. PARKER: That's a good point.

19 We'll have to scrub the language very carefully  
20 and not cut off those abilities to use the data  
21 in different ways.

22 CHAIR BURMAN: The one thing that I

1 just -- I don't want to take us backwards, but I  
2 do want to raise -- thinking through this a  
3 little bit with a lot of the recommendations that  
4 are recommending that PHMSA does regulations,  
5 while we've been focused, from a report  
6 perspective, of not getting too far in the weeds,  
7 in terms of writing a program and specific  
8 drill-downs, I want to make sure that we convey  
9 that the legislation and the authority is robust  
10 enough to not just say here, PHMSA, go do it, and  
11 doesn't give the tools -- enough tools in the  
12 statute.

13 My fear is that regulations can then  
14 not get done or take a different pathway that may  
15 trip us up. To the extent that some of these  
16 recommendations doesn't necessarily need to say  
17 and PHMSA should do regulations, but rather, at  
18 the end, we have a catchall that to the extent  
19 that the regulations -- we have to identify what  
20 we really are saying that we want, and then  
21 making sure that it's in the statute, per se, and  
22 that regulations flow in conjunction with that,

1 as necessary, and that the statutory language  
2 would help flesh out that. I just worry that  
3 someone reading this would say okay, good, we'll  
4 just do a three-sentence statute and be done with  
5 it.

6 MR. PARKER: Right. There's a real  
7 tension in there about whether or not to -- in  
8 each legislative piece to say PHMSA has the right  
9 to promulgate regulations or just having one  
10 recommendation that in all these statutory areas  
11 -- we had it the other way, and we changed it  
12 back to this because we didn't know how the  
13 Committee would reject or keep some of those.  
14 That's what we have to always keep in mind.

15 CHAIR BURMAN: Right. So when we go  
16 through this, when we see the full report in the  
17 draft, some of what we'll have to also do is look  
18 at what needs to be taken and maybe said in a way  
19 that leaves some wiggle room for what's in the  
20 statute and where PHMSA does the regulations. I  
21 want to just point that out. That's something  
22 that we'll need to consider.

1           MR. PARKER: We'll definitely keep  
2 that in mind. Anybody have any other questions  
3 on FOIA before we go on? Let's go on to Barrier  
4 No. 5. This relates to enforcement action. The  
5 barrier we've identified is that parties will not  
6 voluntarily share information due to the fear of  
7 potential PHMSA or other agency enforcement  
8 action or other potential punitive actions.

9           The recommendation that we came up  
10 with, after much discussion, is that Congress  
11 should enact legislation and direct PHMSA to  
12 promulgate regulations providing that neither  
13 PHMSA, nor any other federal, state, local, or  
14 tribal agency, shall take enforcement action, or  
15 other punitive action, against the pipeline  
16 operator on the basis of information voluntarily  
17 provided to the VIS.

18           Notwithstanding this prohibition,  
19 PHMSA would be permitted to use information VIS  
20 if that information is essential to the ability  
21 of PHMSA to address an imminent threat to public  
22 safety. Questions?

1 CHAIR BURMAN: Anyone at the table?

2 MR. PARKER: Do you have questions or  
3 comments on this particular one?

4 CHAIR BURMAN: Mark.

5 MR. HERETH: Actually, it's a  
6 question, which is can you give us a little bit  
7 of color on that, on the reasoning behind that  
8 last one. I think I understand, but I suspect  
9 you had some good discussion around that.

10 MR. PARKER: We looked at statutes in  
11 the aviation arena and the railroad arena. There  
12 were various exemptions made. We thought if  
13 we're going to give PHMSA an exemption from this  
14 prohibition, what should it relate to? You  
15 really can't remove PHMSA's obligation and its  
16 mandate to protect public safety.

17 So if they felt like there was a gas  
18 storage field or a pipeline underneath a lake, or  
19 something like that, that was an imminent threat  
20 to public safety, and they learned about that  
21 information through a VIS report, they would have  
22 the ability to act. They would need to act

1 because they would know about the imminent safety  
2 threat. Alan may have some thoughts on that.

3 MR. MAYBERRY: I'm sorry; say that  
4 again.

5 MR. PARKER: It's about if PHMSA  
6 looked at a de-identified report coming out of  
7 the VIS that said we have some pipelines that are  
8 cracking underneath the Great Lakes. PHMSA felt  
9 like it was an imminent threat to public safety.  
10 This should be addressed immediately. You should  
11 be able to use that information coming out of the  
12 VIS to take action.

13 MR. MAYBERRY: That would fall under  
14 the realm we currently use for issuing an  
15 advisory bulletin, if that's the case. So yes,  
16 we would still do that, although we'd have to  
17 look at how we would -- it has to be worked out.  
18 Normally, we -- it might be a descriptor of the  
19 operator. It's probably not hard to guess who it  
20 is currently, but we'd just have to address that  
21 if we did leverage the VIS information. I don't  
22 know why that couldn't work, as well.

1 MR. PARKER: Thank you.

2 CHAIR BURMAN: Dan.

3 MR. PARKER: Dan.

4 MR. COTE: Dan Cote, just a comment on  
5 that. I certainly do not object to the language  
6 and agree with what both you and Alan said, but  
7 just a comment. If this process works as  
8 designed and envisioned in governance, then they  
9 really shouldn't be able to tell.

10 PHMSA would need to have other  
11 information or data from other points that  
12 identified it because intrinsic in our vision is  
13 to strip out anything that makes that in any way  
14 visible. So if we do it correctly -- again, this  
15 would require a mix of data, not just that single  
16 data point.

17 Just wanted to make that point clear  
18 because that's part of the compact we're trying  
19 to establish with the industry, that the  
20 information really will be absolutely scrubbed  
21 and anonymous. If we don't do that, then we're  
22 sort of violating that trust.



1                   MR. MAYBERRY: This is Alan, again.  
2                   Even now, to the extent -- what's important is we  
3                   issue an advisory bulletin, it's important to get  
4                   the information out. The operator name is less  
5                   important. We typically -- I think I've seen  
6                   that work both ways, where we have or we haven't,  
7                   but what's important is to get the word out.

8                   CHAIR BURMAN: It's important, I  
9                   think, to take a moment and look at what we're  
10                  saying. Notwithstanding this prohibition, PHMSA  
11                  would be permitted to use information submitted  
12                  to the VIS if that information is essential to  
13                  the ability of PHMSA to address an imminent  
14                  threat to public safety.

15                  I'm not sure that's exactly what we  
16                  want to say or mean. I think that what we've  
17                  been focused on is that the system, itself, and  
18                  the data being put in, is done in a way that is  
19                  protective and gets to the anonymity.

20                  Then we're accessing the information  
21                  in a way, on the aggregate, that isn't putting  
22                  one particular company or one particular employee

1 at risk. Then it's not about permitting to use  
2 that information submitted to the VIS for  
3 enforcement. It's a separate situation.

4 It's similar to -- and I think we had  
5 someone speak from the FAA that talked about when  
6 they present their testimony, whatever gets said  
7 in their testimony isn't necessarily -- can't be  
8 used for enforcement. They can't share  
9 information. I can't remember exactly. It would  
10 be in the transcript. To the extent that you  
11 have to get the information from other means, the  
12 enforcement mechanisms -- it's not weakening the  
13 state's or the federal's enforcement mechanisms  
14 outside of the system. If you find information  
15 outside of that system, it can be used, just like  
16 it would be used in any other way.

17 It's that you can't try to retrieve  
18 the information submitted to use for your  
19 enforcement. I think that's critical. Because  
20 otherwise, what you'll really have is -- taking  
21 it to its extreme, you'll have people saying  
22 since what you're sharing with us is aggregate

1 data that shows that there's an imminent threat  
2 to public safety, or potential imminent threat to  
3 public safety, we don't care about any of the  
4 other stuff because the congressional intent says  
5 this.

6 So we want to retrieve and dig down  
7 and go as far as we can to retrieve that  
8 information and find out who gave that  
9 information to you. That's why I think it's  
10 important that we look at that we are recognizing  
11 that enforcement will continue, but this is not  
12 the enforcement tool or mechanism, so this  
13 information is not to be utilized in that, to the  
14 extent that there is other information elsewhere  
15 that can still be utilized, even if it came in  
16 through this mechanism. Does that make sense?

17 MR. PARKER: Madam Chair, I agree with  
18 that analysis completely. As a matter of fact, I  
19 think that you could strike the notwithstanding  
20 sentence feature from this because for all the  
21 reasons you just said, it's inconsistent with our  
22 vision of how this works.

1                   Secondly, we're just stating the  
2                   obvious. PHMSA always has the ability to address  
3                   any imminent threat to public safety that it  
4                   encounters, without other mechanisms, other than  
5                   its inherent power. So I think we should strike  
6                   that sentence as unnecessary. Alan, do you have  
7                   any thoughts on that?

8                   MR. MAYBERRY: I was just thinking I  
9                   agree because part of the success of this depends  
10                  on it being de-identified, so we won't see that.  
11                  We're dealing with public data, then, really, so  
12                  that would be an additional data source that we  
13                  would use, but again, it's de-identified. It's  
14                  the data that's posted. I think if there's any  
15                  thought that we would have a glimpse of what said  
16                  that, that would really undermine what we're  
17                  after.

18                  MR. PARKER: I think that's right. I  
19                  think that's what the Chair was trying to  
20                  describe.

21                  CHAIR BURMAN: The key is making sure  
22                  that this information is allowed to be utilized

1 in an anonymous fashion. It then gets back to  
2 what we talked about at another time about how,  
3 then, we share with the public the public  
4 information that we have. That's separate.  
5 We're really trying to make sure that people  
6 understand that this isn't a way of getting  
7 around enforcement but, yet, it's also not to be  
8 utilized as a tool to get people, as a trip up.

9 MR. PARKER: Correct.

10 CHAIR BURMAN: Dan.

11 MR. COTE: This is Dan Cote. I fully  
12 support removing that sentence. To echo, in a  
13 different voice, everything the Chair said, the  
14 optics of this, for operators who are not privy  
15 to this discussion, looks very contradictory.  
16 That's just going to create a level of confusion  
17 with all the assurance that the data's been fully  
18 scrubbed and is entirely anonymous. I just think  
19 this creates a level of doubt that will not suit  
20 us well.

21 CHAIR BURMAN: But I also will say,  
22 going back to the FAA, they talked specifically

1 about this. I'm sure that there is language that  
2 they have, either in their processes or in the  
3 specific regulations, that address this,  
4 specifically, which is really the intent that we  
5 have, too.

6 MR. COTE: To the extent it's already  
7 a clear PHMSA mandate and clearly within their  
8 purview, do we need it?

9 MR. PARKER: We don't need it, no.

10 MR. COTE: Or does it simply create  
11 confusion? That's why I like that idea.

12 MR. PARKER: Any other comments on  
13 this particular recommendation?

14 CHAIR BURMAN: Anyone on the phone, in  
15 the audience?

16 MS. PEAREN: This is Holly Pearen.

17 CHAIR BURMAN: Holly, I think you need  
18 to speak a little further away from your phone  
19 because it's muffling or something.

20 MS. PEAREN: Is this better?

21 CHAIR BURMAN: Yes.

22 MS. PEAREN: Great. I think Dr.

1 Burman's comments really reflect the intent of  
2 the subcommittee, so your comments are really  
3 appreciated. Striking that sentence makes sense  
4 since the conversation also indicates that the  
5 report needs to clarify more about the extent to  
6 which enforcement would continue if it was based  
7 on information obtained through other sources,  
8 just to make expectations very clear to  
9 sufficiently convey that piece.

10 CHAIR BURMAN: My thought is -- this  
11 is Commissioner Burman. My thought is that the  
12 question will come is this a way of getting  
13 around enforcement? The report should really  
14 reflect why this is not seen as a way of getting  
15 around enforcement.

16 We're really being offensive in  
17 explaining what the intent is and how it's  
18 separate from enforcement, and it's a tool, but  
19 it's not seen as a get around. I think if we do  
20 that in a way we address the naysayers who are  
21 seeing it as a relaxed enforcement and as a tool  
22 to just avoid getting in trouble. I think that

1 will be helpful.

2 MR. PARKER: I think that will be very  
3 helpful. Holly Pearen is a good drafter, so we  
4 will ask Holly -- she's in our subcommittee.  
5 We'll ask her to help us with that. Is that  
6 agreeable, Holly?

7 MS. PEAREN: Absolutely.

8 MS. BATTAMS: This is Ahuva Battams.  
9 I also just want to remind everybody, as you're  
10 crafting this for the report, our statute doesn't  
11 give us authority over other federal, state,  
12 local, or tribal agencies.

13 If the Committee wants to recommend  
14 something about PHMSA entering into agreements or  
15 having links to the state partners, things like  
16 that, they might want to consider addressing  
17 something like this there. Because just by law,  
18 the pipeline safety statutes aren't going to bind  
19 other federal agencies. Just a legal issue to  
20 consider.

21 MR. PARKER: Ahuva, that's a good  
22 point. I think there's some precedent for the



1 fact that other state and federal agencies can be  
2 bound by the Congress through the commerce  
3 clause, with the intent of regulating pipeline  
4 safety, but there's some ambiguity there, so we  
5 might want to think about how we address it here.

6 MS. BATTAMS: Yes, you want to make  
7 sure that you're clearly articulating, so that  
8 you don't end up in a situation where you're  
9 thinking you're recommending language that then  
10 ends up not being available to you.

11 MR. PARKER: Capable of being enforced  
12 or whatever.

13 MS. BATTAMS: Exactly.

14 MR. PARKER: I think what we'll do is  
15 our subcommittee will invite you into that  
16 discussion.

17 MS. BATTAMS: I'm happy to help.

18 MR. PARKER: Okay, great, thank you.

19 CHAIR BURMAN: I think we have a  
20 comment from the audience.

21 MR. STOODY: I think we definitely  
22 need to describe the intent in the report, but

1 we'll also need the clear rules of what are the  
2 powers of the federal government, under federal  
3 statute? Where are they limited by this program?

4 We have every expectation that there could be  
5 scenarios where PHMSA could, and should, act  
6 through enforcement based on information gathered  
7 in this. The FAA provision provides for that.

8 We'll definitely work with folks in that process  
9 to get what everyone agrees is a reasonable  
10 provision. We wouldn't be able to get anything  
11 through Congress that didn't have that reasonable  
12 balance of wanting to encourage information  
13 sharing, but then not allowing abuse of the  
14 system.

15           Whatever you decide on how to report  
16 -- do the recommendations and how to write that  
17 up, we're definitely committed to finding that  
18 balance in the statutory language that authorizes  
19 this program and would provide for enforcement  
20 discretion, but then also clearly articulate to  
21 operators what is across line, what is within the  
22 line, so everyone has a clear understanding of

1       what are the limits and the powers of this  
2       program.

3                   MR. PARKER: Thank you for that, John  
4       Stoody. John is an excellent drafter of  
5       legislation. I think we might ask him to meet  
6       with the subcommittee, as well, when we get to  
7       that point of the report where we're really  
8       trying to articulate carefully that balance. Any  
9       other questions? Let's move on to Barrier 6.  
10      One of the barriers we identified as a  
11      subcommittee was the fear of litigation, based on  
12      the basis of information that's submitted to the  
13      VIS. Our recommendation is that Congress enact  
14      legislation protecting any information  
15      voluntarily submitted to the VIS from disclosure  
16      in discovery, or admissibility into evidence in  
17      any federal or state litigation.

18                   This particular proposal is supported  
19      by case law. The federal Highway Transportation  
20      and Safety Administration went all the way to the  
21      Supreme Court protecting a similar statutory  
22      provision, and it was deemed totally within

1 Congress's power to limit the use of information  
2 in a voluntary system if that voluntary system  
3 had been determined to be helpful to highway  
4 safety.

5 Same thing in the pipeline industry.  
6 If Congress decides that this prohibition is  
7 proper to encourage participation in the VIS,  
8 then I think it would withstand any kind of  
9 judicial challenge. Any questions, comments,  
10 criticisms? Let's go to No. 7. We thought that  
11 one of the good sources of information for the  
12 VIS would be the results of self-audits. Dan  
13 mentioned this quite a bit, and I agree with  
14 everything he said about that, but operators are  
15 afraid that PHMSA will take enforcement action on  
16 self-audit information voluntarily disclosed to  
17 the VIS. So how do we get around that barrier?

18 We ask Congress, again, to give us a  
19 statute that directs PHMSA to promulgate  
20 regulations that in order to encourage  
21 improvements in safety, anybody who voluntarily  
22 self-audits and submits the information produced

1 to the VIS will receive immunity from enforcement  
2 action and penalties by any federal or state  
3 agency for violations discovered in the  
4 self-audit and disclosed to PHMSA in a  
5 confidential report and corrected within a  
6 reasonable amount of time.

7 This immunity would not apply,  
8 however, if the violation was intentionally  
9 committed. The voluntary self-audit information  
10 would also be privileged and be protected from  
11 release under FOIA and from discovery and  
12 admission into evidence in any federal or state  
13 litigation.

14 The recommendation also encourages  
15 operators to produce and share this information,  
16 furthering the goal of improvements to pipeline  
17 safety. Again, we're trying to tie Congress's  
18 clear intent to encourage participation by saying  
19 that if you self-audit yourself and you make a  
20 good faith attempt to correct it and you notify  
21 PHMSA of what you're doing, you're not going to  
22 be prosecuted for it, or there's not going to be

1 an enforcement action.

2 CHAIR BURMAN: Michelle.

3 MS. THEBERT: I think that's what Alan  
4 just said you're not going to do. It seems like  
5 you're doing an alternative regulation. Alan  
6 said. I don't know.

7 MR. PARKER: Right, that there's a  
8 tension there.

9 MS. THEBERT: Is that right, Alan?

10 MR. MAYBERRY: I'm sorry; what did you  
11 say, Michelle?

12 MS. THEBERT: This sounds like it's a  
13 different way of regulating (coughing) 100  
14 percent immunity right here. I know Georgia  
15 would not ---

16 (Simultaneous speaking.)

17 MR. MAYBERRY: Right.

18 MS. THEBERT: I'm thinking like a  
19 regulator because I am. I'm not trying to  
20 dismiss your recommendation.

21 MR. PARKER: Dan.

22 MR. COTE: Just a global comment.

1 Michelle, I do agree that this does create a  
2 certain tension between a proactive view of  
3 pipeline safety and adherence to regulations.

4 SMS, for example -- and I've talked a  
5 lot about it -- which is, again, a PHMSA  
6 recommended practice, as everyone knows, and some  
7 people perceive to be the future of our industry,  
8 in terms of a more proactive, preventive approach  
9 to risk. One of the key tenets of SMS is ongoing  
10 self-audits to identify weaknesses and holes and  
11 potential regulatory, as well as pipeline safety,  
12 problems.

13 All of that, in my mind, is just great  
14 for the industry to do, as opposed to the  
15 traditional model. If the traditional model of  
16 simple regulation and enforcement worked  
17 perfectly, we wouldn't be in the room, and we  
18 wouldn't need this.

19 This is a step beyond compliance, and  
20 there is going to be a bit of tension. At the  
21 same time, encouraging the industry to do  
22 self-audits, and then act on what those

1 self-audits describe, is intrinsically getting  
2 better. That's one of those philosophical,  
3 40,000-foot strategy questions that either you do  
4 or you don't do. We either encourage it and  
5 believe in it as the future of our industry, or  
6 it's not, and it sort of begs the issue why are  
7 we all here?

8 MS. THEBERT: But if you're an  
9 operator and you haven't had records for the past  
10 five years and you report to the VIS I don't have  
11 records, I'm good, but that means a  
12 performance-based regulation. You have records  
13 this year, but you didn't the past three years.  
14 You're still going to get a violation for those  
15 three years you didn't have.

16 I don't know how -- if you're  
17 self-auditing and you say we don't have all these  
18 records, in my opinion, you could still get some  
19 type of enforcement, whether you found it okay is  
20 not going to be a penalty, and you came forward,  
21 but just saying I don't have it because I didn't  
22 save it, now I'm going to get a pass because I'm



1 going to submit this to VIS, I think that's  
2 really -- I don't know. That doesn't make sense  
3 to me why this Committee would be able to take  
4 all that away if that's what -- if the Congress  
5 does this. I'm just confused on, I guess, what  
6 you're looking for --

7 (Simultaneous Speaking)

8 MR. COTE: I think what this -- I'm  
9 not sure this says what you just described  
10 because that requirement -- let's say it's  
11 leakage survey and you do not have -- you can't  
12 demonstrate that you did leakage surveys for five  
13 years.

14 That doesn't get you a hall pass, per  
15 se, on not having those records, even if you  
16 report it to VIS, because that is a clear  
17 pipeline safety risk. It implies that you didn't  
18 do the leakage surveys. That isn't the intent.  
19 But identifying voids in records for companies  
20 and reporting that to VIS will challenge other  
21 people to do audits, it seems to me.

22 So what this says is that PHMSA will

1 not use -- let's say 5 percent of companies or 10  
2 percent of companies report to VIS that they  
3 don't have all the records they required for the  
4 last five years for leakage surveys. PHMSA  
5 doesn't use that to go hunt down those companies  
6 and find the data.

7 MS. THEBERT: Because then you didn't  
8 do it. If you don't have the records, you didn't  
9 do it. Now you're saying I don't have the  
10 records; I know I don't have them. I'm going to  
11 get --

12 MR. COTE: I think the distinction  
13 that you did not recognize in your statement,  
14 Michelle, if I may, is the use of it. If PHMSA's  
15 out doing audits every day and they find from  
16 2013 to 2018, you don't have leak data on  
17 mandated surveys, then your having reported it  
18 three months ago to VIS does not get you a hall  
19 pass on it.

20 Maybe, as an operator, you say we  
21 identified it. You're right. We did an audit  
22 three months ago; we found it. We're working on

1 fixing it. But if you don't have data that  
2 you're required to have under 192, that doesn't  
3 get you a hall pass. I think that's the  
4 distinction.

5 MS. THEBERT: But they're under audit  
6 already, and that's discovered by the inspectors,  
7 and they're just like -- I just feel a conflict.  
8 We're in the process of doing a VIS report, so  
9 you can't get on us this. I feel there's an  
10 incident related to a leak survey that wasn't  
11 done, I think there's a huge liability for states  
12 and for PHMSA. All they did was report to this  
13 group. We didn't do any enforcement on it.  
14 That's one of the things I see with that.

15 MR. COTE: Again, you and I read it  
16 differently. Let's refer back to -- Randy, was  
17 my description of that correct, in terms of using  
18 the VIS data as the key?

19 MR. PARKER: Right, that was the key  
20 is that if we want to funnel this information  
21 into the VIS, so that it helps improve pipeline  
22 safety for the whole community, a self-audit

1 that's submitted that way should not be subject  
2 to enforcement action, unless it was intentional.  
3 There's a carve-out there. If you intentionally  
4 did that --

5 MS. THEBERT: But how is that  
6 determined?

7 MR. PARKER: It would be determined in  
8 an enforcement action as we think this was  
9 intentional.

10 CHAIR BURMAN: We'll come back. I  
11 think people may information or thoughts to add  
12 to this. Alan, then Mark, then me, and then  
13 we'll open it back up and Michelle and you may  
14 have thoughts on it. Alan.

15 MR. MAYBERRY: I'm just struggling  
16 with this a bit because it just -- aren't we here  
17 about sharing -- let me think of an example for  
18 distribution related to assessment information,  
19 something related to taking corrosion readings  
20 and correcting shorts or correcting -- shorted  
21 casings. That could apply to both.

22 Let's say deficient corrosion

1 readings, lessons learned related to that,  
2 because that can be a challenge, or the ability  
3 to detect hook cracks, an improved way to do that  
4 for the transmission guys.

5 I feel like if we're going to have a  
6 conversation about this, we have a conversation  
7 about this in that realm, but it's a different  
8 realm than sharing information, not that it  
9 couldn't be expanded to this, but I guess my  
10 thinking going into this is it's not so much  
11 about which -- SMS is a lot about self-audits and  
12 correcting deficiencies, and that's a good thing.  
13 In that realm, we are training our staff to see  
14 that, as operators implement SMS, that if you  
15 find bad stuff, that's a good thing. I see this  
16 as a bit different, though.

17 MR. COTE: Dan Cote, if I can respond.  
18 Let's use your corrosion one. In my mind, it's a  
19 very good one. Let's say I'm an operator. For  
20 whatever reason -- every year, as we do readings,  
21 as you know, on mains, we find deficiencies.

22 Typically, you have until the next

1 regularly scheduled inspection to remediate  
2 those. Let's say 5 percent of mine, whatever  
3 reason, bad weather, could be 100 things, we  
4 didn't get to.

5 We found that by missing our annual  
6 deadline by 18 months, we were seeing some  
7 corrosion on the facility, which became a bright  
8 line to the rest of the industry, saying you know  
9 what, instead of using that -- because a lot of  
10 operators -- I happen to know that for a fact,  
11 sad to say -- use that entire 12-month period,  
12 and sometimes up to 15, if it's the next -- and  
13 you know the language of code.

14 Compliant, but is that necessarily  
15 safe? Saying to the industry you know what,  
16 waiting that long isn't smart. The reality is if  
17 you're focused on pipeline safety, corrosion  
18 starts taking place after six months, you really  
19 want to jump on this stuff. That is valuable to  
20 the industry, in my mind. To Randy's expression,  
21 you have made a contribution to the knowledge of  
22 the community. PHMSA wouldn't use that, saying

1 we have some operators out there that reported to  
2 VIS, that said that they weren't getting their  
3 inspections done.

4           Inspectors, go find them. That would  
5 be a bit of a breach. I do agree with your  
6 initial hypothesis, though. This area, we need  
7 to spend more time on outlining what that really  
8 means, in terms of content, in a way that there's  
9 more global consensus on it.

10           MR. MAYBERRY: My concern is with  
11 diluting the value of what we're trying to  
12 accomplish. If we crack the door open on that in  
13 this realm, it becomes a system for -- to hide --  
14 I'm saying it very negatively -- to hide behind.

15           MR. COTE: I don't think any of us,  
16 just to reassure you --

17           MR. MAYBERRY: That's not the intent.

18           MR. COTE: -- we are not trying to  
19 find -- we are not trying to create a haven for  
20 bad actors.

21           MR. MAYBERRY: Most operators aren't.

22           MR. COTE: In all of our discussions,

1 that has been absolutely clear. The question is  
2 how do we craft that in a way that sort of  
3 balances the frame? Agreed.

4 MR. HERETH: I'm Mark Hereth, with the  
5 Blacksmith Group. Help me understand how this  
6 would fit within the scope of our mission.

7 CHAIR BURMAN: Before you answer that,  
8 can I just offer my thoughts on this? I think  
9 what I'm hearing is that there's a need to make  
10 sure that with this program, there is sufficient  
11 data that is being gathered that can be given for  
12 that review, and the focus is on allowing a --  
13 whether we call it data sharing, voluntary  
14 self-audits -- that are utilized, really, solely  
15 for the purpose of helping with the VIS, so to  
16 the extent that you do whatever your processes  
17 are, not as okay, great, I'm going to do  
18 self-audits to get around it, and then if I'm  
19 find something, I'm going to share it with VIS.

20 The voluntary self-audit is being  
21 done, potentially with certain people that are in  
22 that same realm of confidentiality and other



1 things, but it's a system process that is being  
2 utilized for the purpose of that data gathering.  
3 That information that is being utilized in that  
4 self-audit, really solely for the voluntary  
5 information sharing, isn't utilized as a gotcha,  
6 so that the people in the room who come together  
7 to share aren't now saying since I gave it, and  
8 since I know the specific information, I have to  
9 give it over for enforcement mechanisms or  
10 others.

11 They're trying to establish the  
12 mechanism to be able to say I did the self-audit  
13 for the purposes of VIS and now don't have a  
14 gotcha on me. Is that kind of --

15 (Simultaneous speaking.)

16 CHAIR BURMAN: Rather than we're going  
17 to do a self-audit, and if we turn over any of  
18 our information to VIS, you can't go after us.  
19 That's the distinction I see is needing to get  
20 back to the purposes of collecting. Whatever  
21 that data collection is, you don't want to chill  
22 people's ability to give that information. I'm

1       sorry.

2                   MR. HERETH: That captures a part of  
3 the concern that I had. I just don't think that  
4 we want to -- I don't think -- I hope that your  
5 intention is not to extend the scope of what  
6 we're doing within VIS to cover audits of SMS  
7 systems. That's the way I read it.

8                   MR. MAYBERRY: That's what I'm trying  
9 to articulate, too. I think it's a relevant  
10 discussion in a separate area --

11                   (Simultaneous Speaking)

12                   MR. HERETH: You could even extend it  
13 to a discussion about credits. There's other  
14 areas where you could go with that.

15                   CHAIR BURMAN: In a sense, you want to  
16 give the tools for the ability for people to have  
17 specific information or to collect specific  
18 information and to share, so that you're  
19 encouraging that be aware and share, whatever  
20 that mechanism is, and that will be the tools of  
21 the program that get worked out and fleshed out,  
22 in terms of what that is.

1                   Again, going back to the FAA model,  
2                   that's some of the things that they had to work  
3                   out in how do we gather it, what are the right  
4                   people to be a part of it, how do we our  
5                   self-assessments and our self-audits outside of  
6                   the enforcement, and yet, not being, now, in the  
7                   since I have the information, I have to turn it  
8                   over to the enforcement folks, because otherwise,  
9                   I'm in trouble, which gets to, I think,  
10                  Michelle's concern about if you have that  
11                  information, you're supposed to do something with  
12                  it outside of VIS.

13                  MR. PARKER: It definitely merits  
14                  further investigation and discussion. Mark, did  
15                  you have a comment? Kate?

16                  MS. BLYSTONE: Kate Blystone, Pipeline  
17                  Safety Trust. I think this goes back to Dr.  
18                  Murray's comment about phasing. I wonder if this  
19                  language could be softened to say that this is a  
20                  consideration, instead of saying Congress should  
21                  enact. I don't know. It just feels like it  
22                  should be softened because I don't think this is

1 necessary for the functioning of a voluntary  
2 information sharing system, just personally.

3 I feel like this is a bit additive.  
4 That said, we could walk out with Phase 1 and  
5 have this included. I just want more discussion  
6 on that, and perhaps it's part of the phasing  
7 process that this becomes something that we add  
8 if we can't get participation.

9 MR. PARKER: That's very possible.  
10 Another option would be, maybe, that the VIS, as  
11 it matures, may want to say we want all the  
12 operators to self-audit this area. Go out there  
13 and do a self-audit on this particular scope of  
14 thing and bring us that information. Then there  
15 could be some protection for that, where it's  
16 generated by the system, itself, not presumed up  
17 front as a separate thing.

18 CHAIR BURMAN: Alan.

19 MR. MAYBERRY: This is Alan, again.  
20 Just want to make sure -- I think I understand  
21 the concern. I've seen it work both ways, where  
22 an operator may come forward with a

1 self-disclosure in our region or we worked with  
2 them closely and there wasn't any punitive  
3 action.

4 But then I've also seen it the other  
5 way, where they kind of wish they had not brought  
6 it up, too. So I can see the desire to have a  
7 mechanism that really is fully within the tenets  
8 of SMS to have that.

9 MR. PARKER: SMS is what we're talking  
10 about here, so it's worth further discussion, but  
11 we don't want to inadvertently blur the lines on  
12 what the VIS is all about. Mark.

13 MR. HERETH: Mark Hereth, with  
14 Blacksmith Group. I guess the only point of  
15 clarification I would see relates to the Chair's  
16 comment, which is does this relate to VIS, or  
17 does it relate more broadly to the use of  
18 self-audits in a broader SMS program?

19 MR. PARKER: Our conception was that  
20 it was related only to VIS use.

21 MR. HERETH: Okay, thank you.

22 MR. PARKER: Our subcommittee looks at

1 VIS as an element of SMS, really.

2 CHAIR BURMAN: Mike.

3 MR. LAMONT: Randy, did you look at  
4 the State of Texas's Audit Privilege program?  
5 They require that you make notification of  
6 self-audit prior to initiating the audit because  
7 you don't get immunity for penalty just going we  
8 did a self-audit, here's what we found. You have  
9 to make notification prior to the audit, say this  
10 is what we're auditing, those specific things,  
11 and then you disclose what you found.

12 MR. PARKER: This is based on the  
13 Texas statute.

14 MR. LAMONT: Just to point out -- I  
15 think Mark has a very good point. As it relates  
16 to VIS -- if we're starting to include a  
17 third-party integrity management program review,  
18 that's required under code. We're not doing  
19 these add-ons for other pipeline safety programs.  
20 This is specific for VIS, correct?

21 MR. PARKER: Correct.

22 CHAIR BURMAN: To the extent that I

1 think this is really very important, though, and  
2 so that we're extracting from here the necessary  
3 information to be useful in the program and that  
4 we're trying to open up what that means, so that  
5 people are willing to share, and to the extent  
6 that incorporating SMS as part of it, I think, is  
7 really key.

8 I think we need to keep in mind the  
9 high-level intent and what some of the tools are  
10 that we're going to need to, again, have drilled  
11 down, whether it's in the statute or in the  
12 program, itself, and allowing the flexibility for  
13 inclusion into the VIS system voluntary  
14 self-audits as it relates with SMS, I think, is  
15 really key.

16 Some of those things, in terms of what  
17 would fall in it, how is it determined will be  
18 helpful. The other thing I think that we need to  
19 also keep in mind is this report is a report to  
20 the secretary. When we do the full report, and  
21 when we look at this, we also have to keep in  
22 mind that while there are certain things that we

1 identify that are going to be needed for  
2 legislation and/or regulation, the misstep that I  
3 don't want to have is that we aren't giving her a  
4 report that, then, she can determine from this  
5 she wants to ask Congress for. Because here, all  
6 that we've done is made recommendations, but  
7 we're making recommendations to her for, then,  
8 the next step. I think we need to focus on that.

9 MR. PARKER: That's exactly how we see  
10 it in our subcommittee. This definitely needs  
11 additional work, which we will do. Michelle.

12 MS. THEBERT: I'm not trying to  
13 belabor the whole distribution versus  
14 transmission, but I know at least in Georgia, we  
15 have some operators with less than 100 services.  
16 We have maybe seven who can actually afford to do  
17 a self-audit.

18 That's where I'm concerned about any  
19 kind of discrimination later on. If you can  
20 self-audit and report yourself, you're okay. If  
21 you're not able to because of financial  
22 restrictions -- because they can do auditing for



1 real, they would never have the resources to do a  
2 self-audit. They wouldn't even qualify for this  
3 kind of stuff. I don't know if that's -- if we  
4 should limit the number of customers on the  
5 distribution side, or if they're all in --  
6 because the ones I know of, most of them are --  
7 we have maybe 10 or 12 who are big enough to do  
8 any of this kind of stuff.

9 I don't know if that's -- I know we're  
10 past that already in this discussion. I'm just  
11 throwing it out because that would be a concern,  
12 at least with states who have smaller municipals,  
13 for whatever it's worth.

14 MR. PARKER: Thank you, Michelle.

15 CHAIR BURMAN: Dan.

16 MR. COTE: Dan Cote. Just to respond  
17 to what you said, Madam Chairman, I really agree,  
18 and I want to reinforce that a bit. First of  
19 all, there has been discussion -- and this is  
20 sort of fascinates me. I won't rant; I promise.

21 There has been discussion of VIS  
22 reporting as though there were a clearly defined

1 standard in place today and a flow of reports  
2 through a system that doesn't exist yet, so none  
3 of that exists. Where this started was a  
4 statutory obligation to essentially share ILI  
5 data. That's where we started. For all the  
6 right reasons, in my mind, we expanded that  
7 dramatically to a much larger universe, to  
8 encompass more of the universe's pipeline safety,  
9 for all the right reasons.

10 So now, we're well outside of any of  
11 that. Really, in my mind, what constitutes  
12 appropriate VIS reporting hasn't been defined  
13 yet. We can make that scope as large or as small  
14 as we want it to be to fall under VIS.

15 But I remind everyone that the more  
16 data that we get through on what operators are  
17 finding that constitute both benefits and  
18 opportunities to improve, as well as risks,  
19 benefits us all enormously. In order to get  
20 people to report, we've got to think about the  
21 tension around all the existing mechanisms now.

22 For myself, I'll just swing for the

1 walls and say I don't much care whether it came  
2 through an SMS audit, a transmission integrity  
3 audit, a DIMP (phonetic) audit in review of data.  
4 Findings that constitute either opportunities or  
5 risks are beneficial for the industry to  
6 understand because if one of us has them, many of  
7 us are likely to. All of that is good data. I  
8 would just encourage everyone to recognize those  
9 opportunities for our industry and to scale that  
10 against -- Alan, I understood your concerns  
11 fully, and this is not about hall passes, but  
12 there is a bit of tension. Really do like the  
13 idea of our weighing that carefully in a  
14 different form.

15 MR. PARKER: Thank you, Dan, that's  
16 very good.

17 MS. PEAREN: Commissioner Burman, this  
18 is Holly Pearen, with EDS, on the phone.

19 CHAIR BURMAN: Great.

20 MS. PEAREN: After listening to the  
21 discussion, it occurred to me that perhaps this  
22 recommendation regarding collecting information

1 from voluntary self-audits might be better  
2 articulated by Process Sharing or Data Management  
3 Subcommittees, rather than specifically called  
4 out in the Regulatory, Legal and Funding as a  
5 specific enforcement provision.

6 That way, any information submitted to  
7 the VIS would be covered by the general  
8 confidentiality and enforcement provisions,  
9 regardless of the type of information or where it  
10 was gathered from. Then Process Sharing or other  
11 subcommittees could articulate the very important  
12 role voluntary self-audits play in providing that  
13 essential information for risk analysis to the  
14 VIS.

15 MR. PARKER: Holly, I think that's a  
16 good idea. We probably should wrestle with this  
17 in the other subcommittees before we try to find  
18 a legislative solution to the protection because  
19 we're not far enough along in our thinking. I  
20 think that's a great idea. Okay, which committee  
21 wants to take on this challenge?

22 (Simultaneous Speaking.)

1 CHAIR BURMAN: I think both Process  
2 Sharing and Best Practices can work together on  
3 that.

4 PARTICIPANT: Best Practices is --  
5 (Simultaneous Speaking)

6 CHAIR BURMAN: With, then, the  
7 backstop being that Regulatory and Legal comes in  
8 to identify what is necessary to extract with  
9 that.

10 MR. PARKER: Right, whatever they come  
11 up with a recommended approach, then we could  
12 supply whatever we think is recommended legal  
13 backdrop.

14 PARTICIPANT: You have a comment from  
15 back in the public.

16 MR. TU: Wen Tu, AGIA. After hearing  
17 this discussion, I did have one question that I  
18 had for the Committee, overall, which is that  
19 there's a distinction between data and  
20 information.

21 My question is, is the intent of VIS  
22 to collect that data from operators who

1 voluntarily deliver that data, and then to do the  
2 analysis to get that information within the  
3 system, which we're calling VIS today, or is it  
4 for the operators to provide the information in a  
5 consolidated database to be shared amongst -- so  
6 the distinction is are we doing analysis within  
7 the system, or are we allowing the operators to  
8 do it and providing just the information?

9 MR. PARKER: Dan.

10 MR. COTE: I think the way we  
11 envisioned this, 90 percent is operators are  
12 providing data that the third-party vendor turns  
13 into macro information. Obviously, a single data  
14 point -- it becomes very hard, in a single data  
15 point, to make it anonymous. At that point, it  
16 isn't even necessarily information. Again, it's  
17 a single data point. Again, I never say never.  
18 Some sorts of occurrences and findings may be so  
19 compelling, with a single data point, that we all  
20 need to hear it immediately, but that would be  
21 the exception, rather than the rule, just by way  
22 of high-level vision, the way I see that.

1                   MR. PARKER: Mark, that falls right  
2 into your area.

3                   MR. HERETH: I'm Mark Hereth, with  
4 Blacksmith Group. I agree with what you're  
5 saying, Dan. I think I would refer you back to  
6 the slide in our subcommittee presentation, where  
7 we talked about the types of sharing.

8                   It includes data, but I think it also  
9 includes information that we learn from  
10 incidents, information that we learn from the  
11 application of assessment technology, so it's  
12 both. I think it's both. That's something we've  
13 had as a theme probably from the first or second  
14 meeting.

15                   MR. PARKER: By the way, Mark, I liked  
16 that slide a lot. That really helps, in terms of  
17 people are always asking me what are you guys  
18 doing? What information are you sharing? That's  
19 a good way to distill it.

20                   MS. HICKS: Randy, could you speak up  
21 a little? We couldn't hear you over --

22                   MR. PARKER: Yes, I'm sorry. I was

1 just saying that I like the slide that Mark's  
2 referring to, that we saw earlier today, because  
3 it's a good way to impart to others, outside our  
4 Committee, what types of information we're  
5 talking about sharing. Let's move on.

6 Barrier No. 8. Near miss information  
7 is extremely important, but there's a real fear,  
8 a palpable fear among operators that near miss  
9 information could lead to enforcement and  
10 penalties by PHMSA or other federal and state  
11 agencies. I think everyone understands that.

12 If you've ever been in a meeting when  
13 someone says we had a near miss, what happened,  
14 and everybody gasps for air, like oh, my God, we  
15 were so close to having a really catastrophic  
16 accident. One little element prevented it. Most  
17 of that information is kept inside each operator.  
18 It doesn't get communicated because of the fear  
19 of what might happen. We came up with this  
20 recommendation that Congress should enact  
21 legislation providing that a pipeline operator  
22 that voluntarily submits to the VIS near misses



1 will receive immunity from prosecution and  
2 enforcement related to the near miss information  
3 that's disclosed to PHMSA in a confidential  
4 report and corrected within a reasonable amount  
5 of time.

6 In other words, if it's a near miss  
7 that requires something to be done, you commit to  
8 doing it, but you also give a confidential report  
9 to PHMSA that you're going to do it, and that  
10 near miss information is part of the VIS that  
11 can't be used against you in an enforcement  
12 action.

13 However, there are exceptions. The  
14 second paragraph is the exceptions to the  
15 immunity. Those are really tracked through the  
16 FAA carve-outs of the five deadly sins.

17 If it's an intentional violation or an  
18 employee's action or failure to act that was  
19 intended to damage the facilities or injure other  
20 employees or purposely place the public in  
21 danger, or if the near miss, itself, was caused  
22 by prohibited use of alcohol or drugs, or if the

1 near miss report contained knowingly falsified  
2 information. Near miss events eligible for  
3 immunity under this act are protected from,  
4 again, disclosure, release under FOIA, and from  
5 discovery or admissibility into evidence.

6 The idea here is to create a safe  
7 harbor for companies that normally would never  
8 report this near miss information, to give them  
9 the assurance that they won't be -- won't face  
10 consequences in enforcement action, but has the  
11 added feature that PHMSA gets to learn about this  
12 and the VIS gets to process the information and  
13 publicize it as it feels necessary, for instance,  
14 in a safety bulletin, if it's something that's  
15 urgent, or in whatever manner that the VIS system  
16 manages these kinds of data points.

17 CHAIR BURMAN: Walter, and then Alan.

18 MR. PARKER: Questions, comments?

19 MR. JONES: I have a few questions.

20 I was sitting here, I was wondering if -- because  
21 your pretty extensive recommendations on  
22 anonymity and protection from retaliation and

1 enforcement. Did the committee consider  
2 extending any of those protections to workers and  
3 employees in any of your recommendations? Then  
4 when I do one, it's actually removed protection  
5 from an employee's action. I would suggest that  
6 you look at an option of extending the same  
7 amounts of anonymity you want to many of your  
8 contractors to these employees, so they will  
9 report these near misses and not face retaliatory  
10 actions as a result of reporting them.

11 Then I want to also comment on your  
12 use of drug and alcohol language in there to  
13 point out that most states allow workers to use  
14 medicinal marijuana and other drugs.

15 As we all know, you can smoke on joint  
16 on Thursday, not be high on Monday, be involved  
17 in an incident and be drug tested, and now that  
18 incident is related to you being high on the  
19 blood that's in your system on Thursday, so  
20 you're not even really going to address the  
21 situation.

22 You're just going to pawn it off on

1 some employee that was high, when they really  
2 wasn't. Our drug tests are unable to test for  
3 impairment, like we can do with alcohol. I would  
4 just throw some of this back at the committee to  
5 really look at again. I would still encourage  
6 you guys to -- if you really want workers to  
7 report a lot of these issues that you're looking  
8 to receive immunity and a lack of retaliation and  
9 enforcement, you should probably look to probably  
10 extend that to some of your workers, and then  
11 also drill down on these drug and alcohol issues.

12 MR. PARKER: Walter, those are good  
13 points. As a matter of fact, we intended to  
14 include, in the language of the first part, the  
15 protection to employees, specifically. I don't  
16 know why it didn't end up in this draft, but it  
17 was in there before because we specifically  
18 modeled it after the FAA's protections.

19 It extends to everybody on the tarmac,  
20 including manufacturers and employees of  
21 manufacturers. That was a mistake on our part.  
22 I don't know enough about the alcohol and other

1 drug prohibitions to really comment much on that,  
2 so we'll have to study that some more.

3 MR. JONES: The rules three years ago  
4 -- now in Rhode Island and other places, if  
5 you're tested for a metabolite for marijuana and  
6 you produce a medical marijuana card, so your  
7 doctor can show your metabolites -- I think it  
8 was Rhode Island or somewhere in New England, you  
9 could get your job back because you're complying  
10 with the rules. These things are really fluid  
11 right now. I don't know which direction we're  
12 going. Everything seems to be dependent on  
13 safety sensitive, but in our industries,  
14 everything is safety sensitive, every position,  
15 even a janitor.

16 That type of broad blanket coverage is  
17 even now being questioned, this idea of safety  
18 sensitive jobs. I just throw that out there that  
19 there's a fluid moving target these days that  
20 maybe we don't need to really jump into, at this  
21 point.

22 MR. PARKER: That may be the case.

1 Those are good points. By the way, the Federal  
2 Railroad Administration also has kind of an  
3 exemption like that. They cover employees, but  
4 then they have --

5 (Simultaneous Speaking)

6 MR. JONES: Everyone does because your  
7 insurance is basically driving that, requiring  
8 test everybody after every accident. I'm walking  
9 down on a work site and a brick hits me on the  
10 head, I had nothing to do with that, but now I've  
11 got to go get tested. Now maybe I don't want to  
12 report the incident because of my activities a  
13 month ago. It's a burgeoning issues. I don't  
14 know that we need to really get into it. There  
15 were a bunch of recommendations we made. I don't  
16 know that this is one we need to be dying on the  
17 stake over.

18 MR. PARKER: I'll say this. I don't  
19 know about the exemptions, but as far as the near  
20 miss information, itself, it's extremely  
21 valuable. Right now --

22 MR. JONES: (Simultaneous Speaking)

1 don't get reported, though.

2 MR. PARKER: Right now, it's not  
3 getting reported to anyone, so we've got to  
4 figure out a way to get that into the VIS, so  
5 that people can take advantage of it. Mark.

6 MR. HERETH: This is Mark Hereth. I  
7 commend you for including near misses, and I  
8 think you should keep working on this language  
9 because I think another place where you'll find  
10 protections like this is in OSHA, in process  
11 safety management. This is a great place to be  
12 going, so thank you.

13 CHAIR BURMAN: Alan, then Sherry, and  
14 then it sounds like Holly wants to talk, too.

15 MR. MAYBERRY: Alan Mayberry, to that  
16 end, actually, OSHA probably already defines it,  
17 but just from experience, I know defining close  
18 calls will be probably the funnest part of this  
19 type of change. You may have covered that  
20 previously, but did you guys talk about what  
21 constitutes a close call?

22 MR. PARKER: No, we haven't talked

1 about that today, but you can go ahead and  
2 explain it.

3 MR. MAYBERRY: That ultimately would  
4 be defined -- we're not here to implement this or  
5 design it, but that will be something to  
6 consider. If there are any words related to what  
7 constitutes a close call, put some boundaries  
8 around it.

9 MR. PARKER: The Federal Railroad  
10 Administration does have a close call system.  
11 It's voluntary. That has been very valuable,  
12 I've heard, in terms of what they're able to do  
13 about analyzing why these close calls happen.

14 CHAIR BURMAN: Sherry.

15 DR. BORENER: Sherry Borener, from  
16 PHMSA. I think this goes back to the earlier  
17 question that we had, and Christie's point. Just  
18 from experience, it's very hard to construct  
19 voluntary reporting systems, like ASAP, the  
20 Aviation Safety Action Program, where carriers  
21 can report near miss information, voluntary  
22 disclosure programs, where they can report a



1 problem and enter into an investigative process  
2 with the agency and get indemnified from  
3 investigation. That doesn't mean that they don't  
4 report.

5           These things are very elaborate  
6 programs. If these things are essential to  
7 getting VIS, then I think we should talk about  
8 them. If they're not essential at the moment, if  
9 it doesn't close the door if this doesn't exist,  
10 then could we find a way to address the variety  
11 of issues that might come up because you were a  
12 participant in VIS as an ongoing process in the  
13 development of the governance of the system, so  
14 that it's not -- so that this doesn't become the  
15 thing that keeps you from getting started?

16           I just want to say, again, it took ten  
17 years for FAA to get to the point where they had  
18 a structure, and maybe it will take three years  
19 for Singapore, but if you try to do everything at  
20 the same time, it is really going to be daunting.  
21 Maybe the most important thing is some basic  
22 information that will move the ball forward.

1                   MR. PARKER: Thank you for your  
2                   comments.

3                   CHAIR BURMAN: We have Holly, and then  
4                   we have the audience, but I also do want to say  
5                   that near misses and that information seems like  
6                   it is very relevant and very important to be part  
7                   of it. I do think that goes into when best  
8                   practice and process sharing is looking at the  
9                   information.

10                   It's important to identify that the  
11                   collection of that information is important,  
12                   which is why it also needs to be protected and  
13                   confidential and all of the different sort of  
14                   same issues. Then to the extent that regulatory  
15                   and legal identifies that there needs to be a  
16                   mechanism to allow that and to have protections  
17                   in place, I think, is important.

18                   That, I think, gets to very similar  
19                   things, so it may be taking a lot of these and  
20                   putting them together, but the process sharing  
21                   and best practices can help to flesh out the  
22                   rationale, if that makes sense.

1           MR. PARKER: That does make sense. It  
2 makes a lot of sense, just as we did in the  
3 previous one.

4           CHAIR BURMAN: Holly.

5           MS. PEAREN: Thank you, Commissioner  
6 Burman, Holly Pearen, Environmental Defense Fund.  
7 I wanted to address Walter's concern about the --  
8 related to the suite of things listed. It's our  
9 understanding that PHMSA has authority to -- or  
10 discretion over enforcement in certain cases, but  
11 no statutory discretion over enforcement in  
12 certain cases.

13           Those are spelled out in statute, just  
14 like they are for the FAA and Railroad. We  
15 understand that since it doesn't have  
16 discretionary enforcement authority over things  
17 like intentionally committed acts and acts in  
18 which there was a drug or under the influence  
19 indication, if that turns out not to be the case,  
20 we can certainly amend it, but the list of  
21 instances that you see on the slide really is  
22 based in the discretionary enforcement authority

1 of PHMSA versus the non-discretionary enforcement  
2 authority.

3 MR. PARKER: Thank you, Holly. I  
4 recall those discussions. You're right. I might  
5 add, in one response to that, at the bottom of  
6 that paragraph it says language to be refined.  
7 Yesterday, we gave a task to Dane Jaques, who's  
8 an external member. He's a lawyer, former pilot.  
9 He's been through all of the FAA programs. He's  
10 going to pull together a memo for us on that  
11 immunity, where it doesn't apply to employees and  
12 exemptions/exceptions for all the different  
13 programs at FAA.

14 Then he's going to discuss that with  
15 Cyndi Dominik, who's a lawyer at FAA who's also  
16 aware of all those programs, of course, and then  
17 report to our subcommittee on what we think would  
18 be appropriate -- if we have a near miss  
19 statutory authorization, what would be  
20 appropriate to exempt and how you would do it in  
21 a PHMSA context. We'll have more homework to do  
22 for you on that. I think that will help, Walter.

1 We will probably pull you into that, too.

2 MR. JONES: Sure. I'm around.

3 MR. PARKER: Go ahead.

4 CHAIR BURMAN: No, I'm good. I think  
5 we have audience, and then we have --

6 MR. PARKER: John.

7 MR. MACNEILL: John MacNeill, the  
8 Utility Workers Union. On the near miss programs  
9 and close call programs, any of these programs  
10 that we get involved with with any of our  
11 employers, we go into an MOU. There's language  
12 built in there, on these programs, that these  
13 programs -- it's a no name, no blame program,  
14 where the employee making the report doesn't have  
15 to give his name, but he could if he feels like  
16 he wants to, but there is no blame attached to  
17 these programs.

18 I think the way you're writing this up  
19 here, it would take away from the MOUs that we  
20 have in place with our employers. It contradicts  
21 that. That's something that we already have in  
22 place.

1                   MR. PARKER: That's really good to  
2 know. I know that for the Federal Railroad  
3 Administration, it's not actually a voluntary  
4 program. It's mandatory, I think, the reporting,  
5 but not the -- if an employee does it, it's under  
6 an MOU, right?

7                   MR. MACNEILL: In the utility  
8 industry, what we do is we -- in our collective  
9 bargaining agreements, when we get into these  
10 close call programs and near miss programs, we  
11 stress that this is a no blame program. If  
12 somebody puts in a close call, there is no  
13 retaliation attached to -- there's no period that  
14 gets attached to that.

15                  MR. PARKER: Thank you, John. We'll  
16 pull you into this group, too, in discussing how  
17 we might want to look at -- the options for  
18 looking at this. That would be an elegant  
19 solution.

20                  MR. MACNEILL: It's something we deal  
21 with all the time, anyway. It does stop people  
22 from being involved in reporting if they feel

1 that there's a possibility they're going to be  
2 punitively disciplined attached to that. It is  
3 something that can prevent people from reporting.

4 MR. PARKER: That's interesting. I  
5 think we'll have to make a distinction, as we  
6 work on this, between the operator versus the  
7 employees because they have very different needs  
8 they want to protect.

9 CHAIR BURMAN: Eric, and then Walter.

10 MR. AMUNDSEN: Eric Amundsen, Energy  
11 Transfer. The only thing I would offer the  
12 Committee is that in my experience and our  
13 company's experience, some of the highest value  
14 learnings out there come from near misses. I  
15 think it's really -- and Mark touched on this --  
16 it's really worthy of our best efforts to get  
17 this part right because I think if we don't, and  
18 we don't have provisions in place to mitigate the  
19 barrier that obviously exists, we're really going  
20 to lose out on some of the very highest learnings  
21 in the industry. Our presentation from yesterday  
22 on COS, I think they have a way of classifying

1 and tiering those kinds of events.

2           They had HVLEs. We use the same terms  
3 in our company. So again, I think there's ways  
4 to classify and prioritize those types of -- and  
5 the value associated with those learnings.

6 Again, I think we've got to get this part right.  
7 It's relatively low fruit because it's out there.

8           These things happen. We keep them to  
9 ourselves because of the kinds of issues we're  
10 talking about here. I think the reality is it's  
11 a source of extremely high value of learning and  
12 improvement.

13           DR. BORENER: Can I just ask a  
14 question there? Sherry Borener, from PHMSA. You  
15 have an internal voluntary reporting program at  
16 your organization?

17           MR. AMUNDSEN: Yes.

18           DR. BORENER: This statute's not going  
19 to -- I don't think could protect an employee who  
20 reports from having their company respond to  
21 them. It only has to do with the government.  
22 That's what I was trying to get at is there's a



1 whole structure -- what ASIAs is taking advantage  
2 of is that companies have voluntary reporting  
3 programs.

4           They get the data, and then they share  
5 that data as part of their involvement with -- so  
6 the protection between the employee and the  
7 operator is not part of the VIS. That's a  
8 different structure that we would have to build  
9 in order to make that happen.

10           MR. PARKER: Dan.

11           MR. COTE: Dan Cote. She has a point.  
12 That's exactly right for many companies. We  
13 happen to have a voluntary reporting program  
14 that's really robust. The question that we're --  
15 we see the data, and we analyze it.

16           To your point, it can either be  
17 anonymous, or if someone chooses to can sign it,  
18 but it's essentially no fault. The question is  
19 -- what is not happening today is we're not  
20 sharing any of those findings with the industry.  
21 That's the piece that Eric is really referring  
22 to, in terms of we're missing the boat. Eric, I

1 agree with your analysis fully. These will be  
2 among the most valuable learnings we could be  
3 sharing because of the very nature of the near  
4 miss. Couldn't agree with you more.

5 MR. PARKER: My context was energy  
6 transfer sharing with the rest of the industry.

7 DR. BORENER: All of industry --

8 MR. AMUNDSEN: But your point's well  
9 taken.

10 DR. BORENER: All of industry might  
11 not be under a program like that, so smaller  
12 operators might not have anything like that. We  
13 would need to do something so that everybody in  
14 the industry could participate. That's a  
15 project. That's something that we might do as  
16 part of the development of the program.

17 CHAIR BURMAN: Walter, did you -- you  
18 had your hand up.

19 MR. JONES: No, I'm fine, thanks.

20 CHAIR BURMAN: Anybody else at the  
21 table? On the phone? In the audience?

22 MR. PARKER: Okay, Madam Chair, we

1 have completed our eight recommendations and  
2 given ourselves a long list of homework items.

3 CHAIR BURMAN: It sounded like you  
4 also gave best practices and process sharing  
5 homework, so that's good. I do want to do a time  
6 check. We still have four more reports to go  
7 through. The way I've re-established on the  
8 agenda is we're going to best practices now, and  
9 then we're going to end for lunch, which means  
10 that you have a shorter -- not an hour and a half  
11 lunch, but just an hour lunch.

12 For those of you who are ordering in,  
13 you should be cognizant of that. For those of  
14 you who are not, it would be helpful to have a  
15 carpool or something, so that others can go. The  
16 Madison Deli around the corner is easy and quick.  
17 We went there yesterday, and it was fine.

18 Then at 1:30, when we come back, we  
19 are going to do our presentations, but then we're  
20 going to, at the break, just take a ten-minute  
21 break, and then start at 3:40. We will do the  
22 training and qualifications report out, and then

1 we will do the technology report out, which leads  
2 into the discussion on IT architecture.

3 That's on Agenda 4. Then Agenda 5,  
4 which is the Committee prep discussion leading  
5 into the next steps, we'll have the Reporting  
6 Committee report out, which I think will be a  
7 nice segue into where are we going from next  
8 steps. We will end, if not before 5:00, at 5:00.  
9 Does that make sense for anyone?

10 MR. WARNER: Madam Chair, Chris  
11 Warner. I have to leave at 4:00 to catch a  
12 flight, so we can swap the R&D and the other one?  
13 I know it doesn't flow as well, but if we could  
14 swap that, that would be great.

15 CHAIR BURMAN: Yes, that's all right.  
16 Yes.

17 MR. JENSEN: There's conflicts with  
18 T&Q, as well. I have to leave at 4:00 to get to  
19 a flight.

20 CHAIR BURMAN: So when we come back  
21 from lunch, we'll rejigger a little bit, but  
22 hopefully, we'll also be able to figure it out,

1 so that maybe we can end --

2 PARTICIPANT: (Simultaneous Speaking)  
3 through lunch?

4 CHAIR BURMAN: Do people want us to  
5 order in and work through lunch?

6 PARTICIPANT: Yes.

7 CHAIR BURMAN: Does that make sense?  
8 Are we ordering pizzas?

9 PARTICIPANT: Sounds good to me.

10 CHAIR BURMAN: Who ordered last time?  
11 Who did the ordering last time? I went out, so I  
12 don't remember. I don't know who ordered. I  
13 just know that when I came back, there was pizza  
14 here. I'm going to assign somebody from here to  
15 be in charge of ordering in pizza, and we'll  
16 figure out the payment and all that.

17 I don't want to assign anybody. We  
18 need one person for industry to take care of  
19 industry folks, and then the government people  
20 have to do it separate. The government folks,  
21 I'm assigning someone from PHMSA to take care of  
22 state regulator people and PHMSA.

1                   (Whereupon, the above-entitled matter  
2 went off the record at 12:08 p.m. and resumed at  
3 12:29 p.m.)

4                   CHAIR BURMAN: All right. If we can  
5 settle down. We're going to get started with  
6 best practices. All right.

7                   MR. AMUNDSEN: You ready?

8                   CHAIR BURMAN: Yes, we're ready to go.

9                   MR. AMUNDSEN: Okay. Eric Amundsen  
10 with Energy Transfer and Chair of the Best  
11 Practice Subcommittee. I'm going to go into a  
12 little bit of schedule recovery mode here. I  
13 don't intend to rush through this, but there's  
14 been fantastic participation thus far this  
15 morning, so I don't want to --

16                   CHAIR BURMAN: Yes, no, we're good.

17                   MR. AMUNDSEN: Don't want to not  
18 encourage that, but we'll just get going here.  
19 So Subcommittee members supported by our ADFO,  
20 Max Kiebia, he wasn't able to be here this week,  
21 so thanks to Chris McClaren, who supported our  
22 group, leading up to the meeting, and yesterday's

1 meeting, so those in attendance are in blue, Leif  
2 Jensen is here, but he was attending another  
3 subcommittee meeting, Bryce Brown is -- has been  
4 mentioned, he was on vacation, and Cliff Johnson,  
5 with PRCI, had a conflict that he couldn't manage  
6 and wasn't able to join us, so thank you to the  
7 rest of the committee members, subcommittee  
8 members, for their participation.

9           And just throw this up real quickly.  
10 It's our existing task statement. No changes to  
11 it. And when you read this, you might recognize  
12 a lot of overlap with the process sharing  
13 subcommittee and there is a lot of overlap in the  
14 context of the sharing.

15           Again, the way that Mark and I kind of  
16 keep this straight is, you know, they kind of  
17 focus on the what and we kind of focus on the how  
18 in terms of -- or in the context of what's being  
19 done today in our industry in terms of best  
20 practices as well as what's being done in other  
21 industries, like FAA, in terms of best practices.  
22 So again, that's a pretty easy delineation to

1 understand.

2 And by the way, we have no formal  
3 recommendations to make, no voting to take place  
4 today, so again, encourage questions and  
5 discussion, but, you know, may be a little bit  
6 one-sided until we get to the end here.

7 I'd like to throw up our, kind of,  
8 visual model that Mark and I had worked on, you  
9 know, several months ago, and we talked about  
10 this again in our subcommittee meeting yesterday.  
11 I think at the end of the day our report will, in  
12 a lot of ways, attempt to describe this model,  
13 you know, kind of -- and its evolution from one  
14 that doesn't have a data hub in the middle, and  
15 not a lot of interaction between the various  
16 entities portrayed on this graphic, so at the end  
17 of the day it's, how do we interact, maybe, more  
18 effectively association to association, or  
19 association to stakeholders, or the regulators,  
20 or others on this graphic?

21 And again, that's ways that we will  
22 suggest in terms of best practices and the



1 process sharing committee will also identify what  
2 those pass and what the information might be, but  
3 I always like to come back to this to kind of  
4 keep grounded in, kind of, what I think our  
5 mission is, it's to, really, describe an  
6 effective way to manage information amongst all  
7 of these groups and to leverage the sharing that  
8 already takes place within a lot of these  
9 circles.

10 So a slide, basically, kind of  
11 highlighting our discussion from yesterday. We  
12 received, prior to the meeting, a draft report  
13 from Cliff Johnson and Jason Skow on ILI and ITD,  
14 or in the ditch, data management.

15 The report's been drafted in the  
16 report template, or outline, so we think a lot of  
17 the content in there will be able to slide right  
18 into the report as we start writing. In essence,  
19 it's a review of the -- or highlights API 1163,  
20 which will have another presentation today from  
21 Drew, Drew Hevle, on that, but again, kind of  
22 highlights the elements within API 1163 and how

1 that works, and recommended practice 0102, which  
2 again, is another ILI deployment industry  
3 standard.

4 And then the PRCI NDE 4E project,  
5 again, which was presented to us a couple  
6 meetings ago from Cliff Johnson, which is a  
7 really good example of how ILI data gets  
8 collected, de-identified, QA/QC'd, and processed  
9 and analyzed, so again, we feel like that model  
10 within that particular project within PRCI is  
11 really ready made for what we're talking about in  
12 terms of ILI and in-the-ditch data resolution and  
13 the sharing.

14 Next, we talked a taxonomy model that  
15 was developed by Joe Subsits and presented during  
16 the meeting yesterday. The model, in its  
17 simplicity, provides a common language and terms  
18 for a learning system, which is really results  
19 oriented.

20 I think it had some similarity to the  
21 model that COS, Center for Offshore Safety,  
22 presented yesterday as well. I think the beauty

1 of what Joe came up with is, it's a model that  
2 would kind of sit, if you, you know, go back to  
3 our graphic, could kind of sit within the VIS  
4 hub.

5           Maybe not amenable to sharing ILI  
6 data, per se, but certainly, sharing lessons  
7 learned, sharing near misses, sharing learnings  
8 from industry operator incidents, so again, Joe  
9 has provided a taxonomy model which, again, I  
10 think would be critical, you know, especially if  
11 we try to leverage the best practices that are  
12 currently occurring in a lot of the industry  
13 associations, like API, ALPL, and kind of give us  
14 a common platform for them to, maybe, use that  
15 taxonomy as they share information, but then also  
16 feed that into a broader sharing hub.

17           So I think Joe's model has a lot of  
18 utility in that regard. Joe, I don't know if you  
19 have any comments that you want to add to that or  
20 any clarifications.

21           MR. SUBSITS: The only I'd add, when  
22 we start looking at systems approaches, it's just

1 very hard to standardize and approach that allows  
2 you -- it already comes from more industry  
3 misses. There's a lot of opportunities going on  
4 in the learnings about quick possibilities for  
5 improvement. You have those available at your  
6 fingertips.

7 So I think it's important, it's  
8 something that's versatile and something that's  
9 effective, and something that's agile enough for  
10 the operator to be able to input personnel to  
11 utilize. So I think the model tries to encompass  
12 that.

13 MR. AMUNDSEN: Okay. Thank you.

14 Again, thank you for your efforts in putting that  
15 together. Next bullet. Subcommittee is awaiting  
16 delivery of various program and governance  
17 documents from some of the industry associations.  
18 We received some of that type of information from  
19 Asias, and thanks to Warren and Sherry for  
20 passing that along.

21 But again, we're looking for  
22 documents, already existing documents, that tell

1 us about, you know, how information sharing  
2 occurs within those different associations, you  
3 know, how it's governed, how they do the de-  
4 identification, how they do the QA/QC of the  
5 data, how they get over the barriers that might  
6 otherwise inhibit participation, and how they  
7 communicate results.

8 So again, that's kind of to those four  
9 or five bottom sub-bullets, but at the end of the  
10 day, we're trying to kind of focus and describe  
11 our best practices in terms of those elements of  
12 a sharing system or a process sharing system.

13 So looking for information so that the  
14 subcommittee doesn't have to go out and generate,  
15 or create, or write that information based on our  
16 knowledge or being involved in those processes.  
17 We're looking to kind of maybe save ourselves  
18 some work and looking for written information in  
19 that regard.

20 So to the extent we can get that, I  
21 think that'll help us move the report writing  
22 along and give us a document that we can

1 reference.

2 The next bullet, we discussed -- had  
3 a lot of discussion, probably, and I would kind  
4 of open that up to this group, maybe, for some  
5 more discussion about the opportunity for the  
6 public and other stakeholders to have an input  
7 into the VIS context, other than just a consumer  
8 role.

9 I think we've maybe not given enough  
10 thought and consideration to receiving input, you  
11 know, questions, or observations, or any kind of  
12 feedback from, you know, the outside stakeholder  
13 groups like the PSTs and other NGOs, the public,  
14 you know, how can we more -- how can we enrich,  
15 kind of, their participation in VIS as opposed to  
16 just a consumer of information?

17 So again, looking for more 360  
18 feedback from those types of groups. So again,  
19 more discussion to be had within our subcommittee  
20 on that. You know, John suggested -- I think  
21 he's had some contact with CONED and hopefully  
22 we'll gain some experience from them on how they

1 do that, how they -- you know, if they have a  
2 call center and how they receive, and process,  
3 and react to information from the public.

4 So I don't know if there's any  
5 questions, comments about that aspect of the VIS  
6 model. Kate? No? Okay.

7 Lastly, we had, as Mark mentioned this  
8 morning, there is a lot of overlap and, you know,  
9 we'll continue to discuss those overlaps and  
10 interdependencies with other subcommittees. You  
11 know, again, we're focused on best practices,  
12 kind of, in these five sub-bullets that I've  
13 mentioned.

14 That's where we're really, kind of,  
15 aligned, you know, in these various associations,  
16 and then even using, you know, Joe's taxonomy  
17 model, how do we address, you know, best practice  
18 in terms of how that model would be governed, you  
19 know, how we would, again, QA/QC the data and  
20 information that comes in, how would we apply  
21 common taxonomy in Joe's model, how we would  
22 secure the data and information, how we would,

1 again, overcome barriers to participation, a lot  
2 of what was talked about in Randy's discussion  
3 earlier, and then communication, and results, and  
4 performance.

5 So those are essentially the items  
6 that we're progressing. Kind of, next steps and  
7 action items, continue to develop our report  
8 outline and associated high-level content, target  
9 to complete a draft of that outline by the end of  
10 this month in preparation for July 2nd meeting  
11 that Mark mentioned this morning amongst process  
12 sharing, best practices, and the technology  
13 subcommittees.

14 Third bullet, solicit API and other  
15 associations, again, for documented practices. I  
16 know I've talked to Stewart and others about  
17 getting those documented practices to us, so  
18 we'll continue to run those down.

19 I think further development of a  
20 taxonomy model, again, kind of taking all of the  
21 things that we talked about earlier today and  
22 learned this week. You know, a good example is



1 Center for Offshore Safety and the model that  
2 they have on how they classify different types of  
3 learning events.

4 And I think, again, can be part of  
5 that taxonomy, kind of, defining criteria for the  
6 various types of learnings, I think, is very  
7 valuable.

8 And then last, but not least, you  
9 know, commence writing. You know, we're not  
10 going to get done if we don't get started, so I  
11 think that's going to be a real focus on -- for  
12 our subcommittee between now and the next in-  
13 person meeting for sure, is to actually start  
14 putting words on papers and, you know, finding  
15 ways to reference existing documents and working  
16 with, again, process sharing and the technology  
17 team to make sure that we're not duplicating any  
18 effort, that we're not creating any gaps in the  
19 report, and getting all those things fleshed out.

20 And with that, I'll end my report and  
21 open it up to comments, questions.

22 MR. BELLAMY: Michael Bellamy with

1 Baker Hughes G.E. Eric, at the end of your  
2 session there was a brief, kind of, discussion  
3 about API 1163 as a mechanism and its  
4 effectiveness as a mechanism for today, as  
5 configured today, for sharing information back  
6 and forth --

7 MR. AMUNDSEN: Yes.

8 MR. BELLAMY: -- and there's a  
9 suggestion that we, the committee, somebody,  
10 might conduct a survey of inline inspection  
11 operators to understand --

12 MR. AMUNDSEN: How that's being  
13 affected.

14 MR. BELLAMY: -- how that's working.

15 MR. AMUNDSEN: Yes.

16 MR. BELLAMY: And I don't know whether  
17 that's worth picking up on or not. There seemed  
18 to be some enthusiasm, Bill, I know you seconded  
19 Joe's suggestion, and, Joe, you suggested it, so  
20 I'm just wondering if that's something you want  
21 to take forward or not.

22 MR. HERETH: So in the report out I

1 did this morning, we talked about the idea of  
2 polling the respective stakeholder groups on what  
3 their expectations are out of this, so that would  
4 be a subset of that. If that could work, so our  
5 intent was to take that away, Sherry and I were  
6 going to work with the subcommittee to figure out  
7 how to go about doing that, because I think it's  
8 probably -- so, yes, we can do that, but I think  
9 we were thinking a little bit more broadly in  
10 terms of what your expectations are as a whole.

11 But I think, to your point, we should  
12 probably poll with respect to 1163 with both the  
13 ILI service providers as well as the operators.  
14 That's a good point.

15 MR. AMUNDSEN: You know, I think it's  
16 important to get both perspectives. You know, we  
17 put it out there as a best practice and something  
18 that is being done in the industry, but I don't  
19 have a good sense of how each operator and each  
20 service provider has participated in that event.

21 MR. HERETH: That's a great point.

22 MR. AMUNDSEN: And I think it would be

1 -- I think the results will be enlightening, and  
2 then as part of that, I think if the operators  
3 are not participating, what keeps them from doing  
4 that, right? Or what barriers, you know, keep  
5 them from participating in that.

6 MR. BELLAMY: Yes.

7 MR. AMUNDSEN: So understanding, not  
8 just the data, but maybe some of the whys of what  
9 the data might reveal, so we'll take that as a to  
10 work with, Mark.

11 MR. HERETH: Yes, we'll take that  
12 away. That's a good point.

13 CHAIR BURMAN: Any other comments?  
14 Questions? Holly? Is she on the phone? All  
15 right. So looking at this, there's nothing we  
16 need to vote on. Looks like we have a pretty  
17 good handle on things. Does anyone from the  
18 audience have any comment? I'm sorry, I forgot  
19 to ask. All right. I think we can go. Thank  
20 you very much.

21 And I do want to say a special thank  
22 you to Joe for your presentation and the

1 thoughtfulnes that went into it, and the  
2 substantive processing of it, and just, you  
3 constantly amaze me in terms of your ability to  
4 make things sound very easy, and also, get  
5 focused on very substantive and difficult topics  
6 in a way that makes sense.

7 And bridging, sort of, the distinction  
8 between industry and regulators and helping to  
9 facilitate communication is very, very helpful,  
10 so thank you very much. I appreciate it. With  
11 that, next, we will go to technology or, no, the  
12 training. TMQ or TMC?

13 MR. JENSEN: Good afternoon. While  
14 he's getting started, I'm Leif Jensen,  
15 Chairperson of the, what's currently, Training  
16 and Qualification Subcommittee. We might be  
17 entitled competency awareness and training.

18 (Off microphone comments)

19 All right. We met yesterday  
20 afternoon. Doug White was our ADFO. There's the  
21 numbers of our respective team. We do have a  
22 motion at play, if you've been listening to me

1 carefully how I've been characterizing our  
2 current subcommittee name. We are proposing that  
3 we change the name to Competency Awareness and  
4 Training.

5 There's two primary reasons. It  
6 aligns directly with the title of Element 13 and  
7 PSMS, and it dissuades the confusion with respect  
8 to operator qualification, so I will open it up  
9 to discussion on my motion.

10 MR. PARKER: I'll second.

11 MR. JENSEN: The third reason, it's an  
12 acronym for CAT.

13 MR. AMUNDSEN: Not that you're hurting  
14 them.

15 MR. JENSEN: Yes, not that we're  
16 hurting cats.

17 CHAIR BURMAN: All right. Well, as  
18 the floor person now, you've lost my --

19 (Simultaneous speaking)

20 MR. JENSEN: Hearing no discussion,  
21 I'd like to make a motion.

22 CHAIR BURMAN: Okay. There's motion,

1 any discussion? No. Second?

2 MR. PARKER: I'll second.

3 CHAIR BURMAN: All right. Any  
4 discussion? Okay. Hearing none, all those in  
5 favor, please say aye.

6 (Chorus of ayes)

7 CHAIR BURMAN: Opposed. Abstentions.  
8 The motion carries. You're now CAT.

9 MR. JENSEN: So what we did yesterday,  
10 and let me backup just a little bit, previous  
11 meetings, the subcommittee members have been  
12 doing a lot of listening, participating in other  
13 subcommittees, because we really can't project  
14 what we want to train until we know what the  
15 deliverables and recommendations are from the  
16 other subcommittees.

17 But yesterday, we actually met and we  
18 took everything that we've heard thus far and  
19 documented, and categorized them into the three  
20 categories; competency, awareness, and training.

21 So this isn't a comprehensive list of  
22 everything that we've compiled, but it's a good

1 chunk of it. So first and foremost, job  
2 descriptions should be offered that defined the  
3 education, knowledge, skills, abilities, and  
4 experience necessary for those working with  
5 confidential data and information that'll foster  
6 the hiring criteria for third-party data  
7 administrator.

8 And the concept here is that the  
9 people who are working in the hub need to be  
10 capable and competent. Second one is, a process  
11 should be established to prepare VIS analytical  
12 staff with pipeline and ILI SMEs, as those who  
13 are hired to perform data analytics may not know  
14 our language.

15 And that's directly from the FAA and  
16 that they had -- they've hired mathematicians and  
17 statisticians and they needed to bring in pilots  
18 and professionals so that they could speak the  
19 language.

20 And then thirdly, a vetting and  
21 certification process should be developed for  
22 employees working within the VIS to ensure,



1 primarily, two things, that they protect the  
2 security of the data, and preserve members  
3 anonymity and confidentiality.

4 So those are the fundamental tenets of  
5 competency.

6 Moving on to awareness, the theme here  
7 of awareness, as we've all been talking, trying  
8 to influence and persuade people to voluntarily  
9 participate in the program. So we ought to, you  
10 know, offer educational materials, calling them  
11 talking points, that we should use to promote the  
12 pipeline safety and encourage stakeholders to  
13 join.

14 And so listed there are just some of  
15 the elements that we brainstormed that could get  
16 incorporated into those talking points. And then  
17 ultimately be used at conferences, on Web sites,  
18 for all the variety of stakeholders, and even  
19 literature that we may produce, and to use some  
20 else's term earlier today, as we campaign to get  
21 people to join our effort.

22 I won't read through them verbatim.

1 You can glance at them before I put them away.  
2 Lastly, I have a few slides on training and  
3 training is a little bit larger than the other  
4 two in that, we have to recognize the audiences  
5 that we are going to train.

6 So the distinct audiences are those  
7 who are going to give us input, and then those  
8 who are going to process that input, and then, we  
9 have to train those who are going to receive the  
10 output, right?

11 And then with respect to the output,  
12 and this came up at our last meeting, we really  
13 have two distinct audiences, there's going to be  
14 the audience that's really thirsty for the ILI-  
15 rich data, the big data, all the features, the  
16 as-found versus the as-called-type data, to  
17 improve what's, literally, specified in the  
18 statute, that ILI vendor to operator  
19 correspondence to rapidly increase the  
20 advancement of technology, and finding out where  
21 those features exist.

22 The second type of training or

1 deliverable is that information-rich, the lessons  
2 learned, the near-miss data, the trending, the  
3 stuff that, to much extent, already exists today  
4 within INGA, SGA, AGA, API, all those different  
5 forms, but formalizing that underneath this VIS  
6 as it's prescribed in our mission statement.

7 And then, of course, all the  
8 regulatory agencies, including local, state, and  
9 federal.

10 Training, initial training should be  
11 developed to enable the development and  
12 implementation of VIS. I know that's  
13 extraordinarily broad, but I wanted to plagiarize  
14 it out of the PSMS API 1173. That's almost  
15 verbatim what they say in 1173, so plagiarism at  
16 its best.

17 Second bullet, training modules should  
18 be developed that instruct participants utilizing  
19 a systematic approach to training. Meaning, we  
20 want to teach the right things to the right  
21 people at the right time and the right  
22 methodology.

1                   So training participants in the  
2 methodology for data submissions include types of  
3 input, how to input, the format, et cetera, and  
4 essentially, if we're going to create a form for  
5 data submission, we're going to take that form  
6 and train to the form.

7                   We ought to have a code of conduct for  
8 handling both identified and de-identified data.  
9 And let me just pause there for a minute and  
10 reflect on some of the things we heard from the  
11 FAA that, you know, they desired an approach  
12 where the information get processed prior to the  
13 de-identified, so they could ask clarifying  
14 questions to the submitter.

15                  So if we institute a similar process,  
16 we're going to make sure, and have to have in  
17 place, rules of the games so the people who see  
18 that data are held to account not to leak that  
19 data or that information.

20                  And then training modules with  
21 certificate of successful completion for entry  
22 into that hub. And then lastly, confidentiality

1 requirements, how are we going to de-identify the  
2 data and then methods to validate data integrity  
3 with rigorous and robust QA/QC prior to  
4 publishing any reports.

5 And then lastly, at the last VIS  
6 meeting, if you recall, we were asked to reflect  
7 on, you know, what type of funding do we need and  
8 what is all this going to cost?

9 And while this isn't final, but we  
10 believe that in the final report, we ought to  
11 recommend that funds be appropriated for defining  
12 the job criteria and documenting the hiring  
13 process, funds ought to be appropriated to  
14 develop the training curriculum, and that  
15 training curriculum really should be designed and  
16 developed by qualified instructional designers,  
17 we should appropriate funds for Web-based and  
18 instruction-led training courses, and then of  
19 course, the fourth bullet, all the costs to  
20 administer that training.

21 There's possibility for cost-sharing  
22 mechanisms for definitions by industry and

1 government, I think we ought to explore that, and  
2 then what we heard yesterday from Vivek, you  
3 know, when you look at the evolution of funding  
4 and in the spirit of phasing this, maybe we start  
5 with grants and then we go into the R&D, and then  
6 once we have the program developed, we actually  
7 look for a building, or, you know, a complex to  
8 rent, and some fixed equipment, and then phase  
9 into an operational, and bring this to  
10 conclusion.

11           Hopefully not in 12 years, but  
12 something much less than that. And in the spirit  
13 of rapid and going through that at warp speed,  
14 that's the Competency Awareness and Training  
15 Subcommittee's report.

16           CHAIR BURMAN: Any comments? Any  
17 questions? Holly? In the audience?

18           MR. VEENSTRA: If you go back one  
19 slide that said, my eyes are correcting me, you  
20 said phase money and grants, research  
21 development, facilities and equipment. Where do  
22 you see facilities and equipment, what role to do

1 you see that playing?

2 MR. JENSEN: Well, you know, I'm  
3 basing that statement -- we're basing that  
4 statement off what we heard yesterday from the  
5 FAA perspective, and, you know, at some point in  
6 time, if we end up having a population of 10  
7 employees, or 20 employees, working inside the  
8 hub, they have to office somewhere, they have to  
9 have equipment, so it's not equipment to be used  
10 in the field, it's not equipment that we're going  
11 to run through the pipelines, it's office.

12 CHAIR BURMAN: Okay. Anybody else  
13 have any comments or questions? Okay. Thank you  
14 very much. With that, why don't we grab pizza  
15 and then we'll go to the next subcommittee in  
16 technology.

17 MR. WARNER: I have a hard stop at  
18 1:30, so I can get to another call, so if we can  
19 grab pizza quick.

20 CHAIR BURMAN: Right. Yes. Very  
21 quick. Yes, this is the industry group,  
22 government people. Right. Government people.

1                   (Whereupon, the above-entitled matter  
2 went off the record at 12:59 p.m. and resumed at  
3 1:02 p.m.)

4                   CHAIR BURMAN: Okay. We're going to  
5 get started. We're in the Technology  
6 Subcommittee right now, reporting.

7                   MR. WARNER: All right. So I'll try  
8 to not eat and talk at the same time for this  
9 presentation. I think it's going to be a quick  
10 presentation on what we're doing, the meat, or  
11 one of the key aspects of what we're doing is  
12 going to be reported out later this afternoon.  
13 Jason Cradit will give you a quick overview of  
14 the work that he and others have done to look at  
15 the architecture that they're considering for VIS  
16 going forward, so that's going to be coming up  
17 shortly.

18                   So subcommittee if made up of the  
19 following people that you can see on the list  
20 there. Bryce is on vacation, so that's why I'm  
21 stepping in for Bryce to facilitate yesterday and  
22 then this report out.



1 Chris has done a great job supporting  
2 us and keeping us on track through these last few  
3 months.

4 I'm going to skip by the task  
5 statement. There's no changes to that. The  
6 important thing is the second bullet there, we've  
7 got three workgroups, a substance group, an  
8 architecture/IT, who you'll hear from, and then  
9 continuous improvement R&D group.

10 And in the last month, we've had a  
11 couple presentations in concert with other  
12 groups, but one that specifically was called for  
13 by our committee was from One Bridge Solutions,  
14 and presented by Robin Magleky.

15 One of the things we were interested  
16 in was, many of us have heard the terminology,  
17 data analysis and machine learning, but have no  
18 experience with it, and we heard of One Bridge's  
19 efforts on looking at ILI runs and datamining ILI  
20 runs.

21 So we had One Bridge make that  
22 presentation, so I asked them to give us a little

1 education around that as well.

2 Quick review of the different  
3 subgroups, the substance group, Bryce Brown is  
4 working with that reviewing the overlaps, and we  
5 continue to meet with the process sharing, like  
6 Mark mentioned, and finding continuous overlaps,  
7 but also, continuous opportunities to educate  
8 each other, and help flesh-out our roles.

9 On the architecture side, Jason Cradit  
10 has been -- and is it Mark has been working with  
11 you?

12 MR. CRADIT: Mark, yes.

13 MR. WARNER: Have been the primary  
14 leaders in looking at the architecture and the  
15 IT. And they've actually teamed up with  
16 Microsoft, and that's what he's going to talk  
17 about here in his presentation, to come up with  
18 some ideas for different stages in IT  
19 architecture, so that'll be coming up here  
20 shortly.

21 Yesterday's meeting was primarily  
22 spent around looking at the documentation that

1 we've come up with so far to discuss what a  
2 continuous improvement process would look like,  
3 and then, several case studies around ECA and ILI  
4 to hopefully put a little bit more flesh and  
5 understanding as to what that might look like in  
6 a real-world context.

7           It was a lot more lively and energetic  
8 discussion than I anticipated it would be, and  
9 gave Michael and I a lot of food for thought; a  
10 lot of great input. We're going to go back and  
11 we got focused on how continuous improvement was  
12 going to improve technology, with the assumption  
13 that that would lead to improved public safety,  
14 but really got good input that that piece, from a  
15 public perspective, or someone outside the  
16 industry, may not take that -- make that link  
17 between the two, so we're going to strengthen  
18 that a little bit more in the document that we're  
19 putting together.

20           Quick overview of the document, it  
21 discusses the needs and benefits to key  
22 stakeholders of VIS in terms of continually

1 improving the way the stakeholders may have  
2 information and be able to do their work,  
3 motivations for getting involved in it from a  
4 continuous improvement perspective, and then,  
5 some ideas that we have on how to encourage  
6 participation and how what key KPIs, performance  
7 indicators, may be useful to show early successes  
8 and early value to the VIS itself.

9 So you can see just from reading some  
10 of those things, a lot of different committees  
11 have talked about those things and we're  
12 wrestling with those too, so there's places to  
13 cross-support each other.

14 And that's it. That's the committee  
15 report out. Any questions from anybody?

16 CHAIR BURMAN: Any questions or  
17 comments at the table? On the phone? In the  
18 audience? No. Great. And we'll look forward to  
19 the IT architecture discussion later, so thank  
20 you.

21 MR. WARNER: Okay.

22 CHAIR BURMAN: Thanks very much. Now,

1 with that, we will go to the last subcommittee  
2 report, which is Reporting. Is that Sherry?

3 MS. RODRIGUEZ: Reporting was Sherry  
4 and I, but it was only she and I in the meeting,  
5 so there isn't much to report out on, from what I  
6 understand.

7 CHAIR BURMAN: Okay. All right. So  
8 right now, we will just -- I know some people are  
9 -- we can start early with the -- if the folks  
10 are ready. Okay. So we're going to start early  
11 with Agenda Item 2, and we're going to do that in  
12 a minute, and just flag when the government pizza  
13 comes. It is here? No. That's the industry  
14 pizza. Yes.

15 So I will say just -- I once did a,  
16 when I was Chief Counsel in the New York State  
17 Senate, we had a three-way agreement work -- we  
18 had three-way negotiations at, like, 2:00 in the  
19 morning, and the other -- the House, the  
20 Assembly, and the Governor's Office wouldn't let  
21 us leave, so my staff had to stay, so I asked my  
22 staff, when I was sitting in the office, what do

1 you want me to -- what do you want to do?

2           They said, we need pizza, so I went  
3 and got pizza for my staff, which caused a  
4 disruption to -- because apparently I should have  
5 bought it for everybody, and we ended  
6 negotiations, but my staff got to eat pizza, so I  
7 now understand why everyone else was so angry at  
8 me, but -- so all right.

9           MR. HERETH: Let the record show that  
10 people being in great anticipation of food or  
11 having their mouths stuffed got us through those  
12 reports very quickly.

13           CHAIR BURMAN: Maybe we need to eat  
14 earlier.

15           DR. MURRAY: Well, I'll go ahead and  
16 tee-up our next guest. We have Mr. John DeLeeuw  
17 and Ms. Vickie Toman, who will be joining us from  
18 American Airlines to talk about their experience  
19 with aviation information sharing.

20                   Primarily as it also relates to safety  
21 management systems. If you remember, John, you  
22 may remember his illustrious voice by phone from

1       our April meeting, he joined in and introduced  
2       himself, and talked a little bit about his  
3       background, but we're certainly interested in  
4       hearing a lot more from his experience with  
5       working with NTSB, safety management systems.

6                   I think John has even dabbled a little  
7       bit in the pipeline work, but he'll tell you  
8       more. I don't want to steal his thunder. Thank  
9       you.

10                   CAPTAIN DELEEUW: Well, good  
11       afternoon, and thank you for the pizza, whoever  
12       paid for it.

13                   MR. HERETH: Can I just talk about one  
14       thing, you guys want to trade, when your pizza's  
15       -- like, eat some of these and then trade back  
16       some of your pizza.

17                   CHAIR BURMAN: That's all right. Too  
18       complicated.

19                   (Off microphone comments)

20                   CAPTAIN DELEEUW: Well, thank you.  
21       I'm glad we got started early because it gives us  
22       a chance to --

1 DR. MURRAY: Our guest is speaking,  
2 you guys. Thank you.

3 CAPTAIN DELEEUW: -- get started early  
4 because there's a lot of information, and so my  
5 name is John DeLeeuw. This is Vickie Toman, who  
6 will introduce herself a little bit better in a  
7 minute, but we did catch the tail end of some of  
8 the conversations you were having, which is the  
9 same conversations that we had in our industry 30  
10 years ago.

11 So we'll talk a little bit about that.  
12 We'll get to the presentation here, but if  
13 somebody has a question, feel free to ask. I  
14 don't want to lose anybody because we certainly  
15 use acronyms, and you know how that is, so TLAs,  
16 letter identifiers and acronyms.

17 So let's get started here, so ASAP,  
18 this is something that the airline's been using,  
19 and we're going to talk a little bit about it,  
20 and it kind of corresponds with what you're  
21 saying here, and I do this with my colleague,  
22 Vickie Toman, and I'll tell you a little bit



1 about Vickie.

2 So Vickie's background, and she  
3 started 30 years ago as a flight attendant with  
4 Air Midwest, I don't know if any of you ever  
5 heard or seen Air Midwest, fun time, so she did  
6 this for about ten years.

7 (Off microphone comments)

8 MS. TOMAN: I did work there for ten  
9 years, that is where I started.

10 CAPTAIN DELEEUW: Right. So Vickie  
11 and me worked together for years. After she was  
12 a flight attendant, she got into regulatory  
13 affairs, she's almost done everything you could  
14 do at American Airlines. Now, we don't represent  
15 American Airlines here, just so you know, but  
16 this is our background, so you know where we're  
17 coming from.

18 And besides regulatory affairs, and a  
19 number of things in American, I think that's real  
20 key, is that, when the ASAP program first started  
21 at American, she was very instrumental in getting  
22 it started, so all of the bad things, the good

1 things, the things that weren't working, we've  
2 seen them all, and we believe we can tell you  
3 that, we started in the pre-Kindergarten stage.

4 If you were to do something like this  
5 in the military, you'd be starting at a high  
6 school level, because all the bad mistakes and  
7 the lessons learned, we've already figured all  
8 that out, not because we're smart, we just  
9 learned them.

10 So this is Vickie's background, so  
11 Vickie?

12 MS. TOMAN: Yes. So this is John's  
13 background. John started out in the military and  
14 he was a C-130 pilot for the Air Force, and flew  
15 for the Air Force for 15 years, did a lot of  
16 different missions, and then came over to  
17 American Airlines and started on 727, I think,  
18 and now he flies our number one aircraft that we  
19 have, the 787, which flies to China, all  
20 international flights, and I think you work,  
21 what, maybe three days a month, something like  
22 that?

1                   CAPTAIN DELEEUW:  Yes, I work three  
2                   days a month.

3                   MS. TOMAN:  I'm still in the trenches.  
4                   I'm the flight SMS manager for American Airlines,  
5                   so I'm responsible for our Safety Management  
6                   Program that we have for the flight operations.

7                   CAPTAIN DELEEUW:  So the 787, I show  
8                   some pictures up here because I love flying this  
9                   airplane.  How many of you all been on a  
10                  Dreamliner?  It's great because it's -- man, you  
11                  dream good on this airplane.

12                  (Off microphone comments)

13                  Yes, it's a great one.  I love this  
14                  airplane.  It's a great airplane.  I typically do  
15                  fly it from Dallas to China.  It's about a 16-  
16                  hour flight.  We have four crew members, or four  
17                  pilots, so we take turns.  Two guys fly three and  
18                  a half hours, and then the other two pilots fly  
19                  three and a half hours, so we keep doing that  
20                  back and forth until we get to China.

21                  And on your time off, we've got a crew  
22                  facility to sleep in.  I generally like to watch

1 a movie and eat an ice cream sundae, so it's not  
2 a bad life, I can tell you. It's great.

3 And so to go back there and back the  
4 16 hours, so we layover less time than the entire  
5 flight goes over, so it's continual flying. This  
6 is looking out the window. We haul a lot of new  
7 technology, like the heads-up display unit. Both  
8 pilots have this available to them.

9 This is the cockpit of the 787, which  
10 I'll talk a little bit about later, but you'll  
11 see the instrumentation here, it's all glass  
12 cockpit, there are no circuit breakers to pull,  
13 it's all electronic. This is an electronic jet.  
14 Most of those things you hear about in your world  
15 about hazardous stuff, like bleed air systems,  
16 people breathing in bad fumes, this airplane  
17 doesn't exist. Everything's electric. Even the  
18 brakes are electric.

19 The anti-icing's electric. So there's  
20 no bleed air that comes through this to get you  
21 sick. Max cabin altitude in this airplane is  
22 6000 feet, and we typically cruise at 41,000 feet

1 when we fly to China. Great airplane; modern  
2 technology.

3 MS. TOMAN: So this is any normal day  
4 at any major airport in America, and you'll see  
5 planes lined up like this. Hopefully you don't  
6 sit in that line very long, unless there's  
7 weather, which, we had yesterday coming into  
8 D.C., but you can see all the different airlines,  
9 and then this is another given day. This is how  
10 many planes are up there flying.

11 CAPTAIN DELEEUW: This is a hazardous  
12 environment. Probably very similar to the  
13 pipeline and hazardous material people, folks.  
14 Right? This is a hazardous environment. This is  
15 any typical day and everybody that's flying one  
16 of these blue little airplanes is a professional  
17 pilot, just like the folks that work for you.  
18 They're professionals.

19 Nobody wakes up in the morning and  
20 says, I'm going to do a bad job. Everybody wakes  
21 up because they're professionals.

22 MS. TOMAN: So what do we all have in

1 common? What keeps everything so safe in the  
2 airline business? It's our ASAP program. The  
3 FAA developed the ASAP program to prevent  
4 accidents and incidents, and encourage employees  
5 to voluntarily submit reports, so that's what  
6 we're here to talk to you about.

7 CAPTAIN DELEEUW: So we'll talk a  
8 little bit about it, so just so you know, because  
9 I heard some discussion here, interesting, this  
10 is an Advisory Circular that came out from the  
11 FAA, so when this started, that's how it got  
12 started, and it actually started with one  
13 airline, it just happened to be American  
14 Airlines, who we do not represent, but we work  
15 for, and they partnered with American Airlines,  
16 says, hey, we got this great program. We'd like  
17 to have somebody get involved.

18 So the idea behind it, as Vickie said,  
19 it's to create a culture where employees can  
20 voluntarily report a mistake they make.

21 When I was a pilot back in the early  
22 '90s at American, they mentioned this, I go,

1       there's no way I'm ever going to report my  
2       mistakes, because I don't want to get fired. So  
3       we'll talk about how it works and why does it  
4       work.

5                   So the big thing is, even if you have  
6       a violation, we want to hear about it, which, for  
7       some people go, that just seems weird. So if you  
8       have a potential violation, or you have a  
9       potential safety concern, if you report this in  
10      ASAP, we're going to take a look at it.

11                   MS. TOMAN: And another big thing is,  
12      you know, within ASAP, within our airline, if you  
13      submit that ASAP report, you're not going to get  
14      any disciplinary action from the company. So  
15      that's part of the agreement, the buy-in from the  
16      company, is we want -- I mean, why would anybody  
17      tell someone that, oh, yes, I screwed up? And  
18      especially a pilot, you know?

19                   But we want them to submit those  
20      reports, so you're not going to get that  
21      disciplinary action, and we'll talk a little bit  
22      later too, that buy-in for the regulatory

1 authority, for the FAA, they're not going to be  
2 having any disciplinary action.

3 So that's where the buy-in for the  
4 actual employee to submit that ASAP report and  
5 tell on themselves.

6 CAPTAIN DELEEUW: And the big thing  
7 behind it, which we all know, we do make  
8 mistakes, generally not intentional, we need to  
9 know why you made the mistake, because we want to  
10 do the deep dive, because maybe I need to go into  
11 the simulator and correct a bad habit pattern I  
12 may have.

13 For the maintenance world, it may be  
14 a little better understanding of how we do it and  
15 why we do it that way.

16 So, you know, when you get this kind  
17 of stuff, you get all this data that comes in,  
18 we'll talk about it here, all the data coming in,  
19 and when you use the data, you could go ahead and  
20 take a look at the data, because what we want to  
21 do is, one report might prevent a future accident  
22 that we get from employees. We've got lots of



1 examples of that, I'm going to show you, but that  
2 one report might make the difference to the  
3 industry.

4 So back in the early '50s, nuclear  
5 industry was going fast and wild, they're  
6 building nuclear power plants, but the thing that  
7 was most concerning was, is, at that time, and  
8 most of you probably heard about those days, you  
9 know, if you made a mistake, particularly in the  
10 nuclear world, they just fired you. They ran you  
11 off, as they say on a rig, we're just going to  
12 run you off.

13 And they said, that's okay, because  
14 we'll go hire another nuclear engineer. Well,  
15 what happened is, they actually ran out of  
16 nuclear engineers, they fired everybody, because  
17 people make mistakes. So they said, we got to do  
18 a better program.

19 So they decided that, you know, if you  
20 have a nuclear engineer who's been there for 20  
21 years and makes a mistake, inadvertent mistake,  
22 you fire that person, you hire a new kid out of

1 college who's got six month's experience, you  
2 think they're going to be safer? Probably not.

3 In fact, if the reason that the 20-  
4 year employee made the mistake is because a  
5 policy, or procedure, or work card was written  
6 incorrectly, the kid that just came out of  
7 college will make the same mistake, so the idea  
8 is, let's keep our employees here, figure out why  
9 they make mistakes.

10 So with the nuclear industry, that  
11 kind of got things started, and they saw the  
12 value of it, and the FAA saw the value of it, the  
13 industry that we're in, and so we started the  
14 same program, which we called ASAP, and we really  
15 want their concerns and potential violations.

16 Some of you might relate to this here.  
17 So we also do work with the petroleum industry,  
18 you know, like on old deep-oil rigs, about five  
19 years ago, they started going, man, we hurt a lot  
20 of people, and we kill people. We'd like to have  
21 something that aviation has, so it's actually up  
22 and coming. A lot of people supporting it and I

1 won't say who, where, when, but this program is  
2 coming to the Gulf of Mexico within the next  
3 year.

4 And all the oil companies are going to  
5 be getting onboard, so it's starting to come  
6 through the industry.

7 Well, take a look at this dial here,  
8 this is a perfect example. If you look at this  
9 gauge here, the employee in the petroleum  
10 industry had to read the gauge and report on the  
11 pressure. So on this one here, that looks about  
12 370, maybe 350, does that look like to you guys,  
13 350? That's what he wrote down. They later had  
14 a blowout, not a blow on the rig, but a blow on  
15 the pipe, because it's times 10. That's actually  
16 3000.

17 So you go, all of us in the room get  
18 it, and go, well, that's just stupid, but this  
19 has been here forever, but you know what, the  
20 employees know it, and they all know, tribal  
21 knowledge, you know, don't forget, times 10.

22 You get a new employee out there and,

1 as you all know, our workforce is starting to  
2 retire, a lot of people, getting new kids in the  
3 industry, you think they'll make a mistake? You  
4 bet. We set them up big time, because who would  
5 build a gauge like this nowadays, right? We  
6 wouldn't.

7 So this is the kind of stuff that we  
8 find out in our aviation world. So I'll let  
9 Vickie tell you about some of the purpose here of  
10 ASAP here.

11 MS. TOMAN: Okay. So as we've already  
12 said, you know, we want to know that information  
13 from our employees. We ask for employees to  
14 report hazards, they can report it  
15 confidentiality through the ASAP program, and  
16 then also, if they are involved where they had a  
17 deviation from a regulation or a company police  
18 or procedure, they can submit an ASAP report.

19 They know it's going to be  
20 confidential, it's going to go to a certain  
21 group, which we'll talk about in just a second,  
22 but we are going to go and look at those reports

1 and try to identify the root cause, because  
2 again, the way our system is setup, we want to  
3 have a system that has layers where you're not  
4 going to get to that individual human error.

5 And so when we do have that human  
6 error, we need to look at whether it's policies  
7 or procedures that need to be changed, whether  
8 it's training, and also, if you've got something  
9 like this happening in Miami, you can probably be  
10 guaranteed you're going to see it in L.A., you  
11 may see it in New York, so we want to look at it  
12 from a systemic approach.

13 And then the other thing is, building  
14 the trust. John said that we started, when we  
15 first started the ASAP program, I was working in  
16 safety, and this was a hard thing, especially for  
17 our regulators, to kind of put their head around,  
18 because back then, in the '80s, the FAA had a  
19 badge, you know, we don't have badges, and that  
20 was what they used, you know, for corrective  
21 action against pilots.

22 So to go to the FAA and say, no, we're

1 going to review this report, we're going to  
2 accept it, and we're not going to do certificate  
3 action, was a little hard for that agency.

4 CAPTAIN DELEEUW: So let's get to the  
5 whole crux of this why ASAP works in the  
6 industry. So can you all see this sign here?  
7 Okay. So let me give you an example that  
8 happened in our world. I'm a pilot, I'm driving  
9 down the back streets of -- back roads of  
10 Louisiana, and I realize I ran a stop sign.

11 As I'm driving by it I go, oh, crap,  
12 ran a stop sign. In our world, when we're  
13 driving down the road, the first police station  
14 we go to, I will turn myself in. You pull in,  
15 knock on the door, yes, listen, I'm a pilot with  
16 American. I ran the stop sign back there.

17 Police officer would say, okay, well,  
18 appreciate you coming in. I want you to fill out  
19 this form, which is critical. So in the form I'm  
20 going to fill out, it's going to ask the  
21 questions, was it daytime, nighttime? How fast  
22 were you driving? Did you have a passenger in

1 the seat? Were you on your phone? Were you  
2 texting? Did you have kids in the backseat?  
3 What kind of car were you driving, by the way?  
4 Was the windshield dirty?

5 We're going to ask all these  
6 questions. We don't want a big narrative,  
7 because we're going to ask a lot of questions,  
8 because we want to know. So when I walk out the  
9 door, I filled out -- as I walk out the door, and  
10 that in itself, you say, well, that's not a big  
11 door, but as I walk out the door, the police  
12 officer says, hey, don't feel too bad, because we  
13 had 43 other pilots in the last two weeks do the  
14 same thing you did. Really?

15 Well, I don't feel too bad, but I go,  
16 I can't believe that. What happens, the police,  
17 like the airlines, which you will do someday, is,  
18 you're going to go, well, one report, get it, but  
19 we got 43 reports. We got some noise out there,  
20 right? What's going on?

21 The police will go back and go, yes,  
22 you made a mistake, but we kind of set you up,

1 because the stop sign's been turned, trees have  
2 overgrown the stop sign, in fact, the paint has  
3 faded on it, so yes, you shouldn't have run a  
4 stop sign, but we didn't help you out much.

5 So this, I'll let you take a second  
6 just to read it, is the crux of where we are now  
7 in our industry. This is very important. And  
8 the last sentence is most critical, the  
9 regulator, the industries, the airlines, the  
10 unions, they're not interested in catching  
11 employees making mistakes, but what they do want  
12 is they want reporting mistakes so we can get the  
13 trends and we can fix the problem. That's the  
14 key to the ASAP program.

15 So here's a typical case. You got  
16 ASAP deviations, most of the time when you do air  
17 and altitude, you know, hey, what was your  
18 altitude? I'm correcting back to 30,000 feet.  
19 Okay. We made an altitude error. Most of them,  
20 the company would never know about, but now that  
21 we report them, 98 percent of those altitude  
22 deviations are reported through ASAP.



1                   And that's helpful, because we want to  
2 know, okay, aggregate data, where are all these  
3 deviations happening? They happen at climb out?  
4 They happen on descend? So if I just ask the  
5 crowd here, if we have an altitude deviation from  
6 a crew, they're on the wrong altitude, they  
7 missed an altitude, do you think it happens on  
8 climb out, level flight, or descend? What do you  
9 think?

10                   MS. MORGAN: Level flight.

11                   CAPTAIN DELEEUW: Level flight. Yes,  
12 we would all think level flight. No, it's about  
13 70 percent happen on the descend, because what's  
14 happening, both pilots are in the cockpit doing  
15 this on their programming, the runway change for  
16 the arrival, and then they miss an altitude. Now  
17 that we know that information, we can help the  
18 pilots say, be advised, this is what happens.

19                   See, just a simple thing like that.  
20 Vickie, why don't you tell them what happened  
21 over here in Haiti.

22                   MS. TOMAN: Okay. So this was in a

1 report that we got, and this was just one ASAP  
2 report, so that's -- you know, we've kind of  
3 talked about how you got the 43 different  
4 reports, all the noise, but also know that one  
5 report can be something significant, which you  
6 can enhance safety from.

7           So we had a Captain that had been  
8 flying to Haiti and he had gone there quite a  
9 bit, and he noticed this new tower that was put  
10 up on the side by the runway. And it was kind of  
11 like, you know, what's that? It's not listed in  
12 any of our company manuals that it should be  
13 there.

14           And so he submitted his ASAP report.  
15 So you can see the tower off to the side.

16           CAPTAIN DELEEUW: This tower is right  
17 here and the Captain was concerned. Now, we  
18 allow pictures in ASAP. They have to be  
19 appropriate, of course, but I mean, let's be  
20 fair, but if you have a picture, and you know,  
21 you can write a narrative and not really describe  
22 it. Putting a picture is worth a 1000 words, so

1 that's really critical.

2 So he has the 1st Officer take a  
3 picture of what happened. So got the picture  
4 right over here.

5 MS. TOMAN: So we looked at it and  
6 it's like, what the heck is that tower doing  
7 there, you know? This could be a hazard for an  
8 airplane taking off. And so, come to find out,  
9 it was, I think it was, the mayor of the town was  
10 like a big baseball fan, and I forget, was it the  
11 Yankees, and they were going to be in the  
12 playoffs, and so he decided to go put that tower  
13 up so he could see the baseball game.

14 And it's like, can we put it somewhere  
15 that's not near the airport, please? But we were  
16 able to work with the regulatory authority there  
17 and get that moved. Again, that was just one  
18 report from one pilot, which was a significant  
19 change for safety for everybody that was flying  
20 into that area.

21 CAPTAIN DELEEUW: So in that case, the  
22 regulator gets out and puts a little note, and we

1 call them, notice to airman, hey, be advised, a  
2 tower is being built. We're going to get it torn  
3 down. The companies, the unions, they all talk  
4 to each, and safety. Safety is not a secret in  
5 the airline business, and they call each other  
6 and go, hey, just be advise, there's a tower at  
7 Port-au-Prince now.

8 Oh, okay. Great. Thanks for letting  
9 us know. That's how it works.

10 So if I file a report the next time I  
11 fly to China, I make a mistake, my report goes to  
12 the corporation, where we have analysts who  
13 redact all the information. So if I'm flying  
14 with Vickie and I say, you know, I was flying  
15 with Vickie Toman, and we were flying to China,  
16 and something happened, well, it's a confidential  
17 report.

18 So they're going to take my name off,  
19 they'll take Vickie's name off, they might even  
20 take the city if that's not important enough.  
21 They want to de-identify it, because they want  
22 the ERC, Event Review Committee, to look at the

1 report without the names in it because some of  
2 the guys might actually know me. You know, we  
3 don't want that.

4 We want this to be looked at exactly  
5 the way it is, free of anything, you know, who's  
6 there?

7 So you'll see that you have a company  
8 person, a regulator, in the airline world, it's  
9 typically unions, of course, but you could have  
10 an employee representative, because you got to  
11 balance it out. You need to have somebody that's  
12 there so that all three are there. Every  
13 decision made is unanimous.

14 MS. TOMAN: And we refer to this, the  
15 ERC, the Event Review Committee, as like a three-  
16 legged stool. It's all got to be even. If you  
17 have, the regulator has more power than the other  
18 two people, the stool's going to tip over, right?  
19 So everybody is working together as a team.

20 CAPTAIN DELEEUW: It's all for safety.  
21 So when you were -- and I've had a lot of folks  
22 from the industry have gone to ERCs that me and

1 Vickie have been involved with, and they observed  
2 the ERC, because they're interested, like you  
3 folks might be. So I had Chevron, Exxon, Mobil,  
4 medical world, pipeline, Carnival Cruises, they  
5 all come out and want to see, what is this thing  
6 you're referring to?

7 There are some folks who come out,  
8 we've actually had universities come and look at  
9 this program, and they're listed in the ERC, get  
10 the safety reports, they're talking about the  
11 reports, talking about the event, after an hour,  
12 they'll come outside and I will ask them, so do  
13 you guys know who the FAA guy was?

14 They really don't know, because these  
15 three, unless the FAA guy is wearing a tie, you  
16 know, they like to wear ties, but you won't  
17 really know who these -- and it's not important  
18 to know. You've got three entities there. We're  
19 just going to look at safety. We're not looking  
20 at hammering somebody or running them off, we  
21 want to find safety programs.

22 MR. JENSEN: Hey, John?

1 CAPTAIN DELEEUW: Yes, sir.

2 MR. JENSEN: Leif Jensen, Sunoco  
3 Pipeline.

4 CAPTAIN DELEEUW: Yes.

5 MR. JENSEN: Backing up to one of your  
6 earlier comments, you said, when you submit the  
7 form, you send it to your operator, to your  
8 company.

9 CAPTAIN DELEEUW: Right.

10 MR. JENSEN: All right. So backing up  
11 to that slide, that kind of implies that the  
12 report's going directly to the ERC, but the  
13 company's sending it to the ERC.

14 CAPTAIN DELEEUW: Well, we -- go  
15 ahead.

16 MS. TOMAN: It goes to an analyst, and  
17 usually it's within the safety department, and so  
18 there's an analyst that will receive that report,  
19 they will de-identify that report, and then  
20 they're going to send that to those three  
21 representatives.

22 MR. JENSEN: Okay.

1 MS. TOMAN: Sometimes, you know, a  
2 reporter may not put all the information in the  
3 report, or the ERC may have questions and need  
4 more information, and in that case, we're going  
5 to go to that employee representative and let  
6 them know who submitted the report so that they  
7 can talk to them and get information, and bring  
8 it back to the ERC.

9 CAPTAIN DELEEUW: So in the oil and  
10 gas industry, like in the Gulf of Mexico, for  
11 instance, the regulator there is, well, let's  
12 see, you've got BSEE, you all heard of BSEE,  
13 you've also got OSHA, Coast Guard actually owns  
14 most of the Gulf of Mexico, so you've got  
15 regulators, you go, well, who's the actual  
16 regulator?

17 So a lot of the companies that are  
18 looking at this are not going to go and partner  
19 with the regulator yet. The regulators not ready  
20 to join in, let's say. That doesn't matter, you  
21 could still do it, because you could have a  
22 company person and an employee representative,



1 they don't have unions there, but the regulator  
2 isn't there yet, but this is what we do, so, you  
3 know, I don't work for American, not that we have  
4 our own company, but we do third parties where  
5 somebody would run this program for them.

6 So they would come in, the reports  
7 come in, because of what you said, people that  
8 are going to work on the rig, if they have to  
9 send their ASAP to something-  
10 something@chevron.com, they go, uh-uh, ain't  
11 doing that, and we know that. We absolutely know  
12 that.

13 The airline world has gotten the trust  
14 where we've gotten there in 30 years. If we had  
15 to start tomorrow, in the airline world, it'd be  
16 the same problem, because nobody would want to  
17 send the report there, but we've got the  
18 confidence built up now in our industry that they  
19 know that it's going to get sent to analyst, and  
20 they could have, quite frankly, been a union,  
21 could have been an FAA analyst.

22 It just worked out the company said,

1 we'll pay for it, just like a pizza, we'll do it.  
2 I mean, it really doesn't matter who was to be  
3 the analyst. And some airlines have actually  
4 looked at outsourcing that piece of it. Getting  
5 another company to do that for them, because that  
6 way they save some money.

7 MR. JONES: I have a question to --

8 CAPTAIN DELEEUW: Yes, sir.

9 MR. JONES: You've got an employee  
10 representative there, unions are, what, about 90  
11 percent of the working population these days.

12 CAPTAIN DELEEUW: Yes.

13 MR. JONES: So --

14 CAPTAIN DELEEUW: Actually, it's 8.7.

15 MR. JONES: -- and it's a term you  
16 just don't see anymore because there's not a lot  
17 of unions, so is there a suggestion of a  
18 replacement there?

19 CAPTAIN DELEEUW: Well, you have to  
20 have an employee representative. It doesn't have  
21 to be the unions. I mean, I'm in the airline  
22 industry and everything's unionized there.

1                   MR. JONES: Yes, I understand, but is  
2 there -- what are you seeing other folks use,  
3 lawyers, what?

4                   MS. TOMAN: Well, there's a lot of  
5 airlines that don't have a union.

6                   CAPTAIN DELEEUW: Yes.

7                   MS. TOMAN: And so they usually have  
8 some type -- some employee that kind of is, you  
9 want up here, maybe somebody from that base,  
10 wherever, if you're going to be specific with  
11 your reports on where the location is, but  
12 usually it's a volunteer position, someone that  
13 has experience, because the big thing is, you  
14 know, if there's a policy or procedure deviation,  
15 we need to know, well, yes, nobody follows that  
16 policy because it's crap, you know?

17                   Everybody at that station knows that  
18 it needs to be changed. Well, the company person  
19 not realize that or the regulator may not realize  
20 that.

21                   CAPTAIN DELEEUW: So here's what  
22 happens in the real world out there, I'll give

1 you an example, so all of you fly airplanes, what  
2 happens when the 1st Officer does the walkaround  
3 and finds the tire is low on pressure? It's  
4 flat. Okay. We all, on time machine, right? So  
5 50 years ago -- well, no, 20 years ago, when they  
6 had a janky tire, they'd say, hey, the boss would  
7 tell the AMT, aircraft maintenance technician,  
8 can you change the tire?

9           They jack it up, just like Indy 500,  
10 they get a tire on, they can have a tire on the  
11 airplane in about 10 to 15 minutes. Big old  
12 jacks. Okay. 10 or 15 minutes, but what we  
13 found over time is, when you rush like that, you  
14 make mistakes.

15           So what they've said, you know what?  
16 We're going to build a work card, a checklist, to  
17 tell you how to change a tire. It'd be like you  
18 when you teach your kid how to change a tire, you  
19 say, go in the glove compartment, get out the  
20 manual, let's do step-by-step-by-step.

21           To change a tire now on an airplane  
22 takes an hour. So we know this. But imagine

1 now, you got an airplane full of people who are  
2 going to China, and you tell the guy, hey, go  
3 change the tire, and the guy says, well, it'll be  
4 about an hour, the boss goes, are you serious?  
5 It's going to take you an hour? First mechanic  
6 says, I can do it in 20 minutes, and they'll  
7 change it in 20 minutes.

8 Bu then he makes a mistake. Who's to  
9 blame? The mechanic, the AMT? So the ERC gets  
10 this and they go, well, I don't understand why  
11 that mechanic would not follow that work card.  
12 We've been preaching it for ten years, you follow  
13 the work card. Why would you do it?

14 This guy here is going to say, well,  
15 let me tell you how it really happens on the  
16 line. We all know how to change a tire and we  
17 don't use the manual. What? You don't use the  
18 manual? The company guy will say, we spent  
19 hundreds of dollars writing new manuals for you  
20 guys, put plasticized sheets so it won't get wet.

21 But and the reality is, the whole  
22 organization has actually deviated off the norm

1 because this work group, the employees, they know  
2 how it really is. And so when you get these kind  
3 of ERCs, you can fault the guy and say, he didn't  
4 follow procedure, but then you find out that  
5 nobody's following that procedure, and that's why  
6 it's important to have some employee  
7 representation there because, you need to have --  
8 find out -- you know, got to keep it real, quite  
9 frankly.

10 And we're going to give you some  
11 examples of that.

12 MS. TOMAN: She has a question.

13 CAPTAIN DELEEUW: Oh, yes, ma'am. I'm  
14 sorry.

15 MS. BLYSTONE: Before we get too far  
16 from Haiti, we're discussing how stuffs comes out  
17 of this voluntary system and it seemed like that  
18 got picked up rather quickly from being just a  
19 one-off, we're talking about trends here a lot,  
20 but not these one-off things, how did it pick up  
21 so quickly?

22 And maybe you use that --

1                   CAPTAIN DELEEUW: No, no, so every  
2 report comes --

3                   MS. BLYSTONE: -- because this is a  
4 really good presentation. Well done.

5                   CAPTAIN DELEEUW: You make a great --  
6 this is -- it's a great segue, we'll go into it,  
7 but when Vickie started in this program, and to  
8 be fair, I ran the ASAP program for American  
9 Airlines for five years, which is a pilot ASAP,  
10 filth attendant ASAP, dispatch ASAP, maintenance  
11 ASAP, so we had four ASAP programs, starting now  
12 a ground ASAP program, actually.

13                   But when they came in, when Vickie  
14 started, she could almost run the whole thing  
15 because they got two reports, maybe, a week.

16                   MS. BLYSTONE: Oh, okay.

17                   CAPTAIN DELEEUW: Okay. At American  
18 now, and Delta, we get 1000 ASAP reports a month.  
19 We get 12,000 a year at just American. Delta,  
20 Delta gets almost 15,000 reports a year.  
21 Southwest gets the same, Alaska, Hawaiian, Jet  
22 Blue, you name it, they get -- United, same

1 thing.

2 We know all those guys and gals, we  
3 work them, so the volume of the reports is such  
4 that it's almost like a triage. So you all been  
5 talking to SMS, here's the SMS manager for  
6 American, we basically went through them, and  
7 some of them highlight right away, like, oh, we  
8 got to look at this right away, the analyst will  
9 go ahead and put it on like, kind of, a fast  
10 track.

11 If you get the ASAP report that says,  
12 you know, the lightbulbs are burned out at the  
13 VFW at the one ramp tower, okay. It's a big  
14 deal, but we'll get to that next week, and it's a  
15 very fast-paced environment a little bit when you  
16 find out. And almost every week we get a, uh-oh  
17 --

18 MS. TOMAN: We'll risk rate them --

19 MS. BLYSTONE: Yes.

20 MS. TOMAN: -- so again, the higher  
21 the risk, we're going to have to take action  
22 immediately, and that's kind of -- that's built



1       into our SMS program on how quickly you got to  
2       act on what type of risk, but then also, those  
3       reports are going to those representatives every  
4       day. They're receiving it.

5                   CAPTAIN DELEEUW: Yes.

6                   MS. TOMAN: And if any one of them see  
7       something that goes, whoa, we need to talk about  
8       this immediately, they can take action that day.

9                   MS. BLYSTONE: So that's what I was  
10      looking for is, and by the way, for the record,  
11      Kate Blystone, Pipeline Safety Trust. So that's  
12      what I was looking for is, an analyst, hello,  
13      looks at every single one.

14                  MS. TOMAN: Yes.

15                  CAPTAIN DELEEUW: And so what some  
16      companies do, they outsource that piece, because  
17      they don't want to pay for the analyst, the  
18      employees are like, I don't want to come to  
19      American Airlines or United, so they outsource  
20      it, so you have a company that will look at them,  
21      and that company then, of course -- I think it  
22      works even better because when the company looks

1 at it, they're there from 9:00 to 5:00, when you  
2 outsource it, they look at every report that  
3 comes in 24/7.

4 MS. BLYSTONE: Yes.

5 CAPTAIN DELEEUW: And so when a report  
6 comes in it's like, uh-oh, we just brought --  
7 this is a moderate risk, it's get action fairly  
8 quickly, goes back to this group here.

9 MS. BLYSTONE: Yes.

10 CAPTAIN DELEEUW: So that's kind of an  
11 important thing to know that they do look at it  
12 fairly quickly. And, you know, right here, this  
13 slide here, that we showed a little bit earlier,  
14 I got something a little later, but let me just  
15 show you right here, this is what's important and  
16 this is what ASAP's about, because Vickie's the  
17 SMS manager, and when all these reports come in,  
18 that stop sign example I gave you, that's either  
19 going to pop-up, like, here, you see how each  
20 month --

21 MS. BLYSTONE: Yes.

22 CAPTAIN DELEEUW: Yes, or each year,

1 in fact, that was the one we have, gets worse,  
2 worse, and that's -- and why don't you tell them  
3 what we do every month. We have a --

4 MS. TOMAN: So we have a data analysis  
5 meeting. And one thing, to kind of go back to  
6 ASAP, that the ERC meets once a week and it's an  
7 eight-hour meeting, and they can mark reports if  
8 they don't want to discuss them, and they have,  
9 like, canned responses for certain type of  
10 reports.

11 If it's a low risk, they can say, you  
12 know, send response 43 to this pilot, or they may  
13 say, we need to bring that pilot in because we  
14 need to find more information from that pilot,  
15 and actually do a debrief, but that meeting lasts  
16 all day long.

17 MS. BLYSTONE: Every week.

18 MS. TOMAN: Every week.

19 CAPTAIN DELEEUW: Every week. Oh,  
20 yes.

21 MS. TOMAN: And some carriers have  
22 that two days a week.

1 MS. BLYSTONE: Wow.

2 MS. TOMAN: And so this is a dedicated  
3 group that's trained and even, you know, the  
4 analyst goes through safety training, you know,  
5 in how to identify these risks. And every report  
6 that's submitted gets a response from this ERC  
7 group.

8 So there may be corrective action or  
9 it may just be a response, an email response,  
10 that goes back them. Once these reports are  
11 closed, we take that data and we have a safety  
12 data analysis meeting once a month where we look  
13 at all of the data source that comes into our SMS  
14 program.

15 So ASAP reports, we have other safety  
16 programs, and we bring all that data in and we  
17 look at it, and it's like, where are the trends  
18 at, what are the things that we need to be  
19 concerned about?

20 And then of course, it may not be a  
21 trending item, it may be one item, but because of  
22 the risk, we need to do something.

1 MS. BLYSTONE: Yes. Thank you so  
2 much.

3 CAPTAIN DELEEUW: You bet. Safety-  
4 related are volunteered by employees. So let's  
5 just make sure that we cover everything here. So  
6 I can model it -- I can follow my ASAP if I have  
7 a potential, we call it, CFR violation, or a  
8 general safety concern.

9 Now, if my boss yells at me for being  
10 late to work, I can't file an ASAP. I can file  
11 it, but it's not going to be part of the program.  
12 If there's a security issue, actually, unless  
13 it's safety, but a security issue, that's not  
14 part of ASAP. ASAP is very clear. You know, if  
15 you have work-related issues, you do something  
16 inappropriate at work, you think, oh, ASAP's got  
17 me covered, it does not.

18 So only CFR violations, potentially,  
19 and for safety concerns. And of that, in a  
20 perfect world, you get the majority of your  
21 reports are for safety reasons versus violations,  
22 right? And that's where most of the airlines are

1 now.

2 So They're all reported, like we just  
3 mentioned here, the members reach consensus on  
4 every decision, which is important to have, you  
5 know, non-punitive corrective action, so if I go  
6 the wrong direction holding, and I have to file  
7 an ASAP report, so I said I went left in holding,  
8 I should have gone right, because we don't really  
9 hold much anymore, actually, I do that, and they  
10 go -- I go to the ERC, and I put my report in,  
11 and they might want to even talk to me, which is  
12 fine, so that's a telephone interview, sometimes  
13 it's, you get brought in and talk to the ERC, but  
14 at the end of the day, they go, well, you know,  
15 John, you went the wrong direction in holding,  
16 and when you should know better, you've been an  
17 experienced pilot, and I go, I just made a  
18 mistake.

19 They may tell me to go to the  
20 simulator for an hour. And I got to go to the  
21 simulator and I got to go holding for an hour.  
22 When I'm done, I'll be the best holder at

1 American, right?

2 But they want to make sure I don't  
3 make that mistake again, because what's the value  
4 of the program to the corporation if you tell  
5 somebody you did something wrong and then they do  
6 it again next week, right?

7 MS. TOMAN: Right. It's not a get out  
8 of jail free card.

9 CAPTAIN DELEEUW: No.

10 MS. TOMAN: So they are held  
11 accountable and also, you know, the training that  
12 they may suggest an employee does, that's non-  
13 punitive as well. It's not going to go in your  
14 training file, your boss isn't going to know, oh,  
15 my gosh, John had to go into the sim for a  
16 holding pattern, you know, training, so it's all  
17 kept confidential.

18 CAPTAIN DELEEUW: This is important,  
19 so I told you, we work together at American,  
20 American is the largest airline in the world, we  
21 have 15,000 pilots, 1000 airplanes, and for 3  
22 years, this was the entire accident investigation

1 team right here. Two of us. Because we don't  
2 have any accidents.

3 Now, we have a huge team that does  
4 ASAP because we want to prevent the accidents.  
5 That's the big key to ASAP. So you can do it.  
6 So let me give you some examples I think you'll  
7 find entertaining and helpful.

8 This is in Memphis, Tennessee, and  
9 this is what a standard instrument arrival may  
10 look at. So what do you guys think? What's the  
11 name of this arrival here? How would you call  
12 that? Remember, Memphis, Tennessee.

13 The Blues, right? Because Barbecue,  
14 Elvis, and, the blues, right? So here comes a  
15 crew, they're coming at night, and you can see  
16 this, it's not complicated necessarily to a  
17 pilot, but it's a lot of information, and here's  
18 the point, it's kind of the corner post, called  
19 Blues.

20 Cap is looking at the arrival, and the  
21 1st Officer's flying, and they're going to land  
22 to the south in Memphis. The controller says,



1 you're clear direct to blues. Here's blues. The  
2 1st Officer is looking at the approach. Look at  
3 the first point of the approach. How do you say  
4 that? Blues.

5 This is blues, this is blues, no  
6 intentional mate, the pilot's made a mistake,  
7 because guess where they went to, this blues.  
8 You know, FedEx is doing the bomb burst  
9 everywhere, we went right through the middle of a  
10 bunch of FedEx airplanes going to Memphis. Well,  
11 we did land first. I can say that.

12 The point is, we didn't have an  
13 accident, but this crew reported it very quickly,  
14 and when we talked to Southwest, they had a  
15 similar report, because the change in the chart  
16 just came out.

17 So shortly after that -- oh, by the  
18 way, Elvis still in the building, so the next  
19 approach plate that came out, which was two weeks  
20 later, they changed the name to McVey, still kept  
21 Elvis, of course, but the point is, is this was a  
22 change.

1           So if we had not done this change,  
2           some time in the next 50 years someone would  
3           probably bend some metal. See where we're going?  
4           So we go, okay, we get it now.

5           So these are the highlights. I'll let  
6           Vickie kind of go over the highlights here a  
7           minute. This is kind of what we talked about.

8           MS. TOMAN: Yes, so 24 hours  
9           requirement. You can't wait to file an ASAP  
10          report until your supervisor says, hey, John,  
11          weren't you on that flight the other day that had  
12          that error? And then you're like, oh, I got to  
13          file my ASAP report. No, you file it within 24  
14          hours of the event happening.

15          The only exception we have on that is  
16          if you're flying international, it's once you get  
17          back to the United States, you've got the 24  
18          hours to file.

19          Again, we talked about it's got to be  
20          a safety concern or a deviation from an FAR, and  
21          again, this doesn't necessarily mean that that  
22          employee had that deviation, it may be ATC made a

1 mistake, but they could still file that ASAP  
2 report.

3 We talked about de-identifying, the  
4 ERC will go in and score that report, they may  
5 want to talk to the crew member, have a debrief,  
6 they can -- we don't call it coaching and  
7 counseling, but they may coach the employee, but  
8 that could be done on the phone or in person, and  
9 then every report will be closed, and again, you  
10 may have corrective action.

11 If the ERC decides to give an employee  
12 corrective action, that employee has to complete  
13 that corrective action, satisfy the ERC with the  
14 corrective action. If they take you out to do  
15 simulator training, and you fail the simulator  
16 training, then you're going to get more training.

17 If you decide you don't want to do the  
18 corrective action, then you're no longer going to  
19 be protected under ASAP.

20 CAPTAIN DELEEUW: So you asked -- let  
21 me just say, so a pilot, why would he do this?  
22 Vickie mentioned earlier, if I was a pilot, I

1 filed the report and it's accepted by the ERC, no  
2 certificate action by the FAA, which means I lose  
3 my job if I lost that, and the company doesn't  
4 discipline me, so, I mean, why would I not file?

5 That's why we have 1000 reports a  
6 month, because every pilot makes a mistake, even  
7 if they turned the wrong direction on the  
8 taxiway, they write an ASAP right away.

9 We've got it, now, they can do it on  
10 their app so that when they're in flight, they  
11 can file their ASAP before they even landed.

12 MS. TOMAN: And one thing too is, both  
13 crew members, or if you have a crew that's a  
14 four-pilot crew, all four pilots have to submit  
15 an ASAP.

16 CAPTAIN DELEEUW: Right.

17 MS. TOMAN: It can't just be the  
18 Captain submitting it on behalf of the crew.

19 CAPTAIN DELEEUW: Yes, sir.

20 DR. WHITE: So one question about  
21 coordination, so that's a chart, right, a landing  
22 chart, or something, I guess, for the industry,

1 right?

2 CAPTAIN DELEEUW: Yes.

3 DR. WHITE: So the pilots file the  
4 ASAP report, but it's an air traffic control  
5 issue of correction. How do you coordinate that  
6 between the two entities?

7 CAPTAIN DELEEUW: Well, that's it.  
8 That's the beautiful thing. In the world of the  
9 ERC, you've got a company person, you've got a  
10 regulator, and an employer.

11 DR. WHITE: Okay.

12 CAPTAIN DELEEUW: So in this case, the  
13 union and the company, they can make the -- they  
14 can call somebody and leave a message, but the  
15 regulator can get on the phone and talk -- yes,  
16 the chart goes --

17 DR. WHITE: Okay. So there's the --

18 CAPTAIN DELEEUW: Yes.

19 DR. WHITE: So they write it to who is  
20 the appropriate party.

21 CAPTAIN DELEEUW: Yes, in your world  
22 here, and I'm being kind of general, but you

1 would want something like this, you need somebody  
2 from regulation, from PHMSA, who can affect  
3 change and when you find mistakes, they don't,  
4 you know, write a letter to somebody and three  
5 weeks later go, yes, we'll look at it. That's  
6 not appropriate. You need to have the change  
7 because if the employees don't feel that this  
8 process works, they'll go back to, once again --

9 MS. TOMAN: Not tell anything.

10 CAPTAIN DELEEUW: -- not tell  
11 anything. And if they see this and this crew  
12 that writes this report, and this came out, I  
13 guarantee you, these pilots told everybody for  
14 the next year, man, you won't believe what I got  
15 changed, because they like to brag, right?

16 MS. TOMAN: And that's part of our  
17 safety promotion too, is that, we're getting that  
18 information back out to our employees, like,  
19 these are our corrective actions that we did that  
20 we discovered through ASAP, which encourages the  
21 employees to report more as well.

22 CAPTAIN DELEEUW: Yes, that's a real

1 critical piece is to broadcast your successes,  
2 because then the people go, hey, I want to be  
3 part of this deal. Yes, sir.

4 MALE PARTICIPANT: With your  
5 broadcasting the successes and getting the  
6 information out, are you getting the information  
7 out to all the industry?

8 MS. TOMAN: Yes, so we actually have,  
9 twice a year, what we call the Asias Information  
10 Share, and that's when everybody from all the  
11 airlines, the FAA, ATC, we actually have military  
12 people come now, and we talk about the top items  
13 that's been reported in our safety programs, and  
14 ASAP, and we share lessons learned.

15 The only people that are not allowed  
16 to come to that meeting are attorneys and  
17 reporters, because everything's confidential, so  
18 if you're not going to have that confidential,  
19 you know, statement out front for everybody,  
20 nobody's going to share anything, because they  
21 don't want to show up on the news, oh, wow, look  
22 what happened to Delta.

1                   CAPTAIN DELEEUW: Yes, I think I saw  
2 that Vivek was on your list, was Vivek here  
3 yesterday?

4                   Okay. So they talk a lot about the  
5 Asias Information Share and a lot of it's a  
6 different data source. This is part -- this is  
7 the same idea, where you're sharing the ASAP  
8 data, but it's the highlight ones. I think me  
9 and Vickie have briefed at every infoshare in the  
10 last four or five years.

11                   We briefed some significant events in  
12 the industry that we discovered or that our team  
13 has, but when we first started in infoshare, it  
14 was less than 100 people. Now it's 1000 people  
15 show up, so it's a lot of people, and it's almost  
16 --

17                   MS. TOMAN: And it's a great meeting.  
18 Well, it's like usually four days, and so you'll  
19 have, like, a general meeting at the first day,  
20 but then you're going to break out into your  
21 sessions, the rest of it will be, like, flight  
22 ops will all be in this group, you'll have cabin



1 in this group, but you'll have FAA people there,  
2 you'll have labor unions there --

3 CAPTAIN DELEEUW: And that's great.  
4 This segues to this. You can see that these are  
5 other areas at ASAP, you got dispatch, you got  
6 maintenance, they call it tech ops now, so at  
7 this infoshare, they'll break out and talk about  
8 things.

9 So here's one from the cabin one,  
10 which is important, because the flight attendant  
11 shows up and there's a preflight, and you'll see  
12 this armrest, looks kind of goofy. It looks like  
13 it's a little too far forward, well, she wrote it  
14 up and told the Captain, hey, I think the armrest  
15 is wrong, and the Captain goes, we got to go.  
16 Come on. Get everybody on. Let's leave.

17 Well, she was a little upset about  
18 that, first of all, but number two, she took some  
19 pictures, filed her ASAP report, and when you do  
20 this, you go, okay, well, now we start looking  
21 at, what happened to this?

22 So get the AMT to come out, we're part

1 of all the same program, the tech ops, the ASAP  
2 manager, sends -- his folks come out there, and  
3 it turns out, these were pre-positioned in the  
4 wrong place.

5 Now, what the Captain didn't realize  
6 is that, when a flight attendant is trained, if  
7 this airplane ran off into the woods with a bunch  
8 of passengers in the middle of night, no lights  
9 onboard, flight attendant is going to find the  
10 over-wing exit.

11 She does it because she's going to  
12 find this armrest and put her hand and look for  
13 the handle here. Well, if she does it this way,  
14 there's no handle. If you look at the right way  
15 it is, put her hand here, find the handle. So  
16 was it a safety concern? You bet it was a safety  
17 -- huge safety concern.

18 So when this happens, what will we do  
19 next?

20 MS. TOMAN: So we're going to reach  
21 out to that other department, so maintenance was  
22 involved with this. Maintenance has an ASAP

1 program. So the cabin ASAP manager is going to  
2 reach out to the maintenance ASAP manager and  
3 say, hey, look what was reported on our program.  
4 Do you have any reports or can you solicit  
5 reports?

6 Again, we're not trying to get anybody  
7 in trouble, what we're wanting to look at was the  
8 documents that they use to reinstall this exit  
9 door, was it followed correctly, does it need to  
10 be fixed?

11 And so that's where we're able to all  
12 work and share the reports from each different  
13 group, maintenance, dispatch, flight, et cetera.

14 CAPTAIN DELEEUW: So we found this  
15 here, you think this was the only airplane? Of  
16 course not, right? We know this. Everybody in  
17 the just knows it. So that's the beautiful of  
18 ASAP. You start going, hey, we better go look at  
19 all the airplanes, which they did, and they found  
20 five more like that.

21 MALE PARTICIPANT: Was it a mistake  
22 that was on their step list, like, the changing

1 the tire?

2 CAPTAIN DELEEUW: It was mistake made.  
3 The root of this, which is always important, they  
4 went back to the place that puts these armrests,  
5 because people first thought, oh, I think they  
6 put it on the wrong door. No, no, they had  
7 personally put it in the wrong place. The  
8 template they used, instead of this way, it was  
9 this way, so this way, so, you know, the old  
10 thing that says, this side up, we see this a lot,  
11 okay?

12 When you don't mark things  
13 appropriately, people show up, their late,  
14 they're used to old time, turn it one time, get  
15 new one, new people involved, so this was really  
16 important to ASAP now because we got a lot of old  
17 folks who are my age who are retiring in the next  
18 ten years, and all the new kids are coming up,  
19 the Millennials, and we need to help them by  
20 being very good at how we do things and mark  
21 stuff.

22 No offense to any Millennials, by the

1 way. Look at this one here, Mobil grease. Some  
2 airlines like the big one in Dallas, might pack  
3 their own brakes; the bearings in them.

4 See how it says, Mobil aviation  
5 grease, SHC 100, I think American, you know, they  
6 go to the Costco and they buy a million of these  
7 things. Well, it ran out, they ran out, they had  
8 to order a new one.

9 Well, if you look real close, it says,  
10 Mobil aviation grease, SHC 100. Here comes the  
11 new one, Mobilith SHC 100. Hey, it's a lithium  
12 complex, it's even better. Woo-hoo. They're  
13 busy doing the brakes, and one day the mechanic's  
14 looking down, and he looks at the can, and to his  
15 amazement, it says on the can here, not for  
16 aviation use.

17 He's thinking, oh, one of my buddies  
18 probably wrote that. No, it was true, and so he  
19 files an ASAP. So he files the ASAP report and  
20 he tells his manager, of course, the whole  
21 department filed ASAP reports right away, because  
22 they all missed it, and not that they were

1 responsible 100 percent, but they're supposed to  
2 look at the label too.

3 And so with that, now we've got  
4 airplanes that have got -- running around with  
5 not for aviation use wheel bearing grease, right?  
6 So how do we solve that? Do we still keep  
7 flying?

8 MS. TOMAN: Yes.

9 CAPTAIN DELEEUW: How do we tell the  
10 FAA we keep flying?

11 MS. TOMAN: We've got to the notify  
12 the FAA.

13 CAPTAIN DELEEUW: And then do we do  
14 anything with it, like a risk analysis and --

15 MS. TOMAN: Yes, we do a risk analysis  
16 and look at it, and that's part of our SMS  
17 program, so this event's happened, we've got to  
18 look and identify what the hazards are, can they  
19 be mitigated or are we going to have to ground  
20 this fleet? And then that would be a concurrence  
21 with all the three groups.

22 CAPTAIN DELEEUW: And as it turns out,

1 it was a better grease, it just never made it to  
2 the paperwork yet, and you've all seen that,  
3 right? So here's who benefits from this, the FAA  
4 benefits, because they're -- the FAA, in the  
5 past, didn't really know what was going on, and  
6 it's impossible for the FAA, no offense to the  
7 FAA in the room, but you cannot regulate a large  
8 airline like American Airlines unless you have --  
9 you got to have ten times the amount of employees  
10 you have, so they can't really regulate much  
11 anymore, but now they're part of the process.

12 They're completely transparent,  
13 they're working for the airline, and everything  
14 that we find that's bad, they know about it.  
15 They're there with us. They're partners with us  
16 on everything that we do.

17 The airline benefits, the employee  
18 benefits, of course, they benefit, but --

19 MS. TOMAN: And you benefit the flying  
20 public.

21 CAPTAIN DELEEUW: -- right here,  
22 that's who benefits; the flying public.

1 MS. TOMAN: And, you know, when we  
2 started ASAP, we were not required to have a  
3 safety management system for airlines. So that's  
4 only -- that requirement only became effective in  
5 March for all -- 121 carriers have to have a  
6 safety management system, and that safety  
7 management system includes ASAP.

8 So you have to have the confidential  
9 reporting program, so that's where we used ASAP  
10 and we have the safety hotline that, when we  
11 first started this program, there was no SMS,  
12 nothing communicated about that, we didn't even  
13 have day talks (phonetic) yet, but that's where  
14 we get that feed for all of our employees.

15 MR. NGUYEN: But you said you had a  
16 hotline? Is that an ASAP hotline?

17 MS. TOMAN: We have to. So we have a  
18 fixed hotline, because we still have frontline  
19 employees that don't have an ASAP program, they  
20 don't have a certificate, so for them, we have  
21 the confidential reporting program, and that goes  
22 to the safety department, but then we also have



1 the ASAP hotline, because say, you know, we  
2 talked about, you got to file your report within  
3 24 hours, well, what if you live in Montana, and  
4 you don't have Internet, and you got to drive an  
5 hour to get your report submitted?

6 You can actually call and say, I'm  
7 marking the time now, I will submit the report as  
8 soon as I get to Internet.

9 CAPTAIN DELEEUW: So one thing that's  
10 important on ASAP is, and what Vickie says there  
11 is very important, because you file your ASAP  
12 report, but it's not like this. So I go up and  
13 I'm ready to go fly, and they de-ice my airplane  
14 incorrectly. They told me I'm de-iced. I taxi  
15 out, the flight attendant goes, we still got ice  
16 on the wings, Captain.

17 Go back, and look, sure enough, we've  
18 got ice still on the wing, so I was improperly  
19 de-iced. Well, I could file an ASAP report when  
20 I come home from my trip, and it might get action  
21 in a couple days, but in the meantime I'm reading  
22 the paper the next day that an airplane crashed

1 because of ice on the wings. It'd be a little  
2 tough to swallow that.

3 So we don't do that. You could file  
4 your ASAP report, but you've got to belly up to  
5 the bar pretty quick and say, hey, this plane was  
6 not properly de-iced, I filed my ASAP report, you  
7 got to still tell your boss. You got to let  
8 everybody know.

9 So like Vickie said, you can call the  
10 hotline and say, I'm filing my ASAP report, but  
11 if it's a safety of flight issue, or something,  
12 you need to tell somebody. ASAP's not your only  
13 -- you just don't file an ASAP and go home. You  
14 got to tell somebody, if it's critical, right?

15 So this is the thing that I thought  
16 might be interesting. One of the things that we  
17 have in the airline world, as you all know, is  
18 checklists, but checklists can be cumbersome,  
19 sometimes they don't seem like -- so this is the  
20 7A, some new changes because of technology, and a  
21 lot of because it's based on ASAP reports, people  
22 actually will miss items on a checklist.

1                   God, I can't believe it. Well, that's  
2 what happens. So in this airplane here, it's a  
3 lot of the electric switches are tied to the  
4 checklist. So in this case here it says,  
5 transponder has to be set. When I turn the  
6 transponder here to the TARA, the checklist  
7 closes automatically. It's called a closed-loop  
8 checklist.

9                   So as you flip electrical switches, it  
10 completes checklist items for you automatically  
11 because it knows you did it. If I was to go to  
12 the next checklist, it will tell me, you missed  
13 something. So the checklist philosophy and the  
14 way we're doing checklists, it's called an ECL,  
15 electronical checklist, basically, it's going to  
16 help safety, because these are all from ASAP  
17 reports, because you go, how could you miss a  
18 checklist item? Well, you can. Yes, go ahead.

19                   DR. BORENER: Is that considered a  
20 safety critical system? Like, did it have to go  
21 through a certification process by training?

22                   CAPTAIN DELEEUW: The Memphis one?

1 DR. BORENER: No, the --

2 CAPTAIN DELEEUW: No, no, what happens  
3 is, see, we get data.

4 MS. TOMAN: It does have to be  
5 certified by the manufacturer.

6 DR. BORENER: So it had to go through  
7 that certification process?

8 CAPTAIN DELEEUW: Yes.

9 DR. BORENER: How long did it take to  
10 get to that?

11 CAPTAIN DELEEUW: Oh, talk to our  
12 friends at Boeing, they built it, but this is --  
13 in ten years from now, this is going to be fairly  
14 standard for all airplanes being built, I'm  
15 pretty sure.

16 DR. BORENER: So now, is that  
17 reporting out data so that you could check to see  
18 how the --

19 CAPTAIN DELEEUW: You know, all  
20 civilian airplanes, it's got so many black boxes,  
21 it knows, you know, everything you do, basically,  
22 but in this case here, the reason this comes into

1       ASAP is because people would write ASAP reports,  
2       and over time, if somebody asks Vickie, hey, do  
3       you have any reports about people missing  
4       checklist items? Yes, I got boxes full.

5               MS. TOMAN: And we still have them on  
6       our older aircraft, a little paper that you just,  
7       you know, check, check, check --

8               CAPTAIN DELEEUW: And you get  
9       distracted, the flight attendant says, you want  
10      your coffee this morning? You go, oh, yes, I  
11      missed an item. You missed the item, could be  
12      critical to flight. So with that in mind, we  
13      give information, we feedback to the  
14      manufacturers, they want to hear from us, they  
15      go, hey, did you know this? They go, oh, had no  
16      idea.

17              MS. TOMAN: But we do have a FOQA  
18      program, not to get all into that, but that does  
19      report off the aircraft.

20              DR. BORENER: And that reports on to  
21      -- that's the question I had.

22              CAPTAIN DELEEUW: Yes.

1 MS. TOMAN: So that will show if  
2 there's flap overspeeds --

3 DR. BORENER: Okay.

4 MS. TOMAN: -- or, you know, certain  
5 things. We always talk about ASAP is the  
6 employee telling you what happened, where FOQA is  
7 the airplane telling you what happened, and  
8 hopefully they mirror together, but that data is  
9 reviewed in that monthly safety data meeting that  
10 I talked about earlier.

11 DR. BORENER: Okay.

12 CAPTAIN DELEEUW: So I know -- I bet  
13 he talked about FOQA, didn't he? A little bit  
14 yesterday? If he didn't, that's good, but FOQA  
15 stands Flight Operations Quality Assurance. Our  
16 friends at Southwest, they call it FDM, flight  
17 data monitoring, same idea, but that's also a  
18 voluntary program.

19 In Europe, it's a mandatory program,  
20 but in the United States, it's a voluntary  
21 program, so it's much more accepted by everybody,  
22 quite frankly, and like Vickie said, it's just

1 another part of safety assurance in the SMS  
2 world; another program. We have other programs  
3 out there too, like IEP, LOSA, stuff like that.

4 So all these items here on the  
5 checklist, they're all completed electronically.  
6 When the crew does the switches and they do them  
7 properly and correctly, that checklist item will  
8 close. That's the beautiful thing of things like  
9 ASAP. Yes, sir.

10 MR. HERETH: When you have an  
11 electronic checklist, how can the checklist let  
12 you miss an item?

13 CAPTAIN DELEEUW: It won't. That's  
14 why we've gone to this. That's what I'm saying,  
15 the ASAP reports, we go to the manufacturer and  
16 go, you know, I know you're not going to believe  
17 it, but pilots miss checklist items. Really?  
18 Yes, so the manufacturer goes, hey, you know, I  
19 got an idea. Why don't we just tie it so that  
20 every time you take the four hydraulic switches,  
21 you know, close the hydraulic pumps, they're all  
22 off.

1 MS. THEBERT: So the plane won't go if  
2 something's not checked.

3 CAPTAIN DELEEUW: You'll get a notice  
4 that it says, hey, it's almost like Siri telling  
5 you, you forgot something.

6 MS. TOMAN: But I think the good thing  
7 is, though, after, you know, over 20 years in the  
8 industry with ASAP for airlines, we're actually  
9 seeing corrective action by the manufacturers of  
10 things that we've been reporting that we had  
11 issues with. These are major safety enhancements  
12 for the whole industry.

13 CAPTAIN DELEEUW: So one thing we  
14 talked about was the Millennials, and we're also  
15 talking about older generation, but we're also  
16 talking about new technology. I guarantee you  
17 all see the same new technology we do.

18 So five years ago when I used to go to  
19 work, flying, I'd have a kit bag with me, you  
20 probably saw pilots carry them, the kit bag  
21 weighed, how much did kit bags weigh?

22 MS. TOMAN: It was like 50 --



1                   CAPTAIN DELEEUW: Fifty pounds.

2                   MS. TOMAN: -- pounds.

3                   CAPTAIN DELEEUW: Forty or fifty  
4 pounds. If you fly to China, you got to carry  
5 even manual loads, it was like 60 pounds.

6                   MS. TOMAN: And we talked about some  
7 manuals, that was our number one cause of injury  
8 to pilots, was the kit bag, because when you get  
9 in the cockpit, you got to whip it around, put it  
10 behind your seat, and they'd have shoulder  
11 injuries.

12                  CAPTAIN DELEEUW: Yes, I was on injury  
13 duty for ten years. That's why I'm doing this  
14 now. I'm just kidding you. But I mean, a lot of  
15 pilots were injured on duty doing this.

16                  So now we came up with the iPad. They  
17 started selling iPads in April of 2010. It's the  
18 fastest selling product ever for mankind, by the  
19 way, kind of a side note, but here is how we look  
20 at it on approach plate like this. And this is  
21 how we've always looked at it. And even at  
22 nighttime, we had our light up on the overhead.

1 This is how we looked at them. This was it.

2 Well, now, we have a crew that was  
3 flying to Las Vegas at night, they're flying at  
4 night, and it's Las Vegas, so if you all been  
5 ever to Las Vegas, it's the only thing out in the  
6 desert, big, bright lights, you cannot miss them,  
7 and the crew was basically clear for a visual  
8 approach. They were sitting over here and they  
9 were clear to come fly the visual approach.

10 Now, all of you can see that this is  
11 the water here, here are the mountains, it's  
12 pretty obvious, tells you peak elevation is 3300  
13 feet, 3338, actually, so you can see the  
14 mountains and the water, so they're flying to  
15 Vegas, and while flying to Vegas, they look  
16 ahead, and all of a sudden, all the lights went  
17 away.

18 So I used to fly low levels in the  
19 military, if all the lights go away, they only go  
20 away for two reasons, massive power outage, or  
21 there's a mountain between you and the lights.  
22 Las Vegas hasn't had a power outage in years,

1 because that's what makes the city glimmer at  
2 night.

3 So the crew do not recognize it and by  
4 the time they got the terrain pull up, which, we  
5 have safety features, they climbed, and hey, the  
6 lights came back, so the point is, we go, well,  
7 they filed an ASAP on this, which was good. We  
8 actually brought the crew in because we were a  
9 little concerned, started looking a little  
10 better, deep dive, and one of the questions in  
11 the investigation, they go, well, did you not see  
12 the mountain there?

13 And they said, actually, we missed the  
14 mountain. How could you do that? Well, they're  
15 Millennials, and they flew it at the nighttime  
16 mode, and look what happens when you fly the  
17 nighttime mode. The mountain goes away because  
18 they didn't build this for pilots. This is an  
19 iPad. You all have a nighttime feature on your  
20 iPad. You ever notice it before?

21 Wow, who would have known about that?  
22 So then we looked at another jet manual we have,

1 same thing, look what happens when you do that  
2 procedure, you can inverse it, so now that  
3 mountain just became a big old lake.

4 So this is not about the Millennials,  
5 I use it loosely, but a crew goes there for the  
6 first time and they made it black this way here,  
7 iPad's not going to know they changed theirs.  
8 This is it. You can see very clearly how this  
9 can be an accident in our industry in the next 30  
10 years. Very clearly.

11 I'm telling you, this is a big thing.  
12 So we can't change iPads, so we have an SMS  
13 program, ASAP came in, the crew was accepted,  
14 they didn't intentionally make a mistake, and we  
15 give it to the SMS folks, so what did we do?

16 MS. TOMAN: We put out notification  
17 immediately to all pilots that they have to,  
18 during their briefing, ensure that they're not  
19 using the nighttime mode, and for the guidance in  
20 the manuals, which, that took a little bit  
21 longer, because that was a revision, we briefed  
22 this at infoshare, we sent messages out to other

1 carriers, and then also to Jefferson, so if  
2 they're the ones that are responsible for these  
3 charts, so they can notify other companies that  
4 may be using these charts.

5 But it's important, like what John  
6 said, we talked about that kit with all those  
7 manuals, that iPad, that's all the pilots have  
8 now. So they've got, like, a little purse,  
9 nurse, that they put their little iPad in to go  
10 to work.

11 CAPTAIN DELEEUW: It's a purse. Come  
12 on.

13 MS. TOMAN: They don't have shoulder  
14 injuries anymore, but like he said, the iPad  
15 wasn't built for airlines, so this is a new  
16 technology the airlines are using, and that's  
17 where we get this information. We can't sit on  
18 it. We've got to send it out to the industry.

19 CAPTAIN DELEEUW: And I don't know if  
20 you picked up what Vickie said, the procedure  
21 change at our airline, and most airlines, when  
22 you brief the approach now, you have to brief it

1 in the daytime mode.

2 If you want to fly it this way when  
3 you actually do the approach, that's fine, but  
4 when you brief it, you have to brief it in the  
5 daytime mode, because otherwise you will miss the  
6 granularity of the technical stuff that's there,  
7 so that was a big change there. Good change for  
8 us.

9 So couple things, because nobody's  
10 asked me the question yet, because everybody gets  
11 accepted, right? Not so fast. So they have to  
12 be in 24 hours, as Vickie mentioned, you can't  
13 just wait until the FAA sends you a notice three  
14 weeks later. That's a little late. Doesn't work  
15 that way. Violations have to be inadvertent and  
16 not a potential disregard for safety.

17 So, Vickie, tell us on what we call  
18 the big five.

19 MS. TOMAN: So the big five, you can't  
20 have drugs involved, substance abuse, you can't  
21 lie, you can't intentionally, you know, go  
22 against a procedure or violation, because you're

1 not going to be (inaudible).

2 CAPTAIN DELEEUW: Right. So  
3 substance, alcohol, drug use --

4 MS. TOMAN: Falsification, lying on  
5 your report.

6 CAPTAIN DELEEUW: Right. We don't get  
7 many of those, actually, in the airline industry,  
8 believe it or not, they're out there still, I get  
9 it, but that just isn't really -- I cannot tell  
10 you the last time that somebody was excluded from  
11 ASAP for those three items; drugs, alcohol,  
12 substance abuse. That just really doesn't  
13 happen, because we're subject to random drug  
14 testing, just like you folks are in the pipeline  
15 industry. Doesn't happen much.

16 Lying, don't get too much lying,  
17 because people know, you lie, you're done, so  
18 might as well tell us the truth, because we want  
19 to know everything, warts and all.

20 The last one is, intentional disregard  
21 for safety, and that's kind of a big deal.

22 MS. TOMAN: It can be tricky too.

1                   CAPTAIN DELEEUW: That's tricky,  
2                   because what's intentional disregard for safety?  
3                   So the mechanic story I gave you, did he  
4                   intentionally disregard safety by not following a  
5                   work chart? Yes, he kind of did, but that's  
6                   where the ERC talks about it, and that's where  
7                   you get a, you know, let's keep it real, that's  
8                   what everybody's doing, so now we have to fix the  
9                   system, not so much that individual mechanic.

10                   And that's where you really get your  
11                   good safety lessons from. That is a really big  
12                   thing there. So, you know, it can't be  
13                   inadvertent, like I mentioned, they're accepted  
14                   in here, and the employee doesn't complete the  
15                   corrective actions.

16                   Vickie mentioned earlier, you go in  
17                   the holding and I can't hold, and they go, okay,  
18                   you go to the simulator again. I still can't  
19                   hold. If I can't complete the corrective  
20                   actions, I'm not accepted.

21                   MS. TOMAN: If you're not accepted,  
22                   then you get -- you can open up for company



1 discipline, the company can investigate the  
2 event, discipline the employee. If it's non-sole  
3 source, the FAA is aware of it, they can  
4 discipline the employee. They can go after  
5 certificate action.

6 So it's a big thing that if you file  
7 this ASAP, you want to make sure you get  
8 accepted.

9 CAPTAIN DELEEUW: And it remains  
10 confidential, so if a pilot or a mechanic, or any  
11 of the four workgroups, file an ASAP and they  
12 were excluded, doesn't mean they get fired right  
13 away, a lot of times they're not, they're just  
14 excluded. They just don't get the protections  
15 that ASAP gave them.

16 So that ASAP confidential report, the  
17 company, the union, they don't get that report.  
18 If that report's excluded, that ASAP, they shred  
19 the ASAP and the company, or the FAA, has to do  
20 their own independent investigation. We don't  
21 give them, here's what we found out. That's not  
22 -- but that so rarely happens.

1           I think last year, at American, it's  
2           typical most airlines, there might have been five  
3           exclusions of pilots, and none of those guys were  
4           terminated, or gals, they just -- they were  
5           excluded because of other extenuating  
6           circumstances, typically.

7           MS. THEBERT: But, I guess, privacy-  
8           wise, like, if you were on the simulator,  
9           someone's going to know you messed up or do you  
10          go regularly?

11          CAPTAIN DELEEUW: Well, we do, but we  
12          kind of do that.

13          MS. TOMAN: Like, in corrective action  
14          --

15          MS. THEBERT: Right.

16          MS. TOMAN: -- we have what we call a  
17          check airman, who does the simulator training,  
18          they have an agreement that they have to sign  
19          with the ASAP ERC that they will maintain the  
20          confidentiality.

21          MS. THEBERT: Okay. So you could be  
22          there for corrective action or you're just there

1 to do --

2 CAPTAIN DELEEUW: Yes, if people don't  
3 see you go on the sim, they wouldn't necessarily  
4 know if you were on the sim for training or for  
5 corrective action, and we don't have that many.

6 MS. TOMAN: It doesn't go in your  
7 training record or anything like that.

8 CAPTAIN DELEEUW: Right.

9 MS. THEBERT: Okay.

10 CAPTAIN DELEEUW: And for the  
11 maintenance world, sometimes it's as simple as,  
12 okay, this mechanic made a mistake and now he has  
13 to brief it at the next meeting of the mechanics.  
14 When they're having pizza and beer and he's got  
15 to go standup and, you know, confess his sins.  
16 That's pretty successful too.

17 MS. TOMAN: I think one of my favorite  
18 ones, and this was actually an infoshare for a  
19 ground ASAP program, one of the employees loaded  
20 hazmat in a cargo compartment that also had a dog  
21 in it, which is a big no-no, of course, the dog  
22 was okay, nothing happened, but the ERC made that

1 employee go volunteer at a local animal shelter  
2 for, like, two days and come back and show that  
3 they did to accept that as corrective. We  
4 thought that was pretty cool.

5 CAPTAIN DELEEUW: Yes, it's kind of  
6 like Judge Wapner, you know, they have some  
7 strange ways of making you pay for your sins, I  
8 guess.

9 So now, one thing I want to tell you  
10 too is that, each one of these that we get is  
11 really good. So one of the things that we  
12 briefed at infoshare two years ago was, we had  
13 two mechanics working on a triple 7 at the  
14 maintenance facility at Chicago.

15 They fixed what they had to do, it's  
16 pretty simple, and now, in a lot of airlines, the  
17 AMTs, the mechanics, can actually taxi airplanes.  
18 They don't fly them, but they can taxi them. So  
19 if they have -- they're not going to call a  
20 pilot, you know, taxi the airplane from the  
21 hangar to the terminal, but we can get mechanics  
22 to do it. They're trained in it. Everything's

1 fine.

2           These two mechanics get down on the  
3 deck, get in this triple 7, they're going to taxi  
4 it to the hangar -- I mean, from the hangar to  
5 the terminal, beautiful, clear day. Not a cloud  
6 in the sky. They taxi out, they don't maybe 50  
7 feet and they hit an engine stand that was  
8 sitting on the right-hand side of the airplane.

9           So they hit this engine stand. It's  
10 like, we got the video, right? There's a video  
11 of everything anywhere in the world now. You got  
12 the video and you look at the video and go, these  
13 guys, they need drug and alcohol testing, because  
14 how could you miss this engine stand?

15           So they came in there, the ERC was  
16 meeting, and, you know, they were kind of  
17 debating, and just, they couldn't get their hands  
18 wrapped around this thing.

19           Well, my background as a pilot, and I  
20 went to talk to the guy, because he worked for  
21 me, the tech ops guy, and he's telling me the  
22 story, and I said, well, were they wearing

1 sunglasses?

2 I don't know. I'll find out. Well,  
3 if they wore sunglasses, have them send them  
4 back. They both wore sunglasses. Does anybody  
5 know why that's a big deal? If you have  
6 polarized sunglasses, you cannot look at a  
7 cockpit window, because the cockpit windows are  
8 polarized.

9 Now, you'll still look through it, but  
10 you'll have blindspots. And people that are  
11 pilots, from the first day of pilot training,  
12 they tell you, don't wear polarized sunglasses.  
13 But we never told the mechanics this.

14 MS. TOMAN: And there's actually an  
15 FAA alert for the pilots stating, you cannot wear  
16 those, because also, the instrument panel, if you  
17 look at the instrument panel, things blank out on  
18 it, or change colors.

19 CAPTAIN DELEEUW: Yes. We have some  
20 great -- we did a similar -- I'll tell, it's  
21 probably one of the better briefings ever given  
22 there, not because I gave it, but because this

1 was a thing that every mechanic there goes, wow,  
2 I had no idea. We had one mechanic come up to me  
3 and goes, it makes sense to me. When I ride my  
4 motorcycle with the big glare shield upfront, I  
5 noticed I was missing things because I was  
6 wearing my polarized sunglasses, because it's the  
7 same thing if you got a big shield in front of  
8 your motorcycle.

9 So this was a really big alert item  
10 and that got sent to the entire industry, and  
11 that's all because these two mechanics, who  
12 looked like they were being clowns, they actually  
13 just didn't see the stand, because some  
14 airplanes, you actually have -- I mean, you  
15 actually will have blindspots; you cannot see out  
16 the window.

17 So that's why we don't wear polarized  
18 glasses.

19 MS. THEBERT: When you say, industry,  
20 do you mean, like, worldwide or just --

21 CAPTAIN DELEEUW: Pretty much, U.S.,  
22 I mean, actually, we do -- there are ways that

1 the international community finds out, but it's  
2 more -- it doesn't always get disseminated  
3 international.

4 MS. THEBERT: Okay.

5 CAPTAIN DELEEUW: We're not there yet.  
6 Some day we will, but, you know, we share, in our  
7 industry in the United States, safety's not a  
8 secret, so we share quite readily. Other  
9 carriers, particularly South America, it's not a  
10 voluntary program, it's a required program, and  
11 they can fire you.

12 MS. THEBERT: So what if you're  
13 landing in America, wouldn't you think they'd  
14 have to --

15 CAPTAIN DELEEUW: No, if they have a  
16 program, like, when we go to China, and I make a  
17 mistake in China, I may have an ASAP coverage for  
18 the U.S. for my certificate and the company, but  
19 the Chinese Government can still say, hey, we  
20 want to talk to you.

21 MS. TOMAN: Because you have a  
22 different regulatory authority.



1 CAPTAIN DELEEUW: Right.

2 MS. TOMAN: So our program is, we have  
3 a memorandum of understanding signed with the  
4 FAA, so, you know, if you go to China, they're  
5 not going to really care, oh, yes, hey, I have  
6 ASAP.

7 CAPTAIN DELEEUW: They go, good, as  
8 they take you to jail. You tell them, I got an  
9 ASAP.

10 MS. THEBERT: You can go to jail over  
11 there?

12 CAPTAIN DELEEUW: Oh, yes.

13 MS. THEBERT: Oh.

14 CAPTAIN DELEEUW: There's a lot of  
15 places, it's called criminalization of pilots.  
16 If you have an accident, you go to jail. In  
17 Brazil, if you get an accident, you go to jail.  
18 Most of the places, the police do the  
19 investigation, and they're police officers, so  
20 you go to jail.

21 MS. THEBERT: I would just fly  
22 national --

1                   CAPTAIN DELEEUW: You just stay in the  
2 United States. Don't be going out of the  
3 country.

4                   MR. NGUYEN: Real quick, with that  
5 example, is that protocol to drug test, that  
6 example that you --

7                   CAPTAIN DELEEUW: Yes.

8                   MR. NGUYEN: So they have to drug test  
9 them.

10                  CAPTAIN DELEEUW: Well, each airline's  
11 different, but generally, in the business, and  
12 actually, a lot of this is DOT testing, just so  
13 you know, it's driven by the DOT, but most  
14 airlines have one, but usually if there's  
15 aircraft damage in any way, they usually will do  
16 a drug and alcohol test, and --

17                  MS. TOMAN: Except that the actual  
18 damage, it would count as an accident.

19                  CAPTAIN DELEEUW: Right.

20                  MS. TOMAN: So there's, like, specific  
21 rules.

22                  CAPTAIN DELEEUW: But we have specific

1 DOT rules for drug testing, and we also have  
2 specific company rules for testing, and sometimes  
3 they don't always marry up, and the company, most  
4 companies, you damage their airplane, you bend  
5 metal, you're going to get a drug and alcohol  
6 test.

7 But pilots don't care because they pay  
8 them to do it. They go, ah, I get paid to do it.  
9 I'm just saying, it's not that big of a deal.

10 So since 2009, because everybody has  
11 to ask, this ASAP program you're spending money  
12 on, does this thing really work? Unfortunately,  
13 we all know the one passenger who recently passed  
14 away, that's with another carrier, but since  
15 2009, we've had no passenger fatalities.

16 We fly millions and millions of  
17 flights a year in the United States, and in the  
18 United States, there's only been Asiana, and  
19 there was a UPS crash, but no passenger  
20 fatalities. So we've really made the change, and  
21 I give a huge amount of credit to the ASAP  
22 program, because we're fixing things before they

1       become accidents.

2                       So I want to put that out there, but  
3       you all do a little SMS, I'm not going to do SMS  
4       training, but Vickie will tell you, this ASAP  
5       program, where does it fit in this world of SMS?

6                       MS. TOMAN: It actually fits in two  
7       places. Mainly it's our safety assurance. Are  
8       the policies and procedures that we're putting  
9       out for our employees to follow, are they  
10      working? Because if they're not working, I can  
11      guarantee you, we're going to find out in ASAP,  
12      because that's where the reports are going to be  
13      coming through.

14                      But also, as we talked about, if  
15      there's a safety concern that an employee has,  
16      they can file an ASAP, and that's where our  
17      safety risk management, that's going to be  
18      identifying new hazards in the system that we're  
19      not aware of, similar to that jet card, the  
20      blues, that was something that we weren't aware  
21      of.

22                      And then the safety promotion, that's

1 another big part of ASAP is, if an employee takes  
2 the time to submit a concern to you, you've got  
3 to answer that report, but then also, you got to  
4 let everybody know what's going on. We have,  
5 like, a safety preflight newsletter that we put  
6 out every month that has all the closed de-  
7 identified reports.

8 If it's an open report, you can't put  
9 it in there, but if it's closed, we put it in  
10 there, and that goes to all the employees.

11 CAPTAIN DELEEUW: Because I love why  
12 you say that, because pilots don't like to make  
13 change. And so Vickie puts out the promotion to  
14 tell them why we're making the change, because if  
15 you don't tell people why you're making the  
16 change, they think, oh, Vickie, she's got another  
17 idea in her head. No, no.

18 They got to tell us why we're making  
19 the change. That's important. So I always like  
20 to put this up, you know, each year, I change it,  
21 you know, 2017, by the way, was the safest year  
22 in history for passengers, because the ASAP

1 concept is spreading through the world.

2           They all kind of get it, you start --  
3 if you want to start hammering and thumping  
4 employees for reporting mistakes they might have  
5 made that are inadvertent, they're not going to  
6 tell you anything. It's just, they won't tell  
7 you. And it's just like kids, right? Dad and  
8 mom don't know I broke it, maybe they won't find  
9 out who did it, and that's what happens.

10           So this is the aviation safety action  
11 program. It's starting to get -- it's really  
12 starting to go into the petroleum industry, we're  
13 calling it the petroleum safety action program,  
14 but, you know what? Maybe one of these days  
15 we'll have a pipeline safety action program,  
16 because it would work in your industry.

17           It's the same type of industry.  
18 Hazards, competent employees, people that are  
19 subject -- they know they got a certificate or at  
20 least they're subject to drug and alcohol  
21 testing, so we got to thank you for your  
22 attention and now it's time for questions and I

1 will leave this up. You can take a picture,  
2 obviously, and if you need to call us, or work,  
3 just send me -- you know, it's Christie here, but  
4 one thing is, this report, like, Christie asked,  
5 can I have your presentation, I will have some of  
6 the presentation for you, but some I can't,  
7 because I told you, it's a confidential program.

8           So all the examples I gave you, those  
9 are confidential, so I can't give those to you,  
10 but you got the benefit of listening to them, and  
11 I'll be glad to tell, or call Vickie, but that --  
12 this is what we do.

13           And I'll leave you one last thing,  
14 there was a report that came in, me and Vickie  
15 both also teach, ironically, at the University of  
16 Southern California, we teach in the aviation  
17 safety department there, so it's kind of a  
18 prestigious place to get a certificate in safety,  
19 and the example we always bring up, takes an hour  
20 to go through it, so I won't do that now, but we  
21 had a crew make a report about an issue, about a  
22 performance issue on a 73 leaving St. Croix.

1                   And the reason that the performance  
2 was there was because the airplane had input in  
3 the data, because we do it -- download it, and  
4 instead of being 28 degrees, it got inputted as -  
5 28 degrees.

6                   So the airplane thinks it's minus 28  
7 degrees, and so the throttle won't go up as far,  
8 they roll down the runway, and they get airborne,  
9 and the trees are, like, really big. Okay.

10                  So what happens, we do this big deep  
11 dive, talk to Boeing, went through it, we found  
12 out some system issues in the industry, but at  
13 the end of the day what really surprised us was,  
14 a modern airplane like that, if you put in minus  
15 28 degrees, are you telling me the airplane  
16 doesn't got, no, it's 28 degree, John.

17                  Every airplane in the world that  
18 Boeing makes, the new ones, it does that. If I  
19 put the wrong temperature in, and the outside  
20 temperature is different, you get a little alert  
21 that says, hey, check the temperature, dude.  
22 It's not right.



1           The 73's been around a long time, so  
2           that technology was never put in the 73, and so  
3           what happened, this one event we had, we had this  
4           thing that's important, so we talked to Boeing  
5           about it, and Boeing goes, yes, wow, that --  
6           well, let's see if that's a big deal. Well, they  
7           came back and said, yes, that's a big deal. We  
8           get it now.

9           So we briefed it at Infoshare and  
10          after Infoshare, we briefed it, we said, you  
11          know, if any other operators have seen this  
12          before, why don't you come forward and tell us?  
13          And it was like, you know, Baptist church with  
14          altar call. Everybody jumped right up.

15          So we got it forwarded, Boeing  
16          recognized it, so Boeing does two things, they  
17          sent out a safety alert to 178 operators in the  
18          world, with the minus 28 degree example, which  
19          was an ASAP report from one of the pilots that we  
20          know, and then they made a technological change  
21          to their airplane.

22          So one ASAP report made a change to

1 every airline in the world, a notice of it, and  
2 they're changing new airplanes. So the new 73s  
3 that come out have this technology so it will  
4 change your temperature if you put the wrong one  
5 in. There's a lot of history behind it, but  
6 that's kind of our ASAP, you know, the best of  
7 the best, I guess. Yes, ma'am.

8 MS. BLYSTONE: Kate Blystone, HHS --

9 CAPTAIN DELEEUW: Oh, yes, I heard you  
10 before. We were warned.

11 MS. BLYSTONE: Good grief. That was,  
12 like, the most exciting thing we've heard in the  
13 last year and a half. Thank you so much.

14 CAPTAIN DELEEUW: Are you being  
15 serious?

16 MS. BLYSTONE: I'm both more terrified  
17 and more excited about flying than I was before,  
18 so --

19 CAPTAIN DELEEUW: You should be.

20 MS. BLYSTONE: Yes, this is a good  
21 thing. So one of the things that we've discussed  
22 a little bit is some sort of public interface and

1 it seems like the only public aspect of this that  
2 I've seen is at the very end when you showed that  
3 2017 was the best year ever. Yes, that one.

4 CAPTAIN DELEEUW: Yes.

5 MS. BLYSTONE: Is there anything else  
6 that you do? I mean, did I miss it?

7 CAPTAIN DELEEUW: No.

8 MS. BLYSTONE: It's really a high-  
9 energy presentation and it's easy to like lose  
10 the thread a little bit, but it was amazing. Is  
11 there something that you do to kind of let the  
12 public know that, we have this awesome program  
13 and it leads to this?

14 CAPTAIN DELEEUW: You know, we don't  
15 really, it's not because we don't want to, but  
16 you know, when Vickie started ASAP, there was  
17 posters put up at all the airlines, hey, if you  
18 find a general safety concern, file an ASAP.

19 MS. BLYSTONE: Right.

20 CAPTAIN DELEEUW: Do that stuff. You  
21 go on the airlines now, there's no posters for  
22 ASAP because business is good. You know, we

1 don't need to advertise it, but --

2 MS. TOMAN: In the DOT, you know, they  
3 put out the rankings of all the airlines, and on  
4 time, safety records, so I mean, that may not  
5 necessarily point that that airline has an ASAP  
6 program, but they -- you know, the public is  
7 looking at the safety, you know, reputation of  
8 each one of those airlines, but we really don't.

9 We have, a lot of times, we'll have,  
10 like, our insurance groups will come in and we'll  
11 give a presentation showing how our safety  
12 program's, you know, corrective action, safety  
13 enhancements that we've done, but that's --

14 CAPTAIN DELEEUW: But you have a  
15 point, because after -- this has almost been  
16 around for 30 years. It'll be 27 years. There's  
17 a reason why the last two, three years, people  
18 are calling on, hey, like, a couple of large oil  
19 manufacturers in the Gulf of Mexico go, can we  
20 kind of observe what you all are doing? Because  
21 it sounds pretty interesting.

22 This is why the medical goes --

1 medical world's going, I wonder if we can do that  
2 because we have a lot of debts in the industry in  
3 medical. It's only 300,000 people a year are  
4 killed accidentally in the hospitals. Only. And  
5 that's the low end.

6 And those are mistakes that are, many  
7 times, may have been prevented, but we're not re-  
8 learning the lessons and keep making the same  
9 mistakes, so we don't want to do that in our  
10 world, because if we crash an airplane, you might  
11 survive it, you do two, your airlines gone.

12 MS. BLYSTONE: So a follow-up on that  
13 question, is there any way that the public can  
14 give you an ASAP? So, like, if they see  
15 something weird on a place, like, I don't know.

16 MS. TOMAN: Yes, they can call the FAA  
17 hotline --

18 MS. BLYSTONE: Yes, so that's --

19 MS. TOMAN: -- and they can also call  
20 the company.

21 MS. BLYSTONE: Okay.

22 MS. TOMAN: And we have a hotline

1 where they can call and that group will reach out  
2 directly to the operating department to get  
3 information.

4 CAPTAIN DELEEUW: But the thing about  
5 is, though, and this is why this program works,  
6 you're right, the public can see something, maybe  
7 the manager can see something, but the people who  
8 know what's wrong are the employees themselves.  
9 They know the mistake they made, they usually  
10 know why they made the mistake, maybe they're  
11 being rushed, maybe they said, this was written  
12 wrong, we see that every week.

13 In the maintenance world, if the  
14 diagram and instructions are written incorrectly  
15 and poorly, somebody's going to make a mistake  
16 someday, and we can't afford those mistakes.

17 So I used to tell the mechanics,  
18 there'd be a meeting of 100 mechanics, hey,  
19 listen, any of you guys file an ASAP reports?  
20 No. Okay. How many of you guys know of a work  
21 card, a policy, a procedure, or instructions that  
22 you follow that are wrong? Because mechanics are

1 smart. They know how to do a workaround. Don't  
2 work, we got another way to do it.

3 And they all raise their hand. I  
4 said, well, if you all just give me one ASAP a  
5 year, we get 25,000 ASAPs next year. You keep  
6 your company so busy, they won't know what to do,  
7 right? I mean, that's the reality.

8 So in your world, you have a lot of  
9 people who probably work remotely and  
10 independently, out by themselves in the middle  
11 of, you know? I looked at this picture this  
12 morning, and, you know, in the middle of,  
13 probably, the Tundra somewhere, right?

14 So like this, you make a mistake, you  
15 want that employee who made a mistake out here  
16 where nobody saw it, you want him to feel free,  
17 like, I'm going to make a report, because if he  
18 writes that report, you're going to find that  
19 other people will start making reports, and you -  
20 - to Vickie's point about the promotion, you tell  
21 them why you made the change, you get buy-in  
22 pretty quick, and next thing you know, you won't

1 be advertising ASAP, because they're going to  
2 give you the reports, particularly if they get  
3 protection.

4 MS. BLYSTONE: Thank you so much.

5 CAPTAIN DELEEUW: I hope that -- yes,  
6 sir.

7 MR. HERETH: Do you put -- do  
8 maintenance reports go into this process or can  
9 they go into this process?

10 MS. TOMAN: Maintenance reports as far  
11 as the ASAP reports from the mechanics?

12 MR. HERETH: Yes.

13 MS. TOMAN: Yes, it's all in the same.  
14 The way we've described the system, it's run the  
15 same way for the flight attendants, for the  
16 mechanics, for our dispatchers, those are all our  
17 certified workgroups. Some people also have a  
18 ground ASAP program. The FAA, we used to, you  
19 know, send reports all the time to ATC, it's  
20 like, hey, what's going on with this controller,  
21 the way they gave this direction to the pilot.

22 So there's now an ACSAP program, so



1 the controllers also have an ASAP program, and we  
2 work with them a lot because if it's recorded in  
3 a flight ASAP report, chances are if it's dealing  
4 with ATC, they're probably going to have an  
5 ACSAP, so we can work together and get both sides  
6 of the story.

7 CAPTAIN DELEEUW: Yes. And let me  
8 make some -- so you know, sometimes I don't  
9 always say this because I just think it's  
10 obvious, but it's obvious to me, probably, but  
11 that tech ops ASAP, the company guy is an AMT.  
12 The union guy is an AMT. The FAA guy, he's not a  
13 pilot, he's an FAA maintenance guy.

14 So there's no pilots or flight  
15 attendants involved in that whole process. It's  
16 a mechanic's world and you couldn't --

17 MS. TOMAN: And that's an important  
18 part, because when we first started ASAP 25 years  
19 ago, you would have the pilot, FAA guy, or maybe  
20 even from the company think that they would  
21 manage all the ASAP programs, and you can't do  
22 that. You've got to have people that have the

1 experience to be in that group.

2 MR. HERETH: So actually -- well --

3 CAPTAIN DELEEUW: Go ahead.

4 MR. HERETH: So why wouldn't you have  
5 a pilot involved in that program?

6 CAPTAIN DELEEUW: Well, I can tell you  
7 why. If I'm going to be judged on the report I  
8 flew, on a descent from China, and I missed the  
9 final approach, 6200 feet, because EGBWS was  
10 going off, you think the mechanic's going to be  
11 able to say, yes, that was dumb.

12 MR. HERETH: I understand that.

13 CAPTAIN DELEEUW: Yes, so but the  
14 mechanic wouldn't want a pilot judging him  
15 because I don't go out and turn wrenches, and I  
16 go --

17 MS. TOMAN: But yet, we share -- so in  
18 those ASAP managers, they all -- they're not in  
19 different buildings, different locations, they  
20 all set in the same row. Their offices are in a  
21 line. So if it's going to involve another  
22 operational group that has an ASAP, you have to

1 share that ASAP with them.

2 MR. HERETH: Yes, actually, my  
3 question was a little bit different concept.

4 MS. TOMAN: Oh, okay.

5 MR. HERETH: So it's a maintenance-  
6 related event, if it's all maintenance people,  
7 don't you have a confirmation bias; a tendency  
8 towards confirmation bias? Why wouldn't you have  
9 pilots? Why wouldn't you have people who are  
10 users of the equipment involved in that process?

11 CAPTAIN DELEEUW: Well, you could, in  
12 a perfect world, and get some input, but, you  
13 know, then they'd say, well, why do we have a  
14 flight attendant as being part of that to that,  
15 and they --

16 MR. HERETH: I guess I would suggest  
17 you should have a customer.

18 CAPTAIN DELEEUW: Well, you could, but  
19 you're talking about, most of the ASAP reports  
20 that come in there from the maintenance world are  
21 actually fairly technical, and I do sit through  
22 them. I actually sat through a tech ops ERC

1 about three, four weeks ago, and I was -- learned  
2 a lot. I'm always -- I learned a tremendous  
3 amount.

4 But, you know, it's really, I know  
5 this doesn't seem fair, but it's really not my  
6 wheelhouse, and I don't really get in there much,  
7 now, if there's something that comes out of that  
8 ERC that's appropriate for the pilots to know,  
9 you bet. That does get communicated, but I get  
10 your point, and maybe in 30 years we'll be there,  
11 but we're not quite there yet.

12 We keep evolving, so Vickie made a  
13 point that I don't know was caught by everybody,  
14 we used to have ASAP managers for the different  
15 programs at different locations. We finally  
16 figured out one day, you know what? This is not  
17 pretty bright. So we actually, when I was there,  
18 we put all four ASAP managers in cubicles or  
19 offices right next to each other, so instead of  
20 making a phone call, you know how that is, or an  
21 email, they walked out their door and go, hey,  
22 did you know about this here? It really improved

1 the communication process. Yes, sir.

2 MR. COTE: Two questions related.

3 Number one, does all of the ASAP flow directly  
4 into the Asias program or are those two separate  
5 programs, and if so, what is the division?

6 MS. TOMAN: So that does -- for it to  
7 flow into Asias, that's got to be an agreement  
8 between the company and the pilots. And so some  
9 airlines may feed some information in there, but  
10 again, those are going to be closed reports.  
11 Once the ERC has done their thing, the company  
12 has done their thing, all the corrective actions  
13 have been done, there's an agreement that they  
14 can dump that data in there.

15 And so I --

16 CAPTAIN DELEEUW: We all do, but  
17 here's the thing, and this is something, so for  
18 American Airlines and Delta, for instance, they  
19 get 12,000 ASAP reports. They get all the  
20 reports and we have such a high statistical  
21 sample that if there's a trend developing, we can  
22 probably figure it out just on our own.

1                   But then you've got, let's say, Sun  
2 Country, who's got three airplanes, they don't  
3 have enough data coming in to know what it is.  
4 So they benefit more out of Asias, probably, than  
5 the major airlines. Now, the major airlines are  
6 contributing to it because they're part of the  
7 safety system, but if American Airlines was to  
8 pull out of Asias, the dataset's so large that  
9 the trends are still going to be identified,  
10 regardless whether we're in it or not.

11                   So that's a great question to ask,  
12 but, you know, the Asias thing, it's got to start  
13 somewhere. Now there's 43 airlines, I believe,  
14 or entities, that feed into Asias, so, you know,  
15 the numbers are staggering. The question is --

16                   MS. TOMAN: It's a great data source  
17 for information.

18                   CAPTAIN DELEEUW: It is.

19                   MS. TOMAN: Especially if you think  
20 you see something trending in your airline, you  
21 can look at that and say, oh, hey --

22                   CAPTAIN DELEEUW: But see, we learned

1 the lesson the hard way. That's why, if you all  
2 were to start this tomorrow, you're going to want  
3 to hire us, and I'll tell you why, because you  
4 learn things the hard way. So that example you  
5 had, so what if you decide and said, I've got  
6 access to Asias, that's pretty cool, let me see  
7 what kind of -- let's see what approaches we have  
8 at Memphis from midnight to 5:00 in the morning,  
9 who are you checking? FedEx, right?

10 What if we said, we want to see all  
11 the unstable approaches at Love Field in Dallas.  
12 We all know that's Southwest, right? We have the  
13 rule of three. Has to be three carriers,  
14 basically, the same operation, because we don't  
15 want anybody, including the FAA, not to even be  
16 tempted to find out, because they can't.

17 We have the rule of threes, and that's  
18 what Asias will manage. So if you're going to  
19 play the game, which you are, there are certain  
20 caveats and rules you have to follow. That's a  
21 whole other discussion, but that's where I'm kind  
22 of getting on that. Okay. Yes.

1 MR. COTE: I understand. Thank you.

2 CAPTAIN DELEEUW: Yes, sir. Go ahead.

3 MALE PARTICIPANT: Your safety  
4 management system, you had touched on that, how  
5 does that all tie-in with this and is it the same  
6 safety management system throughout the industry  
7 or do you guys have your own?

8 MS. TOMAN: Well, each person can kind  
9 of tailor it different for their airline, but we  
10 have the -- well, originally, it was advisory  
11 circular, but Part 5, the final rule that came  
12 out from the FAA, that's all the four pillars and  
13 then they added the documentation and record  
14 keeping at the end, but we all have to make  
15 commitments within this.

16 But most airlines, for that  
17 confidential reporting piece, that's where  
18 they're looking at ASAP or a confidential hotline  
19 to get that information.

20 And most airlines, we already had this  
21 process in place, we just didn't really have it  
22 documented on how we did it. But the ASAP, that



1 identifies hazards, that's our safety assurance,  
2 is things that we're doing. When we make a new  
3 policy or procedure change, we go through a risk  
4 management process where we identify what  
5 potential hazards could be there, that, if we  
6 make this change, but then also for monitoring,  
7 after we've made that change, that's where we  
8 rely on all that safety data coming in, because  
9 we'll look at that for maybe six months and say,  
10 okay, we made this huge procedure change on an  
11 aircraft, we want to see, are we getting ASAP  
12 reports on that? Are we getting the FOQA  
13 reports? Is anything -- is it working or do we  
14 need to go back and re-look at it?

15 CAPTAIN DELEEUW: So yes, and you  
16 asked a question -- somebody asked me when I was  
17 on a phone call a while back, a couple months  
18 ago, about ASAP, SMS, and, you know, how do they  
19 fall exactly? I don't know which is which. So  
20 SMS is the guiding principle of safety in the  
21 airlines. That's how we manager our safety  
22 programs.

1           ASAP is a tool in this, primarily,  
2 safety assurance bucket, but clearly, it falls in  
3 different areas, but if you tell the FAA, I don't  
4 want to do ASAP, the FAA says, fine, you better  
5 have another voluntary confidential program that  
6 works as good as ASAP.

7           You can call it something else, but if  
8 you don't have one, you're not going to  
9 management system because you're not managing  
10 your safety.

11           MS. TOMAN: And when the -- prior to  
12 the final rule coming out for SMS for airlines,  
13 it was stated that every airline has to have an  
14 ASAP program. That's SMS. Well, it's not SMS.  
15 I mean, they prefer an ASAP program, because  
16 that's where you're going to get your best  
17 information, but you have to have a non-punitive  
18 safety confidential reporting program for your  
19 employees.

20           CAPTAIN DELEEUW: Yes, sir.

21           MR. MAYBERRY: I have a couple  
22 questions. On the maintenance side, do you have

1 a counterpart that promotes ASAP on the  
2 maintenance side?

3 CAPTAIN DELEEUW: Yes, so Vickie's  
4 actually the flight SMS manager. There's also  
5 what they call a tech ops, it's a new buzzword,  
6 SMS manager, and they have a tech ops ASAP  
7 manager, so everything I've talked about here,  
8 the mechanics and AMTs could give you the same  
9 brief, it would just be much more oriented  
10 towards them.

11 MR. MAYBERRY: So the lifting and  
12 briefs example you had, that came out of that  
13 program, I imagine, not the pilot program.

14 CAPTAIN DELEEUW: No, pilot program.

15 MR. MAYBERRY: And also, has it  
16 changed -- one of the questions in mind as far as  
17 your relationship with your FAA --

18 MS. TOMAN: Well, I think overall, the  
19 whole Federal Administration, if you think of the  
20 compliance philosophy, I don't know if you guys  
21 have heard that term, but that's kind of the new  
22 term within the FAA that, you know, they're

1 looking to us to manage our system, and we're  
2 reporting those hazards.

3 When I talked about the data analysis  
4 -- the safety data meetings that we have every  
5 month, we have, the FAA is there. So they're  
6 hearing everything. We're sharing everything  
7 with them, and, you know, working together with  
8 them to make sure that we are in compliance.

9 CAPTAIN DELEEUW: So the check part I  
10 get from the FAA, it's the same idea, if I do  
11 something that's dumb, different, or dangerous on  
12 the check, right, I potentially could, you know,  
13 get a bust. That is separate from ASAP. I can't  
14 file an ASAP going, I made a mistake. Woo-hoo.  
15 You still bus the ride. We don't have any guys  
16 bust anymore, quite frankly, because the  
17 training's really good, but if you can't show  
18 confidence in what you're doing, the traveling  
19 public is expecting the FAA to say, John's not  
20 going to get to fly because he hasn't proven his  
21 proficiency here.

22 But in the flying of the airplane

1       itself, are not necessarily checked right, if you  
2       make a mistake, the FAA is also expecting me to  
3       raise my hand and go, hey, I screwed this up.  
4       And to your earlier question, to be clear, if you  
5       know a little bit about this, if I'm getting a  
6       check ride in flight, so there's an FAA guy  
7       sitting in the jump seat, and I made a mistake,  
8       that guy's probably going to do, he's going to  
9       say, ah, you made a mistake. Yes, I know. He  
10      goes, are you going to file an ASAP? Yes. Thank  
11      you.

12                   He would prefer I file the ASAP versus  
13      him giving me a little ticket and saying, you're  
14      done. I mean, do you agree?

15                   MS. TOMAN: Yes.

16                   CAPTAIN DELEEUW: That's pretty much  
17      how we do it. Most of the FAA guys and gals,  
18      even if they're walking around the ramp and they  
19      see a mistake by an AMT, they're going to put  
20      their arm around and go, yes, you know you  
21      screwed that up? Yes. You're going to file an  
22      ASAP, right? Yes. File an ASAP.

1                   The FAA wants you to file the ASAP,  
2                   because if you don't tell them, there's no data  
3                   feed. And the one mistake you make might change  
4                   the entire system, so they want the data.

5                   CHAIR BURMAN: Any questions from the  
6                   audience?

7                   CAPTAIN DELEEUW: One right behind  
8                   you. Yes, ma'am.

9                   CHAIR BURMAN: She delivers our pizza.

10                  MS. PUGH: Thank you. My question, I  
11                  thought I heard you state that the short-lived  
12                  rules, we will see some of this be used by parts  
13                  of the oil, perhaps an offshore oil industry, and  
14                  perhaps you were being funny, but maybe some sort  
15                  of suggestion that some hospitals were  
16                  approaching you, could you elaborate on that and  
17                  explain, what is the relationship? Does the FAA  
18                  offer any guidance to other agencies or is this  
19                  all done through the two of you? Might you tell  
20                  us what that industry?

21                  CAPTAIN DELEEUW: So that's a great  
22                  question. So when the Gulf of Mexico folks like

1       Chevrons, Exxons, Mobil, said, hey, this thing  
2       sounds pretty cool. I wonder how we can do this,  
3       you know, because we've got a regulator called  
4       BSEE. I said, well, BSEE is about four blocks  
5       away from the FAA, tell them to go walk and ask  
6       them.

7                   The FAA can tell you everything about  
8       this program that I can. In fact, they should be  
9       the experts at it, and they are. If you talk to  
10      -- but other government agencies are slow to go  
11      call -- pick up the phone and call their friends  
12      at the FAA going, hey, what is this ASAP thing  
13      anyway?

14                   I mean, there are folks inside the DOT  
15      who don't talk to the FAA, who are looking at it.  
16      So when you look at that oil and gas industry,  
17      that's a concept, you got to bring the regulator,  
18      drag along going, hey, this is how it works. And  
19      they go, well, no, it doesn't work. You go,  
20      FAA's been doing it for 30 years. Really? They  
21      didn't even know that.

22                   So that part is different, that part's

1 a little different, but like, in the medical  
2 world, you know, they really have a OSHA, but in  
3 the medical world, they want to just fix the  
4 problem, so there's really not a regulator so  
5 much, but that's where the hospital's going to  
6 step up with the management and with the  
7 employees saying, we're going to have an ASAP-  
8 type program. Does that make sense?

9 MS. TOMAN: I think both industries  
10 have been looking at something similar to this  
11 because we've had people reach out to us so they  
12 can see what our process is and how it works. So  
13 it's just kind of, who's going to take that first  
14 step to do it.

15 CAPTAIN DELEEUW: Right. Yes, sir.

16 MR. TU: I guess this is more of a  
17 prospect question about, just for the benefit of  
18 some of the folks in the audience, this type of  
19 program does exist in the natural gas industry.  
20 If you look up corrective action programs, and  
21 they call it something different, you will see  
22 that often, so it is out there, I thought, but



1 not necessarily regulator-enforced, regulator-  
2 promoted, but it's something that's out there.

3 CAPTAIN DELEEUW: And you said this  
4 was the natural gas industry?

5 MR. TU: That's right.

6 CAPTAIN DELEEUW: Okay. And I know  
7 there's other people who do it. They don't call  
8 it ASAP. It's a similar thing. It's a beautiful  
9 thing if you can get the regulator to play with  
10 you on the game, right? Because now the  
11 regulator's involved. The regulator works well  
12 in our world because most of us are certificate  
13 employees. So they own our certificates, so we  
14 want them to play the game.

15 If you're in an industry that's not  
16 certificated, this same program could work, but  
17 you're going to not normally have the regulator.  
18 If the regulator wants to join in, man, that's  
19 powerful. The employees get it. It's a good  
20 thing to do.

21 I know I'm probably cutting into your  
22 pizza time. Well, I hope you all found this

1 interesting. We love doing this. This is, you  
2 know, we preach the gospel, because we believe  
3 this stuff, because I know it works. I live it,  
4 she lives it, we know this stuff works.

5 My recommendation, if you're  
6 interested in this, you got to be careful  
7 starting it because here's the thing we've seen,  
8 an organization hears us speak and they go, oh,  
9 yes, this is great. We're going to get started.  
10 Well, if they don't know how the mistakes were in  
11 the past, they'll start the program up, somebody  
12 didn't get the word, somebody in senior  
13 management fired an employee and filed a report,  
14 or an employee does something and he basically  
15 got fired for it, so they make a misstep.

16 And what happens now, the ASAP program  
17 that you started and thought would work well,  
18 doesn't work, it'll take you three years to  
19 recover. It takes you three or four years to get  
20 the thing working, it takes one mistake to set  
21 you back three years.

22 So I would encourage, if you think

1 something like this could work, you really have  
2 to reach out to people with expertise to say, you  
3 know, that won't work.

4 The last example I give you is, in the  
5 maintenance world, we had ASAP, it was in the  
6 hangars, so back when this started, I mean, we  
7 didn't have any laptops hanging around, there  
8 certainly wasn't an iPad, so a lot of the  
9 mechanics didn't have laptops at home, so what we  
10 did, we said, hey, well, we'll just give you a  
11 laptop at work.

12 So in the middle of the hangar, we put  
13 a laptop on the table with a big arrow that says,  
14 file your ASAP here. So everybody's working in  
15 the dock, and here comes some lowly mechanic, he  
16 gets a chair out, sits on the computer, and he  
17 hadn't even started typing, and about 30 of his  
18 buddies come up and going, dude, why are you  
19 doing this? What mistake did you make?

20 So if you don't have a private thing,  
21 now, we've changed that because everybody's got  
22 iPads, so we fixed that piece, but those are the

1 lessons learned because, we couldn't figure out  
2 why we weren't getting ASAPs in the maintenance  
3 world.

4 You know, we just couldn't figure it  
5 out. It never dawned on us. It was like, well,  
6 it's not very confidential if you're the guy in  
7 the middle of the hangar, because they all know,  
8 you're the man that just turned everybody in for  
9 a mistake, right?

10 So my advice is, make sure if you do  
11 it, this program will work in almost every  
12 industry, it's just a culture of change, it  
13 requires buy-in from the leadership, and buy-in  
14 from the employees to say, yes, we want your  
15 reports, and you're going to trust us not to fire  
16 us if we give it to you.

17 MS. THEBERT: Which group are the most  
18 reports? Like, pilots, or mechanics?

19 MS. TOMAN: I would say, probably  
20 pilots. That was actually the first ASAP program  
21 we started, was for the pilots, and then we  
22 started -- the other operational groups started

1 adding on programs for them. And then, you know,  
2 we have an agreement on each one of those with,  
3 you know, their labor person, as well as with the  
4 FAA, and the company. There's an MOU, what I  
5 called earlier, agreement that's signed, and  
6 that's a separate agreement for the flight, a  
7 separate one for cabin, et cetera.

8 CAPTAIN DELEEUW: Yes, sir.

9 MR. ROBERTI: I may have missed this,  
10 because I late two minutes when the presentation  
11 started, but what is the end stage for the  
12 request?

13 CAPTAIN DELEEUW: Well, the FAA's  
14 aware of all -- I think Vickie mentioned it  
15 earlier, the FAA, they go to all our data  
16 analysis meetings once a month, so they have  
17 complete -- we don't give it out to the public.

18 MS. TOMAN: Are you talking about  
19 enforcement to the employee?

20 MR. ROBERTI: Enforcement to the  
21 company.

22 MS. TOMAN: To the company. I mean,

1 the company still has to follow the rules. We  
2 have a voluntary self-disclosure program where if  
3 we see something that we have to disclose to the  
4 FAA, but -- and then the company's responsible if  
5 something's reported and is that part of that  
6 safety policy, that our senior leadership, if  
7 someone reports a hazard to you, it's your  
8 responsibility that you have to fix it, or reach  
9 out to somebody.

10 CAPTAIN DELEEUW: So there is, kind  
11 of, a mechanism, so that's kind of what Vickie's  
12 role is now. If the company knows a systemic  
13 mistake that's been going on, the company can do  
14 a VSD. And that's like an ASAP report. It's not  
15 the same, but it's the same and if the VSD is --  
16 the FAA goes, yes, we get it, you guys didn't  
17 intentionally do it, fix it in two weeks. Let us  
18 know you guys fixed the problem.

19 Now, if you don't fix it, then you're  
20 looking at civil penalties, but that's the out  
21 from the corporation. They have a mechanism, and  
22 I don't know if you want to say any more about

1 it, but that's, really, essentially it, right?

2 MS. TOMAN: Yes.

3 CAPTAIN DELEEUW: Okay. It's just,  
4 they don't call it ASAP, but it's a voluntary --

5 MS. TOMAN: The company, I mean, you  
6 can't ASAP it, so we still have a responsibility,  
7 even though an employee may be involved, and they  
8 have these -- the company, they haven't changed a  
9 lot.

10 CAPTAIN DELEEUW: It's all part of the  
11 DOT. I think you all know who they are.

12 CHAIR BURMAN: Well, thank you very,  
13 very much. This was --

14 CAPTAIN DELEEUW: Thank you.

15 CHAIR BURMAN: Next, we're going to  
16 have Agenda Item 3, which is the Inline  
17 Inspection System, but I do just want to  
18 recognize that Paul Roberti is in the house, so  
19 very nice to see you. Thank you very much for  
20 being here. For those of you who don't know,  
21 he's General Counsel now at PHMSA, but he was a  
22 former state regulator and we're lucky to have

1 him, so thank you.

2 (Whereupon, the above-entitled matter  
3 went off the record at 2:44 p.m. and resumed at  
4 2:50 p.m.)

5 CHAIR BURMAN: All right. We're ready  
6 to get started. We're going to try to make up  
7 some time also. And I do want to say we are  
8 almost out of pizza. So if you're looking for  
9 your third slice, now is the time to get it.

10 MR. HEVLE: Well, thank you so much  
11 for opportunity to talk to the work group again.  
12 I want to, first of all, assure everybody that  
13 I'm just as excited about my material as John and  
14 Vickie were about theirs. I think you can tell  
15 from my expression.

16 I'm a Corrosion Engineer and this  
17 really is exciting, but it is a little dry. But  
18 the reason why I'm going to talk about API-1163  
19 today is that there are a lot of components of  
20 API-63 that apply directly to the type of things  
21 that we're talking about.

22 We're talking about information.



1 We're talking about self-audits. We're talking  
2 about things like that. And there's components  
3 already being applied within the ILI process as  
4 part of 1163.

5 And so, that's why Mark had asked me  
6 to make a presentation to the Process Sharing  
7 Group. And we did that over the phone. And they  
8 felt like there was enough information here to  
9 talk about to the big group. What I did was, for  
10 this presentation, I pulled out every kind of  
11 mention of information sharing in the standard.

12 I'm not going to dive deep into the  
13 details of this. There are examples that would  
14 apply to, I think, almost every sub-committee and  
15 almost every topic within this. So I'm going to  
16 skip over some stuff.

17 But my main purpose is to show you  
18 there's a wealth of data sharing already going  
19 on. Although it's not as comprehensive as the  
20 scope that we're talking about for this  
21 committee, there's a lot of data sharing that's  
22 already going on.

1           So API-1163, already has a lot of  
2 process requiring data sharing. Most of these  
3 data sharing processes relate to data shared  
4 between the customer, or the potential customer,  
5 and the vendor in developing the performance  
6 specification.

7           The performance specification is like  
8 the master contract between the customer, the  
9 pipeline operator, and the vendor, the ILI  
10 service provider, in how the whole thing is going  
11 to work, both from providing information about  
12 your system, providing information about the tool  
13 and the accuracies, establishing common goals,  
14 you know, what are you trying to find.

15           Different tools have different  
16 capabilities. Accuracy evaluating the quality of  
17 the results, and all of that, are part of the  
18 performance spec. The data is shared in both  
19 directions. The vendor provides data to the  
20 customer. The customer provides data to the  
21 vendor.

22           API-1163 also incorporates a number of

1 other standards, including ASNT, ILI-PQ, which is  
2 qualifications, and NASAS PO 102, inline  
3 inspection by reference. These sub-standards  
4 also have some data sharing components.

5 So there's a wealth of data sharing  
6 that's already going on. Here's just kind of a  
7 visual of data sharing, this data sharing  
8 process, as it relates to Kinder Morgan's natural  
9 gas pipeline procedures.

10 I work -- I'm Drew Hevle. Sorry --  
11 Drew Hevle. I work for Kinder Morgan. I'm  
12 Manager of Corrosion Control in our natural gas  
13 pipeline system. So this is the scope of API-  
14 1163 which is called inline inspection systems  
15 qualification.

16 We had an API representative here  
17 earlier. And when I gave this presentation on  
18 the phone, he gave us a little update about the  
19 status of this standard. It's presently being  
20 updated. There's a committee actively working on  
21 it. So there may be changes.

22 There likely will be some changes. I

1 don't know how significant. I don't know the  
2 time-line because these things are -- as you  
3 know, committee work products take time and  
4 aren't always amenable to going to a particular  
5 schedule.

6 So the emphasis here is mine. I  
7 identified some key points -- close cooperating  
8 and interaction between the service provider and  
9 the customer or pipeline operator.

10 The standard provides requirements  
11 that will enable service providers and operators  
12 to clearly define the areas of cooperation  
13 required and ensure the satisfactory outcome of  
14 the inspection process. And that's --  
15 ultimately, our goal here is to increase  
16 cooperation to provide a more satisfactory  
17 outcome, which is safety.

18 The scope of this document is  
19 amendable to the scope of what we've been talking  
20 about with relation to ILI. It includes feather  
21 tools, self-propelled tools, or free-flowing  
22 systems, over a wide variety of different threats

1 and can be applied to both existing and  
2 developing technology.

3 So if you have a new technology, that  
4 doesn't immediately make 1163 out of date. The  
5 standard's an umbrella document that provides  
6 performance-based requirements.

7 It includes procedures, personnel,  
8 equipment, associated software. The standard  
9 also includes MACE SP-0102 inline inspection of  
10 pipelines and ASNT ILI-PQ, which relates to  
11 inline inspection personnel qualification and  
12 certification.

13 All of it developed enabling service  
14 providers and operators to provide rigorous  
15 processes that consistently qualify the  
16 equipment, et cetera. In the inline inspection  
17 industry, that's a little redundant. So it's not  
18 technology-specific. It's performance-based and  
19 provides requirements for qualification  
20 processes. One objective is to foster continual  
21 improvement.

22 And that's a goal of integrity

1 management systems. That's a goal of safety  
2 management systems. And continuous improvement  
3 is a key driver to continue to reach the goal,  
4 which is a little asymptotal. Is that the right  
5 word?

6 But, ultimately, trying to reach that  
7 goal of -- in our department, we call it zero  
8 failure/full compliance, trying to get to that  
9 perfect result. I mentioned ILI-PQ here,  
10 incorporated by reference and the MACE SP-0102.

11 This was mentioned, this data was  
12 mentioned in another presentation as well. Here  
13 is the scope of ILI-PQ. Really, minimum  
14 requirements for qualification and certification  
15 of inline inspection personnel. And it includes  
16 three different levels of qualifications.

17 Here is, essentially, the scope. It's  
18 really the outline of SP-0102. It includes  
19 sections on tool selection, compatibility,  
20 logistical guidelines, scheduling, planning, data  
21 analysis, data management. And then, it also  
22 includes a sample Pipeline Inspection

1 Questionnaire, which is, by definition, a  
2 mechanism for information sharing between the  
3 customer and the vendor.

4 So when you're trying to select an ILI  
5 tool, it's important that both the capabilities  
6 of the ILI tool and the characteristics of the  
7 pipeline are considered, in addition to the goals  
8 and objectives of that ILI.

9 If you have a tool that is capable of  
10 detecting small cracks, but the goal of your  
11 assessment is to detect metal loss of corrosion,  
12 those two may not be compatible and vice versa.

13 If you're trying to detect cracks and  
14 you have a tool that's designed to detect general  
15 metal loss, it's not going to be as accurate or  
16 may not meet the goals that you're trying to  
17 accomplish at all.

18 So this information is shared through  
19 a pipeline questionnaire. This is some -- this  
20 is an example of data versus information. So  
21 this would be data related to the characteristics  
22 of the pipeline that a pipeline operator would

1 share with the vendor. Hey, we're operating at  
2 this temperature and this pressure. That would  
3 go to, you know, is the tool compatible with  
4 that?

5 Can it run reliably in those  
6 conditions? How clean is the pipeline? Are  
7 there characteristics of the product? What's  
8 inside the pipeline that would limit a successful  
9 inspection?

10 And I'm not going to go through all of  
11 these details. But, they talk about things. Is  
12 the tool capable of being reliably -- passing  
13 through with bend radius and flow velocities?

14 Are there things that are going to  
15 cause a tool to get stuck? Are there things that  
16 are going to prevent the tool from measuring  
17 accurately what it's intending to measure?

18 And so, the selection of the ILI  
19 system is based on the goals and objectives with  
20 a number of considerations here. And all of  
21 these considerations would involve a discussion  
22 between the ILI tool provider and the operator.



1           And then, the operator selects the one  
2           or more appropriate ILI systems that meet the  
3           goals and objectives established. And  
4           oftentimes, an ILI assessment involves running a  
5           number of tools. It involves -- it might involve  
6           running a tool to assess whether the instrumented  
7           pig can pass safely through.

8           It involves a gauge tool to measure  
9           for dents. And then, it might involve running an  
10          instrumented tool or multiple tools in a chain of  
11          tools, that would provide location information as  
12          well as measure wall thickness and look for other  
13          types of defects.

14          So the performance spec, as I  
15          mentioned, is the contract, the bible, the  
16          agreement, between the operator and the vendor,  
17          as to whether the tool can meet the requirements  
18          of the performance specification.

19          We are looking for this type of  
20          thread. We want this type of accuracy. Here are  
21          the operating conditions. And if -- both parties  
22          have to agree, that those things will be met.

1           And then, you establish things about  
2 what type of data are you going to report. What  
3 type of thresholds, lower limit thresholds, are  
4 you going to report? You have a know a little  
5 bit about what you expect to find in order to  
6 make those kind of decisions.

7           Is this an older pipeline which has a  
8 marginal maintenance history or is this a brand  
9 new line where you would want to see every little  
10 thing?

11           And so, there's a requirement for  
12 performance specs to define through statistically  
13 valid methods, the ability of the ILI system to  
14 run in a specific pipeline to detect, locate,  
15 identify in size, pipeline anomalies, components,  
16 and features.

17           So not only do you have to, in the  
18 performance spec, assert that you're going to  
19 meet these requirements, you have to say, within  
20 a statistical range, how you're going to meet  
21 those.

22           And then, the performance of that tool

1 can be evaluated after the fact to determine, did  
2 you meet this statistical approach.

3 And, because an ILI tool may be  
4 designed to assess more than one type of anomaly,  
5 you may need to have a number of different types  
6 of anomalies or characteristics spelled out as  
7 far as accuracy. So, if a tool measures both  
8 internal, external, and crack-like indications,  
9 then you would have separate specs for those  
10 assessments.

11 So this is defining the difference  
12 between detection, sizing, identifying, and  
13 characterizing anomalies. And some more detail  
14 about some information in the performance spec.  
15 You know, how you're going to measure distance.

16 Are you going to use the footage from  
17 the initial assessment or maybe they'll use a  
18 different unit. Maybe they use meters. Or are  
19 you going to use GPS coordinates or you're going  
20 to use company stationing or some other method.

21 Because this is important when the  
22 company has to go back out and relocate areas to

1 excavate and assess or assess and repair. So,  
2 more information about all of the types of things  
3 that you would include in the performance spec.

4 Here's some examples of why what is  
5 reported from an ILI tool might differ from what  
6 you see when you excavate it. There are  
7 limitations to the physics of the tool and  
8 therefore, you're going to see differences  
9 between what the tool reports and what you would  
10 see when you excavate the pipeline.

11 And there are things that would either  
12 increase or decrease that accuracy of detection.  
13 For example, as the wall or the pipeline gets  
14 thicker, it becomes more difficult to assess  
15 accurately with the same magnetic field.

16 And if you have speed outside of the  
17 range, if the tool is going too fast, you have a  
18 reduction in accuracy. All of these things are  
19 defined within the performance spec, based on the  
20 conditions of the particular pipeline.

21 And they would all affect the  
22 probability of detection and the accuracy of the

1 tool. And where consequences justify the effort,  
2 an operator may consider a review of the service  
3 provider's quality management procedures  
4 regarding tool assembly, component sourcing, and  
5 traceability, in considerations of unusual  
6 loading regimes.

7 So we do reviews of our service  
8 providers' quality management systems. We do  
9 that on an annual basis. We go out and visit  
10 each one of the major ILI service providers that  
11 we work with. And we interact on their  
12 processes.

13 This goes both to reliability of a run  
14 -- if you put a tool in a pipeline and you spend  
15 all of the effort to run it and you don't get  
16 back accurate data, you've spent quite a bit of  
17 money really, for not getting the value that you  
18 want.

19 So you want to have an accurate run  
20 each time. Even if the vendor doesn't charge you  
21 a nickel, you still have downtime and you still  
22 have operational costs associated to that. So

1 execution, quality of execution, is important.

2 But it also goes to the accuracy. If  
3 you lose a sensor off of a tool, that is a  
4 reduced level of accuracy than what you could  
5 have accomplished. And so, the quality of the  
6 building and the maintaining of the tool is  
7 important as well.

8 So the performance spec has to be  
9 qualified by the service provider using some kind  
10 of methodology defined by the service provider.  
11 And the methodology and data used to qualify that  
12 performance spec has to be fully documented and  
13 available for review.

14 And so, this is an example of a big  
15 data share between a vendor and a customer or a  
16 potential customer where they say, we've run this  
17 tool in these conditions this many times.

18 And the results that we have, based on  
19 operator's feedback of excavations and  
20 measurements is this probability of detection,  
21 this probability -- this level of accuracy.

22 And the qualification methodology is

1 reviewed on annual basis to ensure that it's  
2 still valid. And significant errors in  
3 detection, identification, and sizing have to be  
4 investigated, including -- we require root cause  
5 analysis.

6 And they define significant errors as  
7 those being outside of the performance  
8 specification, root cause. Exciting material,  
9 for a corrosion engineer. I just want to second  
10 your comments about the dynamic presentation of  
11 Vickie and John.

12 That was really an interesting one  
13 with the back and forth. I don't have anybody to  
14 throw to.

15 MR. STODY: You were great.

16 MR. HEVLE: Thanks. Thanks. I  
17 appreciate that. Anyway, pre-inspection, this is  
18 my wheelhouse, so I'm enjoying this, as I  
19 mentioned. I assure you, I have as much  
20 excitement as they do, inside.

21 MR. STODY: All right. Drew, back to  
22 you.

1           MR. HEVLE: So, pre-inspection, they  
2 talk about, here are the things that you need to  
3 do as part of a pre-inspection -- inline  
4 inspection, before you run the tool.

5           And most of this does involve data  
6 sharing back and forth, between the operator and  
7 the vendor. There are some other things,  
8 testing, mechanical checks, laying out above-  
9 ground markers.

10           The inspection itself, you load the  
11 tool in a launcher, you launch it. You monitor  
12 the progress of the tool and make sure it's not  
13 going too fast. You adjust the flow of the  
14 product in the pipeline to ensure that the tool  
15 runs within its speed.

16           And then, you have markers that are  
17 indicated as the tool runs by. So you put a  
18 magnet on the ground and the tool will detect  
19 that magnet so you can tie above-ground location  
20 to a feature on the pipeline.

21           That's becoming less and less  
22 important with really our very accurate GPS



1 systems and geometric tool capabilities to  
2 measure very precisely, direction and distance.  
3 Back in the day, it was just a, and still is, a  
4 wheel turning.

5 And they measured how many times the  
6 wheel -- you know, how big around the wheel is.  
7 And so, that measures the distance. But there  
8 are other methods to determine where you are in  
9 time and space.

10 And then, finally, receiving the tool,  
11 getting the tool out, making sure that it doesn't  
12 get stuck, and it comes out and it comes out in  
13 one piece. That's always a good sign.

14 And then, finally, post-inspection,  
15 you do some functional tests as soon as you get  
16 the tool out, just to make sure everything is  
17 working. You want to know right away. Then you  
18 do some initial checks on the data.

19 You do some direct measurement to  
20 evaluate, hey, what did the tool record as tool  
21 speed throughout the run, you know, temperatures,  
22 et cetera? Did we get a good run? Look for data

1 completeness. Back in the day, tools recorded on  
2 magnetic tape.

3 And you could break the tape and the  
4 tool ran the whole distance without recording  
5 anything and you had to do it again. Nowadays,  
6 it's all on solid state discs. And finally,  
7 you'd look at data quality.

8 So here's kind of a flow chart of the  
9 verification process. There are a number of  
10 different -- there are three levels defined  
11 within 1163 for how you validate the data.

12 And Level 1 is the lowest, the least  
13 rigorous application of the verification, where  
14 you can use historical data. For example, I ran  
15 this tool in the same line just upstream and  
16 downstream the prior year, and we got good  
17 results and we validated those.

18 And therefore, I don't necessarily  
19 need to do a rigorous evaluation with field  
20 measurements. And I'm going to accept the  
21 performance based on the checks that we did at  
22 the end of the run.

1                   Or, a Level 2, where you use some  
2 field measurements to check your performance  
3 against the stated tool specs. So you'll do some  
4 prove-up digs and compare the results of what you  
5 get in the ditch versus what the tool said.

6                   And if those meet the spec, you can  
7 say, well, I'm validating the data. Or if that  
8 doesn't work out, then you can go to a Level 3  
9 where you have to have a statistically  
10 significant number of data points in order to  
11 validate that.

12                   And that would be, probably, only used  
13 for a brand-new technology, for example, or a  
14 really unusual application of an existing  
15 technology where there's not a good history of  
16 application for that.

17                   So it's not very common to require the  
18 Level 3 validation in order to have a confidence  
19 in your data set. So there's a number of  
20 characteristics to the evaluation of the results,  
21 the process of verification or quality control,  
22 comparison with historical discrepancy analysis

1 of pipeline components records.

2 So if you run the tool and it says,  
3 hey, you've got a T here, a T here, a T here and  
4 then you look at your drawings and you don't have  
5 any of those, you're like, well, what's going on  
6 here? Are my drawings wrong or is the tool  
7 wrong?

8 Enhanced data integration --  
9 oftentimes, nowadays especially, we'll take data  
10 and combine it in order to do effective analysis.  
11 We'll overlay the ILI data with pipe information,  
12 with geographical information, with data like  
13 cathodic protection data, close level survey  
14 data.

15 And that will tell you a lot about the  
16 information that you're seeing and will allow you  
17 to do some kind of initial root cause analysis to  
18 identify, oh, we've got lower levels of cathodic  
19 protection here.

20 And we have higher levels of external  
21 corrosion metal loss. They may be correlated.  
22 Using validation measurements, inclusions on

1 using validation measurements' assessment of  
2 inline spectral performance.

3 Oh, insufficient data for an image.  
4 I've never seen that one before. That was not  
5 intended. I'm trying to remember what the image  
6 was.

7 MR. HERETH: Maybe it was sense  
8 contact?

9 MR. HEVLE: Yes. Can you open the --  
10 no. We're okay without it. I think it was just  
11 a big -- a flow diagram of the process. And  
12 then, reporting is important.

13 I mean, you're running this tool and  
14 the results of the tool, the deliverable, is the  
15 report. And so, it really is important to be on  
16 the same page with the vendor on what and how  
17 you're going to report these data.

18 Because that is the ultimate data  
19 sharing. That's the fundamental data sharing  
20 that happens with inline inspection, is the  
21 vendor shares the data with you. And then you  
22 evaluate it and take action on it.

1           So, as part of the report, the  
2 performance spec is always included as part of  
3 the report so that you know the basis for all of  
4 this data. Where did this data come from? What  
5 were the goals and objectives?

6           What were the conditions?  
7 Qualification method, Level 1, Level 2, Level 3,  
8 and then all of the data associated with that.  
9 Equipment specs, these tools evolve and their  
10 capabilities evolve. And even if you run the  
11 same tool from the same vendor, our ILI cycle for  
12 high-consequence areas under IMP is seven years.  
13 Seven years later, imagine how much a computer  
14 changes in seven years.

15           Does anybody else have a seven-year-  
16 old laptop? I do. Our replacement cycle is  
17 seven years on our laptops. I assure you, my  
18 laptop is not the same as the new laptops.

19           So there's quite a -- for the same  
20 tool, the same vendor, there's quite a different  
21 in capabilities between assessment cycles. And  
22 so, it's important to capture that because you're

1 looking at these results historically.

2 We're wrapping up the second cycle of  
3 assessment in the gas industry. On hazard/slick,  
4 we're in the third cycle, I think, or maybe a  
5 little beyond the third cycle? I'm a gas guy.  
6 So, sorry.

7 MR. HERETH: '04 and '08 were  
8 baselines. Yes.

9 MR. HEVLE: Yes. So first baseline  
10 assessment is what do I got out there? The  
11 second assessment is oh, why did it change? Did  
12 it change? Why did it change? And so, we're  
13 going to rely more on comparing data today from  
14 data from seven years ago and 14 years ago as  
15 part of this.

16 And you need to capture all of the  
17 conditions and assumptions that were built into  
18 those assessments in order to give them a proper  
19 evaluation.

20 Report contents -- generally you want  
21 some kind of summary. You want your spectral  
22 results. You want reporting formats for

1 particular processes within your company.

2           And one of the things that this  
3 committee, I think, needs to consider is  
4 developing a data format for ILI data that  
5 vendors or that operators could include in their  
6 basic spec as a separate line-item to say, give  
7 us the data in this format for information  
8 sharing.

9           And that would prevent you from having  
10 to reinvent the wheel every time you need to  
11 import data from this vendor or that vendor. We,  
12 at Kinder Morgan, establish a consistent  
13 reporting format across all of the vendors.

14           So we get the same format of data and  
15 same format of report, regardless of who's doing  
16 the assessment. Because we do between 120 and  
17 150 segments a year, we have to automate some of  
18 those processes.

19           We have to get everything in a  
20 consistent format and I think there's some  
21 opportunity here to define a format for  
22 information sharing and automate this process.



1                   And finally, quality management system  
2 is required as part of 1163. And there's a lot  
3 of details here about procedures and work  
4 instructions. That goes to the comment that John  
5 had made about aging out of people in the  
6 industry and capturing that knowledge.

7                   If you have detailed work  
8 instructions, well, I don't need work  
9 instructions. But the guy who comes in behind me  
10 would really find those work instructions to be  
11 beneficial, at least initially, for sure.

12                   Good record-keeping, document revision  
13 control. Again, this stuff is important when  
14 you're looking at something in a historical  
15 context.

16                   Design change control, qualifications  
17 of personnel, calibrations and standardization of  
18 the equipment, traceability of the materials, and  
19 then, continuous improvement.

20                   And this is the last slide. API-1153  
21 includes most of the components of a safety  
22 management system. And so, I captured, from an

1 SMS standard, the general topics that were  
2 included in that, that are also included in API-  
3 1163.

4 There's a huge overlap. API-1163 is  
5 not sufficient for a safety management system and  
6 not sufficient for an information sharing for  
7 what this group is trying to accomplish.

8 But a lot of it is still there and in  
9 place. API-1163 is incorporated by reference  
10 into the Hazardous Liquids -- you can tell I'm a  
11 gas guy -- Hazardous Liquids Pipeline 195  
12 requirements.

13 And it's proposed to be included in  
14 the Natural Gas Pipeline Safety Standards as part  
15 of the Notice of Proposed Rule-making. And so,  
16 this is being done out there. And it's being  
17 done by a lot of operators.

18 It's required to be done on the  
19 hazardous liquids side. It's going to be done  
20 and is already being done by a lot of operators  
21 on the gas side.

22 So I think there's opportunities to

1 mine these processes for data sharing and things  
2 that are already going on and use this as a  
3 baseline for what is already happening.

4 Maybe we need to expand that into  
5 other areas to make it comprehensive. But as far  
6 as ILI data, there's a lot of sharing going on  
7 right now. Thus concludes my presentation.

8 CHAIR BURMAN: That was riveting.

9 MR. HEVLE: Thank you. Do we have  
10 time for --

11 MR. WARNER: Drew, I wanted to see if  
12 I understood correctly. You mentioned a  
13 standardized reporting format as maybe a  
14 solution.

15 Were you recommending that this group  
16 include that in whatever our final  
17 recommendations are?

18 MR. HEVLE: If you want to get raw ILI  
19 data as part of this for -- and I don't know that  
20 that is within the scope of what you're talking  
21 about.

22 But if you do, creating a format for

1 that and then asking operators who are  
2 participating to include that in their  
3 performance spec as a recording option -- say,  
4 hey, also give us the data in this format, would  
5 allow you to automate that process. Make it  
6 super easy to just say, hey, send this.

7 And the way it works in our company,  
8 send this report to this guy, and then, send this  
9 data in this format to this email address or  
10 through this share point or some delivery  
11 mechanism.

12 And then, the RGIS people, for  
13 example, take that ILI and import it and then  
14 it's available for analysis by not just the ILI  
15 analysis guys at our company, but everybody in  
16 the company can access that GIS system and look  
17 at the data on the GIS system. Yes?

18 MR. JONES: You said this is widely  
19 used. I want to understand that a little better.  
20 So when you said sharing, are you saying sharing  
21 between vendor and customer or are you saying  
22 between competitors or between the regulators?

1 Like, when you say it's widely done?

2 MR. HEVLE: Yes.

3 MR. JONES: That's a big statement.

4 MR. HEVLE: Right.

5 MR. JONES: But it's not clear to me,  
6 based on two-and-a-half years of --

7 MR. HEVLE: Okay. Applying 1163 is  
8 mostly between vendor and a pipeline operator.  
9 Most of the data sharing is there. That could be  
10 --

11 MR. JONES: So vendor and customer?

12 MR. HEVLE: Yes. Exactly right.

13 MR. JONES: Okay.

14 MR. HEVLE: There are some components  
15 where, for validation, for the vendor qualifying  
16 in their tool, they use data from other  
17 operators. But they scrub it.

18 And they'll say, okay, this tool has  
19 run 10,000 miles in 24-H pipeline, natural gas  
20 pipelines. And here's the statistical results  
21 that we got from the digs that we've done on  
22 those pipelines.

1 MR. JONES: But, for the most part,  
2 when you say vendor sharing, you're just saying  
3 between customer and --

4 MR. HEVLE: Yes. Correct.

5 MR. JONES: All right.

6 MR. HEVLE: But, because it's already  
7 happening, that's an opportunity to use for -- to  
8 make it broader by this committee.

9 MR. JONES: Yes. I agree.

10 MR. HEVLE: But these processes -- I  
11 mean, it's easy to take a process that's in place  
12 and say, oh well, let's expand that to do other  
13 things with that, than it is to create a new  
14 process and say, hey, everybody do this new  
15 thing.

16 MR. JONES: Agreed.

17 DR. DENG: I have a full-out comment  
18 on this format. I think that's a great thing to  
19 do. But I think that's probably only going to  
20 apply to limited data and ILI data, definitely we  
21 should do that.

22 But if you look at the complexity of

1 the data, including like, historic data, expert's  
2 opinions, model, face data, official data, it's  
3 really challenging to do this kind of --  
4 something about data normalization.

5 MR. HEVLE: Yes.

6 DR. DENG: For that -- right? So --

7 MR. HEVLE: Yes. That's going to be  
8 the huge challenge of this committee is how do  
9 you -- the data that we get is pretty specific to  
10 both pipeline conditions and to the tool which  
11 would include who the vendor is.

12 DR. DENG: Right.

13 MR. HEVLE: Sometimes, the assessment  
14 technologies re completely different and  
15 identifiable by very basic things.

16 DR. DENG: Yes. So that's where  
17 datamatics is very important because maybe all  
18 this kind of normalization or fusion should be  
19 done at an informational level instead of a data  
20 level.

21 So maybe like a future level, fusion  
22 of information, that's something we should do,

1 not just on a data level. That's very difficult  
2 to normalize.

3 MR. HEVLE: Yes. I agree one hundred  
4 percent. I mean, that was, I think, pretty clear  
5 at the beginning of this. It's not the same kind  
6 of data that we're dealing with, as in the  
7 airline industry.

8 It's not the same kind of data that  
9 we're dealing with as in some other fields which  
10 may be easier to make a generic and applicable  
11 across other systems and conditions.

12 CHAIR BURMAN: Any other questions or  
13 comments at the table.

14 MR. BELLAMY: Yes. Michael Bellamy.  
15 So, Drew, we know that Kinder Morgan has  
16 definitely taken API-1163 very seriously,  
17 implemented some very robust programs around  
18 that.

19 Can you talk to the notion of the  
20 unity plot? Because the real gold dust from a  
21 technology improvement point of view is -- at  
22 least ILI -- is that comparison between what was



1 culled in the report and what you found in the  
2 ditch.

3 MR. HEVLE: Yes. So that may be, in  
4 the kind of narrowest view of the scope of this  
5 committee, that may be the -- one of the  
6 opportunities is to look at the accuracy of the  
7 results.

8 And by accuracy, I'm saying comparing  
9 what the tool called versus what you actually  
10 measure in the ditch. And, in a perfect world,  
11 those would be one-to-one. With a perfectly  
12 accurate tool, you would have the same call.

13 It would say, this is a 100 mill depth  
14 defect that's one-inch long and one-inch wide.  
15 And then you go out and measure it and it's  
16 exactly that.

17 And so, if you plot depth of what the  
18 tool calls on one axis versus what you measure in  
19 the ditch versus what the tool called, you should  
20 have a straight line.

21 And anything that you deviate from  
22 that line is a level of inaccuracy. And you can

1 -- that's called a unity plot.

2           And that's usually -- one of the  
3 almost always included methods of evaluating the  
4 accuracy of the tool is you plot this out. And  
5 very quickly you can see what are the trends.

6           Do I see a skewed in deeper defects to  
7 either under-call or over-call and smaller  
8 defects, either under-call or over-call.

9           And so, by the shotgun scatter that  
10 you see at these points around the line, you can  
11 glean some information about how accurate this  
12 tool is.

13           One of the opportunities might be to  
14 identify how to improve that accuracy or to get a  
15 better understanding of that accuracy across all  
16 tools by this committee.

17           That would improve safety. But the  
18 results are dependent on, well, how accurate was  
19 your measurement in the ditch? Typically or  
20 often, it's not a high-tech thing.

21           You have a guy with a pit gauge that  
22 has a little poker. And it measures down to the

1 bottom and you measure on a ruler. That's old-  
2 school technology.

3 But you -- because this is a  
4 measurement by a person, a human being, there are  
5 opportunities for making mistakes.

6 And certainly, that gauge measurement  
7 example that they used was striking, about how  
8 human error is part of this. So I don't know if  
9 that's what you were looking for when you asked  
10 the question.

11 DR. DENG: Yes. Exactly. And, if I  
12 might also follow on?

13 MR. HEVLE: Yes.

14 DR. DENG: We can do a double act  
15 here, if you like?

16 MR. HEVLE: All right.

17 DR. DENG: So you don't feel  
18 completely alone. There is also that notion that  
19 when you see an outlier, then it becomes worthy  
20 of investigation.

21 If something is close, is within the  
22 performance specification, close to that unity

1 line, within the margin of error, you can feel  
2 fairly comfortable.

3 MR. HEVLE: Yes.

4 DR. DENG: Those outliers are the ones  
5 that -- and should attract our attention --  
6 provide the opportunities for improvement.

7 MR. HEVLE: Yes. I should've  
8 mentioned, as part of the performance spec, you  
9 identify statistically a plus or minus. And then  
10 you typically draw those plus or minus lines  
11 along with the unity line.

12 And you expect that a certain  
13 percentage, statistically, of those points, will  
14 fall within those acceptable ranges. And that's  
15 a visual way of calculating the statistical  
16 effectiveness.

17 Are you meeting that spec? You can  
18 look at the docs and count the ones that fall  
19 outside and calculate that percentage. And it's  
20 a very easy way of doing that. Yes.

21 DR. DENG: So I know you've also --  
22 just as you've been very rigorous with inline

1 inspection vendors in your qualification process,  
2 using API-1163, I know you've also been -- Kinder  
3 Morgan has been very rigorous in your  
4 qualification program for the in-ditch  
5 technologies and providers. So you've got both.

6 MR. HEVLE: Well, that's just as  
7 important. That's just as important as the  
8 accuracy of the tool.

9 If you're not properly evaluating what  
10 you see in the ditch, then you're not properly  
11 evaluating the quality of the data of the ILI.  
12 And you're not properly evaluating the fitness  
13 for service of the pipeline. That's number one.

14 Number two, we do a full root cause  
15 analysis of every excavation. And because of  
16 that, we need a broader data set. We measure AC  
17 potential, VC fire protection levels.

18 We measure soil resistivity so we can  
19 calculate AC density so we can determine, was  
20 this potentially AC corrosion versus corrosion  
21 because we didn't have adequate levels of CP.

22 We do a wide variety of things in the

1 ditch. And so we need our NDE guys who are doing  
2 those inspections to be consistent in how they do  
3 that, to be qualified in how they do that.

4 And we hand-pick the people who does  
5 this for us. And it's a pretty big scope. So we  
6 have a school once a year and train these guys in  
7 how we want our data obtained.

8 DR. DENG: Thanks. I have one more.  
9 Just this -- so now I've lost it. Sherry, you  
10 take it now.

11 DR. BORENER: This is Sherry Borener.  
12 I actually thank you again. I've done it twice.  
13 I've heard your presentation twice. So one  
14 question I have now, and it has to do with  
15 outcomes.

16 So you seem to have collected a set of  
17 data which is the outcome of the inline  
18 inspection through the outcome of the in-ditch  
19 inspection?

20 MR. HEVLE: Yes.

21 DR. BORENER: Do you have a database,  
22 then, of what you call an event which would be a

1 corrosion event or something like that that says,  
2 I've got this place on this -- you know, this is  
3 the thing I've found.

4 And here are all the data observations  
5 I had up until the moment that I heard that that  
6 is a --

7 MR. HEVLE: We don't have a  
8 comprehensive database yet. That's one thing  
9 that we're working on, is to have all of our  
10 anomaly information in one data set, so that we  
11 can do broad analysis and querying.

12 And right now, it's a data set for a  
13 tool run and it lives by itself.

14 DR. BORENER: But, at some point, you  
15 would be able to register this all to a single  
16 lat-long? Is that possible? I mean, to a  
17 particular --

18 MR. HEVLE: Oh, absolutely. And our  
19 GIS system is going to be the hub for that. So  
20 all of this information is going to load into an  
21 anomaly database.

22 That anomaly database is linked to our

1 GIS as a layer. You can just click a button and  
2 you look at this pipeline and you can see every  
3 excavation, every anomaly, everything you wanted  
4 to know.

5 DR. BORENER: So would that also then  
6 -- could you relate that, in the end, to  
7 incidents and accidents? So, in my mind, you  
8 want to be able to say, this is actionable  
9 because 80 percent of the time, that thing,  
10 within the next year, turns into something that  
11 requires remediation.

12 So, you know what I mean? You're  
13 trying to create a database of likelihoods and  
14 outcomes and an association with a bunch of data  
15 that you've collected since you started.

16 MR. HEVLE: We have the piece. Right  
17 now, many of our assessments, we're able to  
18 compare to the prior assessment and calculate a  
19 growth rate and project that out to insure that,  
20 not only do we fix the things that we need to fix  
21 today, but we fix everything that needs to be  
22 fixed before we run the tool again. So we --



1 DR. BORENER: So that's kind of your  
2 expected goal?

3 MR. HEVLE: Yes.

4 DR. BORENER: Okay.

5 MR. HEVLE: Yes. We do that. And  
6 we're working on processes to flag particular  
7 types of defects for more mitigation. I mean, we  
8 have mitigation processes.

9 We have inspection processes to insure  
10 our mitigation is effective. But ILI is -- our  
11 integrity assessment is kind of cutting the cards  
12 after you've done all this thing, just to make  
13 sure that you've got the results you expect.

14 And sometimes you see corrosion where  
15 everything else is telling you you shouldn't have  
16 seen corrosion. And so, we're looking at, hey,  
17 what do we need to do to address that?

18 Sometimes, if the pipe's sitting on a  
19 rock, the only thing you can do is dig it up and  
20 move the rock. And so, there's nothing really  
21 outside you can do.

22 But sometimes, you can add some

1 protection or do a close little survey and make  
2 sure you have all of the levels addressed or do  
3 you a little bit of recoding and save yourself  
4 future digs.

5 And so, that's the component that  
6 we're working right now, to enhance our system.  
7 Does that answer your question?

8 DR. BORENER: Yes. It does.

9 MR. HEVLE: Okay. Alan, yes?

10 MR. MAYBERRY: Hey, Drew. I really  
11 enjoyed your presentation. I was wondering --- I  
12 have a question. I also thought about that.

13 But isn't there -- I mean, there's  
14 pretty good quality and I know there's a standard  
15 technique, like you said.

16 But, wouldn't it be a case of like, I  
17 might trust yours more than I trust like, another  
18 operator's? Because the variables that go into  
19 it, you know, with the cleaning. I mean, there's  
20 so many variables.

21 MR. HEVLE: Yes. It's really going to  
22 be a huge challenge for this committee to do

1 that. I mean, the vendors are doing that  
2 internally.

3 But, it would be difficult to mix  
4 technologies and to mix different types of tools  
5 in order to do that.

6 The analogy I use is if you have one  
7 watch, you always know what time it is. If you  
8 have two watches, you never know what time it is.  
9 Because you're never quite sure which one is  
10 right.

11 You can get into, well, this is more  
12 accurate and I calibrated it more recently and  
13 what have you. But it's really difficult to use  
14 that type of information, the unity plot  
15 information, if you don't have access to all of  
16 the data behind it. You know?

17 Who did the measurement? How did they  
18 do it? What was the speed of the tool at this  
19 location, at the time it was assessed? And, you  
20 know, all of that stuff in here, it's difficult  
21 to make a judgment without that.

22 MR. MAYBERRY: Yes. So we're going to

1 have to start somewhere and see how this is  
2 going. And then I thought also about the future  
3 level, as far as comparing that or, in other  
4 words, all of the data, I guess, coming off of  
5 the tool.

6 But then, you know, I've seen issues  
7 where really the tool may have detected it, but  
8 ultimately, the indications are culled. So --

9 MR. HEVLE: The analyst process within  
10 the tool vendor is just as important as the  
11 capability of the tool because it is -- there is  
12 a lot of expertise required in there.

13 And there are programs and  
14 technologies that are much, much more mature than  
15 others. And so, we're seeing new technologies  
16 come out.

17 And the physics is there and the  
18 electronics is there, but we don't have the  
19 experience of assessing those new things in a new  
20 way. And that's the limitation, in a lot of  
21 cases.

22 MR. HERETH: Can I just clarify or add

1 to what your response was? So, Alan, one of the  
2 things that this standard does is it requires  
3 that you look at the data when you get it back.

4 It gives your initial performance  
5 specifications. So if you're finding data that's  
6 outside, either by speed, by size, by whatever,  
7 whatever your performance specs are, then that --  
8 you can't take that data forward without doing  
9 additional work.

10 And so, then when you go to make a  
11 unity plot, you screen for quality of data on the  
12 front end before you go and make that assessment  
13 of that data.

14 Again, recognizing that you have to  
15 understand the uncertainty in the tool  
16 measurement, as well as the individual readings  
17 and all of the sources of the those.

18 But, that's really what you do in the  
19 performance specification process, which needs to  
20 be done with the in-the-ditch technology, just as  
21 much as it needs to be done with the tool itself.

22 MR. MAYBERRY: Right. So that creates

1 the uniformity, sort of a normalization, if you  
2 will. But then, also I guess that thing that was  
3 referred to earlier, the in-the-ditch tool  
4 measurement, you know, some very good --

5 MR. HERETH: Yes. And I think Michael  
6 referred to it. It's the uncertainty of the  
7 tool, but it's uncertainty on the human side, the  
8 qualifications of the person doing the work,  
9 their knowledge of the tool, their experience  
10 with that tool, whether it's phased or ready or  
11 whatever their using. Part of all this is the  
12 tightening of all of it up.

13 MR. HEVLE: And there's new  
14 technology, laser measurement of profiles, that  
15 will remove some of that error band and ensure  
16 that you have much more precision in those  
17 assessments.

18 So I think that there are  
19 opportunities there for getting better here.  
20 But, I mean, there's opportunities for getting  
21 better everywhere.

22 But, you're right, Alan, that this is

1 going to be a challenge. It's a key performance  
2 requirement for an operator and a vendor. But,  
3 it's hard to apply across an information sharing  
4 approach.

5 MR. BELLAMY: I remember my third  
6 question. So Drew, you talked about how API-1163  
7 can encourage that bilateral information sharing  
8 between operator and vendor.

9 MR. HEVLE: Yes.

10 MR. BELLAMY: But how much are you  
11 sharing what you're finding with other operators,  
12 gas, liquid, or otherwise? And what do you wish  
13 you could get from other operators to help you  
14 with your findings?

15 MR. HEVLE: I think that's a great  
16 question. And I think the answer is, on a data  
17 level, we're not sharing with anybody, at least  
18 outside of the vendors using our scrub data for  
19 qualification purposes.

20 We really don't share that type of  
21 information on a data set-wise, with other  
22 vendors, with other operators, with regulators,

1 unless there's a specific --

2 MR. BELLAMY: Right.

3 MR. HEVLE: But it's unusual. There  
4 are informal processes now to share experiences,  
5 close calls, things like that, that I think  
6 everybody in the industry here has been aware of.

7 We've had some notifications, notice  
8 to operators, alert bulletins, related to  
9 capabilities of ILI. But I think there are  
10 opportunities not only to share understanding.

11 And Eric called it important learnings  
12 -- to share those types of things across the  
13 industry. I think that is what I would be  
14 looking for, not only on close calls, but we  
15 oftentimes don't get all the details in actual  
16 hits, actual incidents.

17 So if there was an opportunity to  
18 really understand the lessons learned across the  
19 whole industry for those types of things, I think  
20 it would be beneficial.

21 MR. BELLAMY: Thank you.

22 MR. HEVLE: Make me a better corrosion



1 engineer.

2 MR. BELLAMY: How could you be better?

3 MR. HEVLE: I lied. I'm not going to  
4 make you up any time.

5 CHAIR BURMAN: That's okay. This was  
6 very helpful. Does anyone else have any other  
7 questions or comments?

8 MR. HEVLE: Thank you.

9 CHAIR BURMAN: This really was very  
10 helpful. Now, just a time check. We do have a  
11 hard stop at 5:00.

12 So we now Agenda Item 4, which is  
13 discussing a bit of IT architecture, and then,  
14 Agenda Item 5, which is really just a reporting  
15 out of the Reports Committee.

16 We can do that which is then really  
17 leading into the next steps. And that's with  
18 keeping in mind at least three of the  
19 subcommittees will be meeting July 2 and fleshing  
20 out things.

21 So, I think we will have a good  
22 handle. Agenda Item 5 should go relatively

1 quickly. And so, I think we can get it done  
2 before the next hour and ten minutes. So we're  
3 now going to turn to Michael.

4 DR. MURRAY: It actually will be for  
5 the IT conversation.

6 CHAIR BURMAN: Oh, yes. I'm sorry.  
7 Yes, Jason.

8 MR. BELLAMY: I wish I could talk  
9 during that. Jason will do a much better job.

10 MR. CRADIT: We'll see.

11 CHAIR BURMAN: Great. Thank you,  
12 Jason.

13 MR. CRADIT: All right. Hello. My  
14 name is Jason Cradit. Many of you know me. I'm  
15 sure you're really excited to talk about IT at  
16 the end of the day.

17 I suspect that may or may not be true.  
18 But we're going to get through it anyway. So, my  
19 name's Jason Cradit, Senior Director of  
20 Technology for a company called TRC.

21 Behind me here is Pete Veenstra. He  
22 is Principal Data Architect, at also TRC. But,

1 of course, the slide behind me says Pivot, not  
2 TRC.

3 And that's just a recent venture that  
4 TRC is off-shooting, so just to avoid any  
5 confusion. We call ourselves Pivot.

6 Part of this conversation, as Eric may  
7 have mentioned is, well -- I'm sorry, not Eric,  
8 Chris Warner mentioned -- has been built with  
9 Mark Zuniga, people from Microsoft and people  
10 from Amazon as well.

11 So there's a lot of contributors to go  
12 into this. This was certainly just not my labor.  
13 We want to talk today about IT architecture and  
14 what the potentials could look like for a system  
15 like this.

16 We've learned a lot from Dan and Mark  
17 and Wen's conversation earlier from AGA. But,  
18 really, what we want to do, is educate and gain a  
19 common vocabulary vernacular around some of these  
20 things and talk about how we think.

21 And we'll talk about that from data  
22 management, Pete will, and how we can process

1 large data sets like this and how we can  
2 visualize.

3 And then, also we've talked a lot of  
4 de-identification and some of the cyber security  
5 requirements. And I'll speak to those things.

6 But one of the important things we  
7 wanted to make sure and mention was that, if  
8 you're not familiar, we're geeks. And this movie  
9 is -- there's a movie called Hitchhiker's Guide  
10 to the Galaxy.

11 And in this movie, they go and they  
12 build Deep Thought. And it's supposed to help  
13 solve the world's problems. And they throw all  
14 of this data into it and all this processing  
15 power.

16 And they go, tell us the meaning of  
17 life, the world, and everything. And then they  
18 get back an answer, after years of waiting, and  
19 the answer is 42.

20 And I think it's a really important  
21 observation in that movie to think about how you  
22 think about what are the questions you're asking.

1           What data are you using and how are  
2           you getting to an answer? We'll touch more on  
3           that later. I thought it was really important  
4           and I'm sorry Dan's not in the room.

5           But this is the official mission of  
6           the VIS. That Dan Cote's team, subcommittee,  
7           came up with. And I bolded and I looks horrible  
8           here, but some words like secure information  
9           sharing systems, collection and analysis. And  
10          for me, being a geek, that's all I really about.

11          Mark, you're worried about the how or  
12          the what. We're thinking about well, what do we  
13          need to do to put all of this together to make it  
14          useful.

15          So we looked at that mission. And  
16          then, also, with the mission, is task statement.  
17          Pete?

18          MR. VEENSTRA: And if you look at this  
19          -- I'm not going to read it because it's at the  
20          end of the day. These tasks are fairly high-  
21          complex objects.

22          And you look at them and there's a lot

1 of details. And if you go to the next slide,  
2 what I tried to do was parse it down to this.  
3 And I still ended up with a ton of stuff.

4 And then, as a data person, I wanted  
5 to look at one more step further and I ended up  
6 with that. And that was just off the cuff.  
7 That's just looking at things from a conceptual  
8 standpoint.

9 So here, we're talking about IT and  
10 databases and data management. And, at some  
11 point, this group is going to have to break it  
12 down into these parts.

13 Because going back to what Jason's  
14 talking about, every time I look at the  
15 proceedings and the documents from here, I'm  
16 saying, what are the questions? What are the  
17 questions?

18 Because the questions that you want to  
19 ask of this system will really drive how the  
20 system is architected. From this, we can go  
21 very, very, very at the next level and say, well,  
22 here's the start of a model that describes this

1 process.

2 And again, the questions will drive  
3 the model. And Drew's presentation was awesome.  
4 Drew's the only guy I know that could pull off  
5 that much words in a PowerPoint, and still keep  
6 people riveted.

7 But what the bottom line comes down to  
8 is every ILI system's going to be different.  
9 Every field verification's going to be different.  
10 Conceptually, they're the same thing and they  
11 relate to each other.

12 But, how we're going to resolve those  
13 things and ask the questions to get meaningful  
14 results is everything.

15 MR. CRADIT: So one of the things I  
16 brought, I put together, it's really a derivative  
17 from Mark's work or maybe it was Eric's, around  
18 all of these different data sets.

19 We've got that great graphic with the  
20 VIS in the center. I changed those to different  
21 icons and I may have added some. And then, by no  
22 means, is this meant to be a comprehensive list.

1           But it was meant to illustrate a  
2 couple of points. All these data sources have  
3 different artifacts. Some are structured and  
4 unstructured data sets. Some could be really  
5 quantitative in nature, like ILI reports.

6           They're taking measurements and things  
7 like that. But then, more could be qualitative,  
8 like safety meetings, like what we saw from ASAP.  
9 Those are more qualitative measures.

10           And you store these things  
11 differently, depending on the data types. And as  
12 Drew pointed out, some have standards. And some  
13 are proprietary to a vendor or technology, in  
14 their native format.

15           And I think as Sherry mentioned, some  
16 -- or, I'm sorry, doctor, I don't know. As you  
17 move up in doing information, that's when it's  
18 probably more useful to share.

19           And then some are really complete and  
20 some are really not. You know, some of you may  
21 not have all of the attributed information or it  
22 may not be available to you.



1                   And all of that's an important point,  
2                   because this is the world we live in. You have  
3                   to start to look at how you combine non-  
4                   structured and structured data together in  
5                   quantitative and qualitative, to get to an end  
6                   result. To get to something that might be  
7                   meaningful beyond 42.

8                   MR. VEENSTRA: So when you look at  
9                   just the idea of data architecture and  
10                  management, there's lots of ways to look at it.  
11                  But there's many facets to the picture.

12                  So if you've got five blind men  
13                  describing an elephant, they're all going to say  
14                  there's a different part of it that is the most  
15                  important or most relevant, because that's what  
16                  they're touching.

17                  That's what they're dealing with. All  
18                  right? So, for us, we sort of broke it down  
19                  into, when we look at IT data management,  
20                  relevant to this problem, we came up with the  
21                  following things.

22                  It's going to probably more than

1 likely, absolutely, positively, need to be,  
2 possibly, in the Cloud. All right? We're going  
3 to have different data types, as Jason said,  
4 static, dynamic and stringing.

5 We're going to have a variety of  
6 database storage technologies that are available  
7 to us. And I would even say we could even take  
8 out the word database and just say storage  
9 technologies.

10 We're going to have different data  
11 transfer protocols, different ways to visualize  
12 it. And we don't spend a lot of time talking  
13 about that, but we do the other parts.

14 There are different repository modes,  
15 how this data works in the environment and how  
16 you access it and design it, and then, how you do  
17 your analytics.

18 For those who attended the  
19 presentation, they talked a lot about how do we  
20 go beyond just the information and drive more  
21 information out of it. And then, of course,  
22 security roles and privacy are going to be big

1 parts of that whole process.

2 So that is how we're going to talk the  
3 remainder of our presentation and focus on those  
4 things. And as Jason said, mostly, it's an  
5 education. It's a background.

6 Here are some of our thoughts around  
7 how to do that and we'll wrap up that way. So,  
8 right now, at least from our opinion, the Cloud  
9 is really the accepted paradigm for implementing  
10 technology at a large scale, for managing a lot  
11 of data, and for really high-level computing.

12 We could go through just the past  
13 years, how many different organizations within  
14 the Federal government have started to move their  
15 stuff up to the Cloud.

16 The real benefits are, it's scalable.  
17 So you can add, compute and storage on demand.  
18 All right? You can scale up to add as many  
19 computers as you need and have the budget, and  
20 the app will tell you four.

21 It's elastic, which means it can scale  
22 up and add additional processors, in terms of

1 power, but also scale out, in terms of adding  
2 additional processes in terms of parallel  
3 processing.

4 And if you take the problem of raw ILI  
5 data and you wanted to analyze it, let's just  
6 say, magically, we found a format that every  
7 single ILI vendor could provide us their raw data  
8 and we really wanted to crunch some numbers on  
9 that.

10 We could do that in either bigger  
11 computers or more computers in parallel. It's  
12 secure. I mean, the Cloud vendors have skin in  
13 the game. They're not going to want to have a  
14 breach on their watch, in their system and  
15 they're in deadlock competition with each other.

16 And so, they're very, very keen on  
17 security. There's ideas of where the data  
18 centers are being stored. I think Microsoft is  
19 now going to store a Sub-C data center.

20 That's about as secure as it's going  
21 to get. I'd like to see how they're going to  
22 pull it off. But they're very keen on it. The

1 idea of storing pieces of information in  
2 different computers at the same time and  
3 recombining it as you need it.

4 And then, the ideally of having  
5 absolute redundancy and backup. And then, it's  
6 cheap. It's typically run from your op-ex  
7 budget, not your cap-ex budget.

8 And you've got a reduced IT footprint.  
9 We use a lot of Cloud computing power in our  
10 business. And we have three people running that.  
11 So it's been very effective.

12 If you look at Amazon, if you look at  
13 IBM, if you look at Google, just as sort of the  
14 big three Cloud players, off the top of my head,  
15 they're offering more consumer-driven analytical  
16 tools.

17 You could set up your own machine-  
18 learning environment on the Cloud with any one of  
19 those vendors, Microsoft as well. Very, very  
20 potent tools for doing all of the things that  
21 you're probably going to need to do.

22 And the other thing is is it's

1 managed, which is nice. Because they're taking  
2 care of a lot of the work that we have  
3 traditional done, as organizations, as entities,  
4 had to hire people to do.

5 And what I like about it is, it's  
6 fairly agnostic. They just provide the  
7 environment. We choose the one that we want to  
8 use. And there's nothing to say that you can't  
9 choose one or more otherwise. So it's a very  
10 flexible, consumer-driven environment.

11 That, I think, is the big takeaway  
12 from that, is as a consumer, as an agency, as a  
13 group, moving down this, you have a lot of choice  
14 ahead of you.

15 And I'm sure any one of those Cloud  
16 providers would be very interested in working  
17 with this group to do what they need to do. When  
18 you look at data, data is either fixed, it's  
19 either being updated, or it's continuous.

20 And the only reason I bring that up is  
21 because it's obvious, but it is how we look at  
22 data. Static data is a snapshot of data in time

1 and space.

2 An inline inspection run is a snapshot  
3 of that pipeline at that time. That data will  
4 not likely be updated. That attic data is  
5 created, it's updated, it changes, it's tracked  
6 historically, and it's retired.

7 So, for me, from a data management  
8 standpoint, I look at a pipeline as being dynamic  
9 data. I install it. I start operating it. I  
10 replace portions of it as they cease to be fit  
11 for service. And then, eventually, it reaches  
12 the span of its design life and I retire it.

13 And then, streaming data is the new  
14 thing. Every time you use your phone and get in  
15 your car and drive, your location is being  
16 tracked, especially with the Google interface.

17 If you have a Google account and  
18 they're looking at where you're driving and that  
19 gives you that really cool traffic pattern on  
20 your Google maps. All right?

21 So that's streaming data which, in  
22 essence, is static, but now, we're getting it at

1 such a volume that we're not able to keep up. I  
2 mean, there's some really good statistics on the  
3 amounts of data that is being generated within  
4 the last year.

5 It surpasses everything that's been  
6 generated prior to this year. And we're looking  
7 at maybe five percent of it, if we're lucky. All  
8 right.

9 Data transfer, the old way of looking  
10 at it was we queried something from a database  
11 and we got results. The problem with the  
12 database is, while there's lots of advantages to  
13 a database, but at the same token, the model is  
14 very fixes.

15 So it's a very fit-for-purpose type of  
16 environment. A little more flexibility is this  
17 idea of an application programming interface.  
18 And I'm not going to go into the huge details of  
19 this.

20 But, if you've consumed a map service,  
21 if you're a GIS user and you consume a backdrop  
22 map, you are consuming, through an API, that map



1 service into your map.

2 And both the client and the server  
3 know how to talk to each other. And I think this  
4 is going to be a big part of your system.

5 You're going to have different  
6 databases, different functionalities, talking to  
7 each other through that. How that data is  
8 exchanged, the two common formats now are really  
9 Javascript Objection Notation, which is JSON or  
10 Extended Markup Language, which is XML.

11 And then, that's great. This is all  
12 just technology. But how it is handed, in a  
13 mechanism that is understood by your system, by  
14 your databases, by your interfaces, by your  
15 users, has to have some sort of idea of a  
16 standard around it to say, let's package this  
17 information in a coherent fashion that these  
18 systems understand and in a standard fashion.

19 Drew talked about that in his  
20 presentation. It's always great having someone  
21 really bring up a presentation before you do  
22 yours so you can use it as examples.

1           But, delivery of data in a common  
2           format, is absolutely critical to any kind of  
3           understanding and processing within a system.

4           Because if you don't do that, if you  
5           don't deliver, here's my list of defects and here  
6           are the tolerances by which they were collected  
7           and how they were validated in the field, you can  
8           do anything with that data, effectively.

9           So one of the examples of that is like  
10          the pipeline open data standard. They're  
11          developing a data exchange specification, which  
12          is going to codify how data is transferred  
13          between systems using JSON or XML.

14          So, simple graphics on how this works,  
15          and that's -- keep hitting them. So I need to  
16          have security to get to a database. I execute an  
17          SQL query. It goes to the database and it  
18          returns me some tables, row and columns is  
19          standard. Keep going on.

20          I've got two different databases. And  
21          I want to take data that's collected here and it  
22          doesn't really fit the way I want to view it

1 here.

2 So what I do is I have security to  
3 both databases and I do something known as an  
4 ETL, an extract, a transform, and a load. And  
5 now, I put it into this system, which could fall  
6 into this paradigm where I could pull out  
7 information in a common format.

8 In very secure, encrypted systems, I  
9 want a way to talk in between those two systems.  
10 And it's usually not SQL or ETL, but it is a way  
11 to go to another system where I have security in  
12 both.

13 And I've got an encrypted message that  
14 goes between. And I think that this is going to  
15 be very important to how you load information  
16 into your system and how you pull back that  
17 information.

18 Because the idea of privacy,  
19 obfuscation, and anonymity, all come into play  
20 around how the data is passed back and forth.  
21 And again, as I said prior to this, the typical  
22 machine, human-readable formats, are JSON and

1 XML.

2 And, of course, with 128-bit  
3 encryption, they can be passed where very few  
4 people on the face of the earth can read them and  
5 decipher them.

6 And the data transfer, at large, from  
7 systems, would typically not just be an API call,  
8 but a transfer of a coherent file that describes  
9 something.

10 And, as I said before -- and in full  
11 disclosure, I'm on the PODS Board of Directors.  
12 But we are building these standards for the  
13 ability to exchange pipeline information between  
14 systems.

15 And we're doing that deliberately  
16 because we think the data model isn't necessarily  
17 as important as the ability to share and transfer  
18 information between the two systems.

19 MR. CRADIT: So through the past ten  
20 years -- and this is from Gartner. It's their  
21 standard sort of data grid and their magic  
22 quadrants. Where you want to be is over here,

1 where you're innovating and exploring beyond just  
2 the doing.

3 Here is the stuff that you know it can  
4 do really well. So people who have a GIS system  
5 managing pipeline data are fully in this  
6 quadrant.

7 And if you start clicking through, you  
8 can start seeing that we have data warehouses,  
9 where's there's a bunch of things there.

10 So I've got a real-time data warehouse  
11 which is looking at my data and presenting it to  
12 me in a way that makes sense, in terms of graphs  
13 and reports.

14 And then, if I keep going -- you've  
15 heard this term recently called a data lake,  
16 where I don't have a single warehouse, but I have  
17 multiple warehouses.

18 And I'm throwing it into an  
19 environment and giving people the ability to just  
20 go out and query this. If you go back, which I  
21 don't want you to, but to those slides where I  
22 did that very simple, conceptual model, the idea

1 of, I have a pipeline.

2 I have an inline inspection. I have  
3 the data that came from that. I have field  
4 verification. They may come from different  
5 systems.

6 And we would like to put them in this  
7 lake where I can stir it all up and then, get  
8 analytics out of it. The traditional data  
9 warehouse sticks formally into what I know.

10 It's very, very rigid. The data lake  
11 is a lot more flexible and allows for some  
12 exploration. And then, this is the next level.

13 This is where, not only are we putting  
14 data out there, but we're wrapping software  
15 around it where we can start understanding the  
16 patterns.

17 So, there's three more. This would be  
18 the very simple. This is my PODS system of  
19 record where I'm keeping my GIS center-lined in  
20 all of the assets.

21 It's very fixed in space, literally.  
22 And then, as I start looking at things like

1       tableau and exploring data with visualization  
2       tools in a different fashion, I can start  
3       possibly slicing and dicing and merging things  
4       together.

5                   But the real gold dust, which was a  
6       great term, comes from a higher level of  
7       analytics. Go ahead. Two more. Right there.  
8       Where we're using the machine to start looking at  
9       the data and evaluating the trends.

10                   Voluntary information sharing group,  
11       you have a lot of hurdles. You have  
12       standardization and normalization and you have to  
13       get people to come to the table to share it.

14                   You have to put the data in a way that  
15       people can look at it. But I think one of the  
16       things you probably need to consider is, how do I  
17       find the trends and correlations that are hidden  
18       in the data way beyond just what I think is going  
19       to happen in my simple user interface.

20                   So the idea of a unity plot that takes  
21       an ILI dig and compares it to the vendor, we want  
22       to develop unity plots for the things that we

1 never, ever thought possible before.

2 And that's where the next level of  
3 analytics goes. Go ahead one more. And the big  
4 part of that is, we want to turn it into natural  
5 language query.

6 Show me this or find me that. And  
7 start exploring beyond just the simple stuff.

8 MR. VEENSTRA: Now, it's the end of  
9 the day. We've been going at this for a good 15  
10 minutes so far and this is a lot of stuff. But  
11 Jason and I really struggled -- how do we present  
12 all of these things?

13 But these are the things that we think  
14 about. These are the things that people are  
15 asking us to think about. These are the things  
16 that we're seeing in a data management paradigm,  
17 constantly, continually.

18 And this is really where it's heading.  
19 If read any tech articles right now, AI, Machine  
20 Learning, blah, blah, blah. If you're not doing  
21 it, you're not doing it.

22 But I think there is some validity in



1 that. So data storage technology, we know the  
2 standard relational database model. We've heard  
3 about the no-sequel big data model.

4 I can describe those for you  
5 afterwards at a local pub, over a beer, if you  
6 want all the details on that. There are other  
7 types of databases, network graph and hierarchal  
8 databases which are amazing for incredibly fast  
9 retrieval.

10 They were implemented in the mainframe  
11 systems, but they're making a resurgence in terms  
12 of how to organize data. There's this idea of  
13 block storage, where I'm not going to structure  
14 my data.

15 I'm not going to have these text  
16 files, but I'm just going to dump it in a  
17 container and wrap some meta data around it and  
18 then query it and have it come up when I need it.

19 And you'll hear of the Amazon S3  
20 storage where you can just dump whatever you want  
21 in there. It's like a file folder on your  
22 computer, literally, and the ability to quickly

1 search and do that.

2 So don't just think when you're going  
3 through the systems, looking at the technologies,  
4 that it's all about rows and columns in a table,  
5 because it isn't anymore.

6 And then, you've also, probably, if  
7 you've read any of the tech stuff, heard the  
8 block chain story.

9 And what I find very fascinating about  
10 that and how it's applicable to this is, when  
11 someone loads data into the system, we can use  
12 the block chain mechanism to A, encrypt that data  
13 and definitely say who submitted it, but hide  
14 that information from the general user, but still  
15 make it part of the data itself

16 It's very advanced, but it's got a  
17 huge amount of applicability to what this group  
18 is doing.

19 MR. CRADIT: So Pete talked a lot  
20 about these high-level concepts. And, at the end  
21 of the day, the working group we're part of and  
22 the subcommittee we're in, or I'm in, is it has

1 to eventually boil down to a recommendation.

2           So it has to be useful and that's what  
3 we're after. And one of the things we started  
4 looking at, he mentioned, Pete mentioned a lot of  
5 different types of databases, structures, and  
6 data storage formats.

7           And this is from some of the major  
8 vendors like Amazon Dynamo DB is a NoSQL  
9 database. And that's very different than SQL  
10 server and incredibly different than Hadoop,  
11 HDFS, or Redshift.

12           And you don't need to worry about what  
13 those logos do or the actual technologies behind  
14 them. But I'll tell you the point I'm trying to  
15 make is, each one of them, you implement for a  
16 reason.

17           And that reason could be because you  
18 want to minimize costs, like the Amazon S3  
19 example. You could store a terabyte for around a  
20 penny. That's pretty cheap. But you're never  
21 going to run analytics on it because it's  
22 incredibly slow.

1                   And that's an important point.

2                   However, it's incredibly scalable. You could  
3                   have petabytes and zettabytes and all of those  
4                   kinds of things.

5                   But you're not going to do anything  
6                   meaningful from it. So there comes a point where  
7                   you want to look at and put the right mechanism  
8                   in, regardless of the brand.

9                   It doesn't necessarily matter. But,  
10                  put the right technology in the right spot to  
11                  make it most useful for the outcomes. And that  
12                  comes with integration.

13                  So the paradigms that Pete introduced  
14                  earlier, this idea of vertical scaling. And the  
15                  idea is that once you have all of your data in  
16                  the right data location, like a database or an S3  
17                  or something like that, that you're going to want  
18                  to process it.

19                  You're going to want to use it to turn  
20                  it into an analytical outcome or to ask questions  
21                  from it. The historical way of doing that is the  
22                  vertical way. I need more RAM. I need more CPU

1 power. Luckily, we don't have seven-year-old  
2 laptops in our organization, but I feel for you,  
3 Drew.

4 But that's not how things really work  
5 anymore. Instead, now, you really focus on  
6 horizontal. And this idea of adding compute  
7 power when you need it and then, turning it off  
8 when you don't.

9 And it's a really important point in  
10 data science and analytics because this is really  
11 expensive hardware. If you need hundreds of  
12 thousands of CPU cores working on a problem, you  
13 want to not pay for that, except for the hour  
14 you're using.

15 So you minimize that. So once you get  
16 into data processing, you really want an  
17 environment that focuses on horizontal scaling  
18 and not vertical scaling.

19 Don't just add it, buy it, you don't  
20 want to rent it kind of thing. So this is an  
21 Amazon example. This is one of the Amazon  
22 examples that I show.

1                   And Pete introduced a lot of these  
2 concepts. So I'll quickly go through it. S3 has  
3 this idea of a bucket. And these buckets could  
4 be ILI data, safety records, and I don't know.  
5 Throw one out.

6                   It could be anything. It could be  
7 incident -- PHMSA's incident database. Really  
8 the point is that these are in a data lake. Non-  
9 similar data types, more or less and I want to  
10 pause for a second.

11                   Mark Hereth actually wrote this stuff.  
12 And I say that -- he didn't do it intentionally  
13 or meaningfully. But, I think -- no. I'm very  
14 serious.

15                   Two meetings ago, he said what started  
16 this whole conversation about why I'm up here  
17 right now. Is he said, isn't there technology  
18 out there where you don't have to worry about a  
19 standard database and worrying about all of this  
20 stuff?

21                   This is the answer. Of course there  
22 is. One of those is S3. This is the Amazon

1 example. Microsoft has one. Google has one.  
2 But, to your point, we don't necessarily have to  
3 know the end to start.

4 And that's what I want to make sure we  
5 all understand. We could just have one bucket  
6 and do this processing before we have the other  
7 buckets established. And that's an important  
8 piece.

9 Once we add that bucket though and  
10 it's in here, we start using this MapReduce  
11 function. And MapReduce, we don't have to use  
12 it. It's just an example.

13 But MapReduce is an opportunity to  
14 scale horizontally, as I mentioned before, to  
15 analyze the data. And MapReduce means map first.  
16 This master node says, look, all of these other  
17 slave nodes, go out and process some data.

18 But I'm going to map the data and how  
19 we join it to you. And then, after you're done,  
20 I'll reduce it back to one common format. And  
21 then, at the end, it goes into a sequel database  
22 or the like or similar.

1                   So the point is, you've taken  
2                   dissimilar data sets. You've run some algorithm.  
3                   It doesn't matter if it's MapReduce. But you've  
4                   done some algorithm on it and some analytics on  
5                   it.

6                   And you've got an information set over  
7                   here that you can then report off of. And it's  
8                   an important point that Sherry and the good  
9                   doctor's name I can't remember, was talking  
10                  about. That there's a difference between storing  
11                  raw data in its raw form and what you potentially  
12                  present at the end.

13                  It's incredibly different, potentially  
14                  very different. It's important to think about  
15                  that because we'll talk about cyber security and  
16                  privacy in a little bit.

17                  But I want to make sure we understand  
18                  that raw data eventually gets processed and ends  
19                  up in something that you then report to the  
20                  public, to operators, to ILI vendors or whoever  
21                  needs to know.

22                  It's an important concept. And, at



1 the end of the day, as we all said, if we could  
2 just simplify it, what we want is to create  
3 actionable insights.

4 We want to be able to get some insight  
5 so we can then use them to save lives or protect  
6 the environment or all of those things. Right  
7 now, we're kind of in this descriptive box here.

8 Right now, we get a report. We  
9 understand it tells us what happened. It doesn't  
10 necessarily why it happened. It just says, this  
11 failure occurred. And that's where we're at kind  
12 of today. But as we mature, we want to get into  
13 diagnostics.

14 Well, why did that happen? What  
15 happened to -- you know, what are all of those  
16 variables that led to this outcome.

17 Well, as we get eventually to that  
18 point, so that we can say all of these variables  
19 ended up in this outcome, that's really where  
20 machine learning kind of comes into.

21 So we can start to predict, well, if  
22 these features happen again, then this will be

1 the outcome. And that's a predictive -- so a  
2 very normal, linear aggression model that many of  
3 you may have seen.

4 But that's predictive analytics. And  
5 eventually, you might want to move to the next  
6 step of saying, if you do this, then this will  
7 happen. Did you have something you want to add?

8 MR. VEENSTRA: No.

9 MR. CRADIT: No? You're good? But  
10 eventually, you want to be able to get to this  
11 point. And I feel like that's kind of where ASAP  
12 is at now, where they can say, if we do this, we  
13 know we're going to reduce this, whatever the X  
14 and the Y are there.

15 Right now, though, I think this  
16 industry and where we're at is really in the  
17 description phase. We saw this. Now we have  
18 this.

19 And we want to mature our industry  
20 into -- to use more intelligence and analytics to  
21 solve those problems. But, of course, cyber  
22 security has to come up and it's 4:15.

1           So I want to briefly go over cyber  
2 security. And I think I want to do this because  
3 I want to make sure we have a common vernacular  
4 as we talk about it.

5           But really, cyber security and really  
6 my background as a geek, I'm a special kind of  
7 geek, is in cyber security.

8           I worked for -- before I was in oil  
9 and gas for a defense contractor for a number of  
10 years, running a cyber security program and  
11 helping inform the organization on how to handle  
12 their environment.

13           But it gets really cryptic and people  
14 get scared. And I want to break all of that  
15 down. And there's really just three facets, the  
16 three-legged stool. I mean, this is cyber  
17 security. The first is confidentiality. And  
18 that's what everybody thinks about.

19           Am I going to get hacked and how do I  
20 control access to only the people who should have  
21 access? And I think that's what everybody stops  
22 and thinks about.

1           Because the other two -- the next is  
2 integrity. And that's -- only the people who  
3 should the opportunity to change the data, can.  
4 And that's an important point.

5           One is, only those that should have  
6 access do. And that's kind of a read on I don't  
7 want to share my information with you or you.  
8 It's mine.

9           And then there's availability. And  
10 this is a denial of service kind of thing. It  
11 needs to be up and usable when I need it. That's  
12 the entire world of cyber security in less than  
13 three minutes.

14           But that's the idea. I mean, we make  
15 it really hard and we make it really confusing  
16 for the common people. But this is things like  
17 encryption and this is things like -- well, the  
18 block change is really more of an integrity  
19 solution because it makes every atomic change its  
20 own unit and it never changes again. And that's  
21 an important point.

22           So the last thing that is kind of

1 wrapping all of this is making sure those things  
2 are true. We want to make sure that only the  
3 people who should have access do.

4 But we also want to know that that's  
5 the case. So there's a second or kind of other  
6 circulating thing around auditing and  
7 accreditation.

8 And it's an important component too,  
9 in cyber security programming. But none of that,  
10 did I really talk about privacy. And privacy is  
11 a lot different.

12 And that gets around the question of  
13 who should have access and to what data? And one  
14 of the things we heard yesterday -- and I wasn't  
15 here, but I heard we heard yesterday, is that  
16 this question of should we store the raw data or  
17 not?

18 And should we store all of the  
19 location information or not? And we get really  
20 close into this question of de-identification.  
21 And de-identification's really important because,  
22 as we all know, there's only a certain number of

1 people who run a pipeline through Tennessee.

2 And only a certain number of people  
3 with an MFL 1.5 tool. And those certain things  
4 could help identify people, whether they're in  
5 aggregate or even just by themselves.

6 So it's really important to think  
7 about though. If you're running a pipeline  
8 through Tennessee and you use an MFL 1.5 tool  
9 against it, like, let's just say, there could be  
10 meaningful information about that.

11 There could be some meaningful  
12 information around soil types, around who the  
13 operator and the ILI technicians or the analysts  
14 that looked at the data, that could be relevant  
15 to safety.

16 But certainly not something that you  
17 want to expose to the rest of the world. So  
18 there's this idea of roles-based authentication.  
19 And certainly, these people aren't meant to  
20 encapsulate all of the people.

21 There's going to be other subgroups,  
22 but I ran out of space in the circle. So this is

1 it. These are the different groups. And I would  
2 suppose a research organization is going to want  
3 all of the data they can get to.

4 This is a group like Mitre or somebody  
5 like that, like the FAA uses, that they use the  
6 data and they discover interesting trends.

7 But they're not necessarily going to  
8 share that, I think as ASAP has said, share that  
9 with other people, like service providers or the  
10 public. Because there's a conflict there.

11 It's not of interest, but it could  
12 help save people. So the key questions, I think,  
13 when we ask about the roles, is what data are we  
14 actually talking about?

15 What's the source format versus the  
16 delivery? Remember, the source was in this  
17 bucket over here and the delivery format -- it  
18 could just be a KPI that shows we're going to  
19 improve safety by this much or these are the  
20 logos of the people who are contributing to the  
21 system and providing information to the public.

22 And it's still meaningful information

1 to researchers and operators. But, as Wen said,  
2 earlier today, earlier today, through HDA, there  
3 needs to be governance. And this question of who  
4 decides who gets access to what and when they get  
5 access, will need to be addressed.

6 I think part of the IT architecture  
7 should come up with that. But I think we also  
8 need help with who should decide what gets  
9 addressed and when.

10 And we want to talk about, just really  
11 briefly here, information and privacy. And we've  
12 talked about obfuscation. So I want to make sure  
13 -- de-identification and obfuscation are kind of  
14 the same thing.

15 But the different processes from a  
16 cyber security professional that you might run  
17 through. PII stands for Personally Identifiable  
18 Information, Mike.

19 And you're all used to that. Your  
20 credit card or your social security and your  
21 healthcare records. You all have those things  
22 and you want to keep them private and to



1       yourself.

2                   And that's the idea of Personally  
3       Identifiable Information. So one of the things  
4       that happens when you start do to data de-  
5       identification or obfuscation is these are five  
6       of the normal practices. So, first is  
7       substitution, where you take a number and you  
8       say, Kinder Morgan, you're a four and Sunoco,  
9       you're a three.

10                   And that's really helpful. Because  
11       now, it doesn't say Kinder Morgan or Sunoco. But  
12       the problem is very obvious. We can all kind of  
13       infer, in a small community, who's three and  
14       who's four.

15                   And so, that may not work. The other  
16       option, and this is a real one, is shuffling. So  
17       while Kinder Morgan may have submitted something  
18       to the system like this, we just shuffle the deck  
19       and say, well, now it says Sunoco.

20                   Because there may or may not be a  
21       point where that matters, that you can't undo  
22       that. But that's a real-life example of what

1 happens in shuffling for de-identification  
2 purposes.

3 Again, there might be some interesting  
4 artifact that says Kinder Morgan, in this area,  
5 with this vendor. That could be interesting.

6 And you've immediately broken that  
7 capability of understanding the data behind it.  
8 Obviously, encryption is one a lot of people  
9 point to. If we just had strong encryption and  
10 we just make so nobody can read it unless you  
11 have a key.

12 The problem with that is people have  
13 keys. I mean, eventually, at some point,  
14 somebody has the key and they can read the data.  
15 And that is what it is.

16 It doesn't add a whole lot of cost to  
17 the system. But people will have the ability to  
18 read the data at some point. So what did you  
19 actually accomplish?

20 Encryption would go back into this  
21 idea of the role space and who can access what  
22 level. And so, having a good, governed structure

1 around it makes sense.

2 I think we're all familiar with  
3 masking as a technique. And that's -- I think  
4 when you fill out your credit card information  
5 online, it gives you the little stars or the X's  
6 and you get the last four and that's all you get.

7 That's a masking technique. And then,  
8 there's nulling which is just don't keep the  
9 data, which is similar to what we heard from, I  
10 think, ASAP and others, is that you just don't  
11 store personally identifiable information, for  
12 the company.

13 So we would just never say, Kinder  
14 Morgan, or -- I keep picking on Kinder Morgan.  
15 But we would just never say that. We would just  
16 never have that information in there or Baker  
17 Hughes or Rosen or whoever.

18 Or whatever we deem as personally  
19 identifiable information that we don't want to or  
20 want to de-identify, we just never store it.  
21 Obviously, the problem becomes, what if there is  
22 something interesting about that data?

1                   But really, you can Google it. I  
2 swear. This is kind of the main ways of de-  
3 identifying data. And I've obviously trivialized  
4 it.

5                   We can get very scientific into these  
6 things. But these are the basic ways of doing  
7 it. And we will need to come up with what is the  
8 one we choose or maybe we use different types for  
9 some.

10                  You know, maybe for an operator or an  
11 ILI vendor, we just use substitution. But, for  
12 nulling, there's certain things we just do not  
13 maintain. And we eventually want to come up with  
14 that taxonomy and make that recommendation.

15                  MR. VEENSTRA: And this goes back to  
16 the whole, what questions are you asking thing.  
17 Because that will determine how all of this stuff  
18 rolls, especially this part here, this slide.

19                  MR. CRADIT: Yes. That's right. So  
20 this is the absolute, one of the byproducts of a  
21 meeting between Mark Zuniga, myself, and  
22 Microsoft. Obviously, it's got the logo -- of

1 how a complete system could work.

2 And as we heard earlier in the budget  
3 stuff, this would be really, really expensive to  
4 go into. But it encapsulates everything we  
5 talked about, data storage, and what are the  
6 types Pete brought up about pods and ILI vendors  
7 and specialties.

8 And then we pump it into a data  
9 storage routine. And this is the real time  
10 versus the static data that Pete introduced. And  
11 then, we're running some analytics on it at some  
12 point.

13 And then we have an analytical data  
14 store which has the information in it. And then,  
15 we present out to somebody. You know, the KDIs  
16 or the Safety Records and hopefully that  
17 improves.

18 And obviously, there's a circle that  
19 goes around. This is an IT picture, not a  
20 process flow. But you understand what I'm  
21 saying.

22 That would be really expensive to use

1 and likely very, very difficult to put in place  
2 anytime soon for any organization. So I wanted  
3 to say we would -- oops.

4 I pressed the wrong button. You can  
5 absolutely start, and this is just a rudimentary  
6 look, of saying A data source goes into A SQL  
7 server warehouse, does some amount of analytical  
8 processing.

9 And this might be ASAP, in a lot of  
10 ways. I mean, they're taking anecdotal and  
11 story-telling kind of data, qualitative data,  
12 holding it somewhere, analyzing it.

13 It sounded like the analyzation may  
14 have been more human. In this case, I had a  
15 computer icon there. But it sounded like they  
16 were more in a, let's review it and see.

17 And, oh, we do have 40 of those types  
18 of things in our database. And then, present it  
19 out to people who need to know. We could do  
20 that. And that's really, really trivial.

21 But, it really, Mark, I think it  
22 shifts the ball into your court. Well, what do

1 we want to start with that would be meaningful to  
2 get back.

3 And maybe I would suggest qualitative  
4 data would make a lot of sense. Whereas,  
5 quantitative ILI data, it takes a different level  
6 of processing and a different level of standards  
7 that the industry doesn't currently have.

8 And so, I might suggest something like  
9 a roadmap approach. And then, you start  
10 introducing other things. One of things that --  
11 I know I see Amy back there.

12 In our subgroup, we talked a lot about  
13 this idea. And Pete mentioned the idea of an  
14 API, to where we might take a bunch of systems  
15 that are data storage mechanisms and wire them  
16 together.

17 So then, if you have a system of  
18 record like pods or a system of record like NPMS  
19 or a system of record like the HEI-1163, where  
20 you do have all of the ILI runs put together,  
21 well then, maybe that record, we should  
22 decentralize it and have all of those be where

1 they live.

2 But then, we run some batch processing  
3 and we have our information stored. It's a  
4 different way to approach. This is a centralized  
5 approach, not the API or decentralized approach  
6 we talked about.

7 But we could do that, if there's too  
8 many hurdles to people thinking about submitting.  
9 I would suggest, if we're going in that  
10 direction, or if we wanted to start with just  
11 qualitative safety information, we would start  
12 with a system very similar to this.

13 And this is the last slide. IT is on  
14 time. I just to make sure that's in the record  
15 somewhere. But really, one of the things, and  
16 it's the punch-line in that movie where Deep  
17 Thought said the answer is 42.

18 And it all comes down to this point  
19 that they quickly decide that their question was  
20 wrong. What they were trying to solve for was  
21 not the right answer. They had all of this data  
22 and they had all of the processing power anybody



1 could ever ask.

2           They had great IT systems  
3 architecture, but they were asking the wrong  
4 questions. And I want to make sure we  
5 understand.

6           There's a lot of hurdles to getting  
7 this done, politically and socially. And I don't  
8 see IT as being a problem to executing it, but we  
9 need to come up with the right questions to ask  
10 and then go from there. So, the end.

11           DR. MURRAY: It's more of a comment.  
12 Thank you both for the presentation. And that,  
13 your last point, underscores what I wanted to  
14 reference earlier about taking it through some  
15 sort of a life-cycle process.

16           Because earlier on in those phases is  
17 where you flush out some of those critical  
18 pieces, what the user's really asking for or in  
19 need of, to help determine what's feasible.

20           Coming up with different alternatives,  
21 back-loading in the costs and other resource  
22 implications. And then, using those things to

1 help drive what you're system development, IT  
2 architecture looks like. So, good point.

3 MR. CRADIT: Thank you, Christie.

4 CHAIR BURMAN: Does anybody else have  
5 any comments or questions?

6 MR. CRADIT: I think Mark.

7 MR. HERETH: I just have one quick  
8 one. First of all, thank you guys. In fact,  
9 when he says, we do before you do, that means we  
10 rode in the long way. What do we need to do to  
11 get the right questions?

12 MR. CRADIT: Right.

13 MR. HERETH: I think that's what I've  
14 got to -- is that something you guys are going to  
15 do in the technology section and the rest of us  
16 don't need to worry about it? Wishful thinking.

17 MR. VEENSTRA: So, I'm not on the  
18 committee. I think I've been invited on one of  
19 the subcommittees.

20 But just sitting back and reading  
21 through the materials, this became patently  
22 evident to me, is you don't know what your

1 questions are. We want -- and that's why we put  
2 that up there.

3 MR. HERETH: So you don't know what  
4 are questions are.

5 MR. VEENSTRA: Well, do you?

6 MR. HERETH: We don't know either.

7 MR. VEENSTRA: Right. No. I'm dead  
8 serious.

9 MR. HERETH: How do we -- what are the  
10 steps that we need to take to get to where we  
11 understand what the questions are?

12 MR. VEENSTRA: Typically, when there's  
13 an existing set of processes, we would just do an  
14 assessment workshop, where you ask the questions,  
15 who's doing it, what are they doing, who do they  
16 talk to, and where do they hand the data off to?

17 It's not necessarily going to be  
18 applicable here. But I think you could draw some  
19 corollaries around that. You have all of these  
20 working groups.

21 I think one of the suggested things is  
22 that they all need to start providing the list of

1       literally-used cases. And Jason and I have been  
2       sort of working this slide deck separately.

3               There was a slide that was not  
4       included. But a big part of it, and Drew  
5       mentioned it, one of the use cases is absolutely  
6       normalization of data. We must have the data in  
7       a standard playing field so that we can do  
8       something with it. And that's esoteric use case.

9               Now, when somebody goes there -- at  
10       the start of the presentation, we talked about  
11       improving pipeline safety and reducing incidents.

12              Well, I think just taking those  
13       statements and saying, how do we do that?  
14       Improving pipeline safety, well, this needs to  
15       respond quickly.

16              But what's it providing to help  
17       somebody make an assessment? Just because we  
18       load 450,000 ILI instructions with 900 million  
19       field verifications -- is the question, should I  
20       use this ILI vendor for my pipeline in Tennessee?

21              I think getting down to those types of  
22       questions is where you need to go. And you've

1 got working groups and you probably don't want to  
2 school one up.

3 So I think all of the working groups  
4 need to be looking at a discussion around the  
5 questions.

6 MR. HERETH: So I guess my question is  
7 --

8 MR. VEENSTRA: You have a question  
9 about the questions?

10 MR. HERETH: And we don't need to  
11 solve it right now, but it seems like that's a  
12 series of steps we need to go through relatively  
13 soon.

14 MR. CRADIT: I might add, if I may,  
15 that there's -- understanding the difference  
16 between qualitative and quantitative data is  
17 really important.

18 Because if we just start with  
19 qualitative, which is kind of what ASAP was,  
20 well, you already know the questions. I mean,  
21 you're say that this went wrong and just hold it.

22 And then, eventually, you get enough

1 of those and you're like, there's something  
2 there. If you're going to address those kinds of  
3 questions, we could start immediately, collect  
4 data, and just keep trend information.

5 And that was clearly the role of a  
6 data scientist or a miter or somebody like that,  
7 or somebody who was just focused on the data. If  
8 you're focused on quantitative -- and Sherry  
9 started the point on this earlier when she was  
10 asking the questions to Drew, do you put this all  
11 in the same database and the idea of the run  
12 after run after run.

13 And the idea of her question, I think  
14 -- yes. She's gone. Would be that, if we have  
15 this outcome with these attributes, it's a  
16 standard linear aggression model to look at,  
17 these attributes come out with that result.

18 But that's a quantitative problem.  
19 And the lack of standards between vendors, if  
20 we're -- but idea is, if we're only looking at  
21 ILI data and looking to correlate that towards  
22 incidents, you can get a whole lot of data and

1 you need a standard to do it.

2 And you're a long ways away. So I do  
3 think there's the low-hanging fruit as a way to  
4 improve safety, the qualitative kind of  
5 questioning, very similar to ASAP and growing  
6 into a location. I think it inherently needs  
7 your questions.

8 MR. VEENSTRA: And I'm going to say  
9 what I don't know. I'm not necessarily sure, but  
10 I certainly will sit down and think about it over  
11 the next couple of weeks or so.

12 And it will come to me and say, here's  
13 the way that you can find your questions. And I  
14 think part of it is just going to be problem  
15 decomposition and some focus on what you're  
16 actually trying to answer.

17 Because there's cool tasks and there's  
18 a great statement. But there's a lot of details  
19 that are not just how we're going to do it, but  
20 what is the system supposed to deliver. So --

21 MR. ROBERTI: And I'm thinking out  
22 loud here. Because it just seemed to be, in the

1 presentation like what FMA does about all of this  
2 ILI data.

3 And you've got trend line against a  
4 particular pipeline. Well, what's important here  
5 in sharing across the industry, is knowing is  
6 there another pipeline of the same age, material,  
7 and characteristics, where the fact that the  
8 assumption that the corrosion rate was X.

9 And it turns out the corrosion rate  
10 was 2X. So a particular pipeline had wall  
11 strength that was far thinner than what we  
12 expected. The ILI data points that out.

13 What we really need to do is to make  
14 sure that that data and that trend line or the  
15 differential gets in the hands of other operators  
16 of pipes or pipelines of the same vintage. Is  
17 that, I mean, is that a thing?

18 MR. VEENSTRA: But I think you need to  
19 go further. I think it becomes a function of  
20 geography just as much as everything else.  
21 Corrosion rates are absolutely driven by  
22 geography.



1           Low parts of the pipeline for internal  
2 corrosion and alkaline soils for the external  
3 corrosion. So you're right. If you solve this,  
4 here's the other examples of where that happened.

5           But this is just to verify then, what  
6 you saw was right. Because now we're not just  
7 looking at your examples. We're looking at  
8 everybody's examples.

9           But then, to find some root cause for  
10 that would involve using the geography at some  
11 level. All right? So I think you're on the  
12 right track, absolutely.

13           I'm not disagreeing with you. But I  
14 think you go further than just the trends.

15           MR. ROBERTI: Right. But my point is  
16 is that a major data dump is not going to get us  
17 where we need to be.

18           MR. CRADIT: Not by itself. You're  
19 right. And I want to make sure we're clear. I  
20 think you're absolutely on the right -- that's a  
21 great start. You get all of that. You said  
22 there were characteristics.

1                   Inevitably, characteristics like  
2                   geography could lead you to identifiable  
3                   information when you put those things together.  
4                   And that's just the elephant.

5                   I mean, we need to talk about it and  
6                   say, at the base level, is that okay, if the  
7                   researchers find it? But the role-based idea  
8                   that not everybody gets to see that information,  
9                   it needs to be clear.

10                  MR. VEENSTRA: And maybe this is the  
11                  way that I think, but if I had a 50 percent wall  
12                  loss, and I verified that fifty percent wall loss  
13                  against 25 other inspections for 25 other  
14                  pipelines with the same technology, well, I think  
15                  I could put some confidence in that 50 percent  
16                  wall loss.

17                  Now, I want to sit down and say, where  
18                  else do I have the potential for that situation,  
19                  not just the validation of 50 percent wall loss.  
20                  So I think there's one of the question marks. Is  
21                  -- sorry. You're not a question mark.

22                  There's one of the questions, Mark,

1 that comes out of the system that's identified.  
2 If I have this result from an ILI inspection with  
3 this technology and this vintage of pipe, how  
4 much truth can I take or how much stock can I  
5 take in the truth of that assessment?

6 And I think that that's one of your  
7 premier questions for the system to start.

8 MR. PARKER: Guys, I want to add too,  
9 before we start putting IT dollars out, it's good  
10 to understand the technology.

11 But your advancing toward a school of  
12 hard knocks until we've really nailed down direct  
13 questions, nailed down the business approach,  
14 before we've started developing.

15 And try to put rigid boundaries here.  
16 I mean, that's not to say you can't modify it as  
17 needed if -- for a good reason.

18 But I would like to establish a good  
19 business case before we start developing. Would  
20 you agree?

21 MR. CRADIT: Absolutely.

22 MR. VEENSTRA: Oh, yes. One hundred

1 percent. Yes. I mean, I think -- please take  
2 that away from our presentation.

3 There's all sorts of amazing  
4 technology and Jason summed it up amazingly well  
5 at the end. We're not worried that the  
6 technology can do what you need to do.

7 It's just out there and it's evolving.  
8 The seven-year laptop story's not going to be  
9 part of the vernacular of this group.

10 MR. HEVLE: Thank you.

11 MR. VEENSTRA: Yes. Dude, you're  
12 immortalized now.

13 MR. HEVLE: This is my eighth year.  
14 It's getting replaced this year.

15 MR. VEENSTRA: Joking aside, Alan,  
16 it's a lot cheaper to produce stuff on paper than  
17 it is to start actually implementing it in  
18 computer systems.

19 And I think what our big plea, I guess  
20 is, is have your business case, have your use  
21 cases, have your questions and explore. I think  
22 part of your discussions within this team really

1 need to be exploring what are the questions. If  
2 I went to this -- you know, maybe that's a  
3 challenge to everybody on this committee.

4 If I went to this system when we had  
5 the system that I think we need, I would ask it  
6 this. And everyone come up with three or four  
7 questions and then, start filtering it together  
8 and make part of your discussions around that.

9 And you'd be amazed. Maybe you'd get  
10 30 questions that everybody needs to ask. Well,  
11 I would say that that's one that is of real  
12 importance.

13 And then you'd get some of the  
14 outliers that you're like, I never thought of  
15 that. All right? So maybe you all will sit down  
16 in this committee and say, if I had this system  
17 the way I would want it, what would I be able to  
18 get out of it?

19 And I think that that -- and it's  
20 discussion. It's group workshops. But all of  
21 your different subcommittees could start  
22 formulating that and roll it up. And send them

1 all to Alan. He'll tabulate them.

2 MS. WHETSEL: Can't you get some of  
3 that from your smart pick data? Some of the  
4 questions that they're asking are paced to begin  
5 with, as a part of the groundwork release  
6 questions. I'm just throwing it out there.

7 MR. MAYBERRY: I'm sorry. I couldn't  
8 hear you.

9 MS. WHETSEL: I just want to -- can't  
10 you utilize smart picks? You know one of the  
11 questions they're asking is smart picks. Don't  
12 you have sort of a groundwork for a start?

13 And I don't want to interrupt your  
14 chain of thought here, but I do want to --  
15 administratively, I want to tell you that it does  
16 take more than three minutes to get an Uber here.  
17 It takes 30 minutes.

18 So if you have to get to the airport,  
19 call an Uber or a taxi right now.

20 MR. BELLAMY: Can I just say  
21 something? If anybody's going with American  
22 Airlines, you'd better check your flights,

1 because I just had two cancels. I can't get a  
2 flight out of here until tomorrow.

3 MS. WHETSEL: Oh, yes. There's some  
4 political issues going on. I'm sorry. I just  
5 really wanted to get this straight. I wanted to  
6 warn you. Thank you. Mike, did you have a  
7 question?

8 MR. BELLAMY: Well, yes. I regret  
9 this afternoon has built to a crescendo. Michael  
10 Bellamy, I regret that we left the best  
11 presentation for the last.

12 Sorry, Drew. And I reason I say that  
13 is that simple notion of what question are we  
14 asking, is extraordinarily powerful.

15 And it might be heretical for me to  
16 say this, but I think we've made -- we've  
17 confused ourselves by allowing us to drift away  
18 from the central question that started this  
19 committee in coming into being in the first  
20 place, which came from questioning about, why are  
21 there so many incidents following an ILI run?

22 That's what lawmakers were thinking

1 about when they called me in to ask me questions  
2 about that. We didn't drive it. What you said  
3 earlier today is not correct. GE didn't drive  
4 this.

5 Lawmakers were already asking  
6 questions because they saw that incidents were  
7 happening after ILI runs. So something was  
8 missing in the ILI process. Got it.

9 So that's where we started. That's  
10 what raised this whole thing. The core of  
11 charter is -- was about ILI until we tinkered  
12 with it.

13 All right. We've tinkered with it.  
14 We're now at a different place. I get it. So  
15 now I suggest we've got maybe two or three or  
16 maybe four different paradigms of questions that  
17 we're going to have to define.

18 And, unfortunately, it's now ten until  
19 5:00. American Airlines is cancelling flights.  
20 Everyone's probably not ready to do this. But  
21 that's the reason I regret we've left the best  
22 until last, in a sense.



1           MR. VEENSTRA: And I want to go back  
2 to your question. Sorry. But your question of  
3 that comparison, why I immediately jumped onto  
4 geography, is because it's a question of  
5 integration.

6           Why are there so many incidences  
7 immediately after I run ILI? And inevitably, it  
8 is the occurrence and interaction of different  
9 forces on the pipeline that weren't being  
10 accounted for.

11           So that's where we go back to the  
12 whole questions and what's driving it. And it's  
13 not meant to derail it. But again, walking into  
14 the committee and reading the materials from the  
15 outside, this is the -- I said it to Jason when  
16 we were putting this together.

17           I said, what questions are being  
18 asked? And, I'm sorry, I don't know the  
19 background, so I take a risk getting up here and  
20 looking foolish.

21           MR. BELLAMY: No. You reverse-  
22 engineered the question perfectly. You deduced

1 it exactly right.

2 MR. VEENSTRA: All right. Well,  
3 anyway, I appreciate it. Both of us do. Thank  
4 you very much for letting us be here.

5 CHAIR BURMAN: I think that was really  
6 good. I think it also shows that we do need to  
7 have the technology subcommittee with the  
8 different subcommittees too, to help fluff out  
9 that.

10 Because I do think that the  
11 integration of that is very key and we're at the  
12 point of needing that. And I also do think,  
13 looking now, going forward, as we're on agenda,  
14 my Item 5.

15 And so, that the next focus, which is  
16 the subcommittee's meeting fleshing out some of  
17 the core, substantive issues that we've  
18 identified from the subcommittee meetings  
19 yesterday and then, today.

20 But also looking at our August  
21 meeting, I do think that we need to -- and I'm  
22 looking for feedback. I do think that we need to

1 have more time for core discussion, especially  
2 because we'll be looking at language.

3 So we're going to need to look at the  
4 language ahead of time to be able to flesh out  
5 some of the core issues and then have time for  
6 our collaborative discussion.

7 And then, seeing -- if we only had one  
8 or two presenters, what is the substance that we  
9 need to help facilitate our committee discussions  
10 as well. Kate?

11 MS. BLYSTONE: Kate Blystone. I think  
12 we should also plan to have an all-committee  
13 conference all between now and then, potentially.

14 CHAIR BURMAN: Right. For a planning?

15 MS. BLYSTONE: Yes. For planning,  
16 just for planning. Yes.

17 CHAIR BURMAN: For planning purposes.  
18 I think that is important. And I do think that  
19 the subcommittee chairs need to have a meeting as  
20 well, a conference call discussion to flesh out  
21 some of the interconnections that we need to look  
22 at.

1 DR. MURRAY: Who's your all committee,  
2 the parent committee or --

3 MS. BLYSTONE: Yes. The big  
4 committee, all of us.

5 CHAIR BURMAN: Yes.

6 DR. MURRAY: Okay. So that would be  
7 more like an administrative meeting that we've  
8 had in the past.

9 MS. BLYSTONE: Yes. When we've had  
10 some of those in the past, it just seems like we  
11 can nail some of the those presentations down.

12 CHAIR BURMAN: And I think it should  
13 be held after the July 2nd meeting, with the  
14 three subcommittees. Because that will help us  
15 in knowing exactly what we're missing and what  
16 needs to be fleshed out more.

17 MS. BLYSTONE: Okay.

18 CHAIR BURMAN: Okay. Does anybody  
19 else have any other comments or thoughts? Dr.  
20 Murray is there anything that we're forgetting to  
21 add?

22 DR. MURRAY: Just, I want to remind

1 everybody that we will be sending out information  
2 regarding the next meeting, hotels. We want to  
3 do that earlier than we've been able to do for  
4 this past one.

5 I want to thank everybody for their  
6 patience and cooperation. I thought the last two  
7 days was extremely beneficial and insightful.  
8 Thanks for working with us. Karen?

9 MS. LYNCH: I just wanted to reiterate  
10 that the reporting committee is going to schedule  
11 a conference call and provide an overview of the  
12 guidance documents that we signed.

13 So I'll try to schedule something for  
14 the next week, week-and-a-half. I know that the  
15 reporting committee or reporting subcommittee are  
16 really (inaudible) --

17 DR. MURRAY: Okay. Thank you.

18 CHAIR BURMAN: And the other thing  
19 that I thought was really helpful is the real-  
20 life examples. And that really put it into focus  
21 for me.

22 And I think we need to think about

1 what ones we can use, in some fashion, in the  
2 report and in how we look forward. And with our  
3 questioning, asking is this meeting the objective  
4 of those examples that resonated with us.

5 DR. MURRAY: And there's one more  
6 important change or point of reference for the  
7 committee. Moving forward, PHMSA will be unable  
8 to retain the court reporter transcription  
9 services.

10 Unfortunately, due to some new  
11 internal directives, we've been asked to hand  
12 that responsibility over to the committees.

13 So that's one of the things that we'll  
14 probably need to talk more about as we move  
15 forward.

16 CHAIR BURMAN: That is, I think, a  
17 difficult issue and one that -- I personally  
18 believe we need a court reporter. I happen to go  
19 back to the transcript.

20 And that has been very helpful to me.  
21 And I know that when we go towards the report and  
22 making sure that we've captured everything, a lot

1 of what we say, I don't think can be done well by  
2 someone who is not a court reporter taking notes.

3 And it does concern me. As much I  
4 don't let the court reporter take a break, I  
5 think that we need to facilitate having a court  
6 reporter in some fashion. So I don't know if  
7 anyone else thinks that that's important. But I  
8 personally think having a recorded transcript is  
9 important.

10 MR. PARKER: Likewise, I do too.

11 CHAIR BURMAN: I don't think it's  
12 something that can be given to the committee to  
13 take care of.

14 DR. MURRAY: So that may be something  
15 to bring up in the administrative meeting.

16 CHAIR BURMAN: We're at the point now  
17 where we really need one. So --

18 MR. BELLAMY: What is it, the budget?  
19 Is the budget the problem?

20 MR. MAYBERRY: No. It's just a change  
21 in the -- how FACAs in general are managed by the  
22 department.

1 MR. BELLAMY: It's not just ours.

2 MR. MAYBERRY: It's not just this  
3 committee.

4 MR. BELLAMY: It's all the FACAs.

5 MR. MAYBERRY: It's a desire to make  
6 them more self-sufficient. But, you know, we're  
7 at a critical stage now. And I agree we need --  
8 you know, it's time to start writing a report.

9 CHAIR BURMAN: And they think it's  
10 something that will also be useful for the  
11 record, in terms of capturing what the committee  
12 thought.

13 Especially, as we have the discussion  
14 on language and the back and forth. You lose it  
15 if you go from -- you know, we had this  
16 recommendation with this language, to then  
17 changing it completely, without have a transcript  
18 to showcase the discussion. I'm concerned about  
19 that. Kate?

20 MS. BLYSTONE: Kate Blystone. Is it  
21 beneficial for us to vote and to write a letter  
22 or something. You know what I mean? Oh, maybe



1 not. Is there something we could do to change  
2 this policy?

3 DR. MURRAY: I would say that it's a  
4 department-wide directive, that I think it's  
5 going to be very difficult to overturn.

6 I think that the committees, the  
7 guidance is for the committees to find other ways  
8 to seek out the services that they so desire.

9 CHAIR BURMAN: So if there was a need  
10 for a court reporter and there was some  
11 facilitation of having a court reporter provided,  
12 that can be done. And that become the monetary  
13 issue. I mean, I personally can't get involved  
14 in seeking out sponsorships for court reporter  
15 services.

16 But I think that's what I'm hearing.  
17 So I would leave it to those who may be on the  
18 committee who believe that they may have the  
19 ability to have a court reporter.

20 And let's talk to PHMSA and follow the  
21 appropriate procedures to have that. But I do  
22 think the next meeting, we do need a court

1 reporter.

2 And we need to figure out a way to  
3 make that happen. And we need to follow  
4 appropriate ethical and legal protocols to do  
5 that.

6 MR. MAYBERRY: Let us take that back  
7 and we'll be talking.

8 CHAIR BURMAN: Okay. Thank you. And  
9 we should have this court reporter, if possible.  
10 All right. Thank you. And thank you all for  
11 everything. You've been great. Safe travels.

12 (Whereupon, the above-entitled matter  
13 went off the record at 4:55 p.m.)

14

15

16

17

18

19

20

21

22

<b>A</b>	
<b>a.m.</b> 1:13 4:2	182:8 240:21 271:22
<b>abilities</b> 130:20 216:3	273:13 300:9 313:16
<b>ability</b> 42:16,18 45:19	313:17 314:18
94:6 115:18 119:19	<b>accidentally</b> 123:16
124:18 130:16 133:20	325:4
134:22 137:13 140:2	<b>accidents</b> 42:11 81:18
157:2 161:22 162:16	120:17 238:4 272:2,4
213:3 362:13 420:13	316:1 392:7
420:17 421:19 425:22	<b>accompanying</b> 109:5
442:17 473:19	<b>accomplish</b> 128:4
<b>able</b> 19:11 26:22 47:4	159:12 359:17 378:7
54:22 67:6,13 69:9	442:19
74:22 92:16 95:2,3	<b>accomplished</b> 366:5
112:4 118:19 128:17	<b>account</b> 220:18 415:17
128:20 129:15 135:11	<b>accountable</b> 271:11
136:9 146:10 153:3	<b>accounted</b> 465:10
161:12 168:21 184:12	<b>accreditation</b> 437:7
196:22 198:20 199:6	<b>accuracies</b> 354:13
201:17 204:10 228:2	<b>accuracy</b> 354:16
251:16 283:11 330:11	361:20 363:7 364:12
391:15 392:8,17	364:18,22 366:2,4,21
416:1 433:4 434:10	385:6,8 386:4,14,15
461:17 467:4 469:3	389:8
<b>above-</b> 368:8	<b>accurate</b> 359:15 365:16
<b>above-entitled</b> 198:1	365:19 368:22 385:12
224:1 352:2 474:12	386:11,18 395:12
<b>above-ground</b> 368:19	<b>accurately</b> 360:17
<b>absence</b> 36:12	364:15
<b>absolute</b> 30:10 62:16	<b>achieve</b> 29:9 104:15
84:17 413:5 444:20	<b>achieved</b> 109:21
<b>absolutely</b> 37:1 40:17	118:14
46:11 54:14 56:17	<b>acknowledged</b> 12:6
110:8 129:19 136:20	<b>acronym</b> 214:12
144:7 160:1 257:11	<b>acronyms</b> 232:15,16
391:18 410:1 418:2	<b>ACSAP</b> 328:22 329:5
446:5 452:5 456:21	<b>act</b> 4:16 38:10 121:15
457:12,20 459:21	134:22,22 146:5
<b>Abstentions</b> 215:7	151:22 177:18 178:3
<b>abuse</b> 146:13 302:20	265:2 387:14
303:12	<b>action</b> 3:18 14:20 35:15
<b>AC</b> 389:16,19,20	37:1 52:2 68:10 87:1
<b>academic</b> 31:2 38:16	107:11 114:15 123:15
<b>accept</b> 246:2 308:3	133:4,8,14,15 135:12
370:20	148:15 149:2 150:1
<b>acceptable</b> 388:14	156:2,8 165:3 177:12
<b>accepted</b> 276:1 294:21	177:18 178:10 179:5
300:13 302:11 304:13	184:20 208:7 239:14
304:20,21 305:8	239:21 240:2 245:21
411:9	246:3 264:21 265:8
<b>access</b> 53:18 65:11	266:7 268:8 270:5
117:12 126:19 129:7	275:10,12,13,14,18
335:6 380:16 395:15	276:2 289:20 296:9
410:16 435:20,21	305:5 306:13,22
436:6 437:3,13 440:4	307:5 318:10,13,15
440:5 442:21	324:12 344:20 373:22
<b>accessing</b> 137:20	<b>actionable</b> 34:4,11
<b>accident</b> 107:4 176:16	392:8 433:3
	<b>actions</b> 46:19 51:6
	68:12 127:10 133:8
	179:10 278:19 304:15
	304:20 333:12
	<b>actively</b> 355:20
	<b>activities</b> 61:10 182:12
	<b>actors</b> 125:14,15
	159:20
	<b>acts</b> 54:11 187:17,17
	<b>actual</b> 21:19 72:11
	240:4 256:15 314:17
	400:15,16 427:13
	<b>add</b> 27:1 47:18 50:8
	54:16 69:22 70:17
	93:4,20 111:4 119:21
	156:11 164:7 188:5
	203:19,21 393:22
	396:22 411:17,18,22
	429:19 431:9 434:7
	442:16 453:14 459:8
	468:21
	<b>add-ons</b> 166:19
	<b>added</b> 73:20 74:1
	104:16 105:22 178:11
	336:13 407:21
	<b>adding</b> 69:21 349:1
	412:1 429:6
	<b>addition</b> 8:15 127:11
	359:7
	<b>additional</b> 67:1 82:19
	86:22 140:12 168:11
	397:9 411:22 412:2
	<b>additive</b> 164:3
	<b>address</b> 17:1 31:18
	72:21 73:4 90:15 94:5
	126:2 133:21 135:20
	137:13 140:2 142:3
	143:20 145:5 179:20
	185:10 187:7 207:17
	380:9 393:17 454:2
	<b>addressed</b> 135:10
	394:2 440:5,9
	<b>addresses</b> 5:4
	<b>addressing</b> 61:14
	144:16
	<b>adequate</b> 50:12 104:4
	104:15 389:21
	<b>adequately</b> 118:22
	<b>ADFO</b> 7:7,12,16,20 8:6
	198:19 213:20
	<b>ADFOs</b> 20:8
	<b>adherence</b> 151:3
	<b>Adjourn</b> 3:20
	<b>adjust</b> 368:13
	<b>administer</b> 221:20
	<b>administrating</b> 50:17
	<b>Administration</b> 1:2,12
	94:17 147:20 182:2
	184:10 190:3 339:19
	<b>administrative</b> 468:7
	471:15
	<b>administratively</b>
	462:15
	<b>administrator</b> 216:7
	<b>admissibility</b> 147:16
	178:5
	<b>admission</b> 149:12
	<b>admit</b> 87:16
	<b>adopt</b> 71:14,19
	<b>adopting</b> 66:6
	<b>advance</b> 40:8 77:7
	<b>advanced</b> 426:16
	<b>advancement</b> 218:20
	<b>advancing</b> 459:11
	<b>advantage</b> 15:5 183:5
	193:1
	<b>advantages</b> 37:7 49:13
	50:9 52:22 416:12
	<b>advertise</b> 324:1
	<b>advertising</b> 328:1
	<b>advice</b> 348:10
	<b>advise</b> 252:6
	<b>advised</b> 249:18 252:1
	<b>advisor</b> 2:7 9:22
	<b>advisory</b> 4:10,14 5:8,21
	9:16 15:18 16:16
	18:16,18,20 19:6
	135:15 137:3 238:10
	336:10
	<b>advocacy</b> 8:20
	<b>affairs</b> 9:10 233:13,18
	<b>affect</b> 278:2 364:21
	<b>afford</b> 168:16 326:16
	<b>afforded</b> 119:22
	<b>afraid</b> 148:15
	<b>afternoon</b> 13:12 14:18
	15:16 110:11 111:1
	213:13,20 224:12
	231:11 463:9
	<b>AGA</b> 52:12,16 53:12,22
	219:4 403:17
	<b>age</b> 284:17 456:6
	<b>agencies</b> 46:20 114:14
	144:12,19 145:1
	176:11 219:8 342:18
	343:10
	<b>agency</b> 59:10,16 60:8
	89:10 91:14 93:1,1
	114:22 120:1 133:7
	133:14 149:3 185:2
	246:3 414:12
	<b>agenda</b> 12:16 14:22
	16:5 115:18 195:8
	196:3,3 229:11
	351:16 401:12,14,22
	466:13
	<b>aggregate</b> 137:21

138:22 249:2 438:5  
**aggregated** 37:2  
**aggression** 434:2  
 454:16  
**aggressive** 19:2  
**AGIA** 113:9 173:16  
**agile** 204:9  
**aging** 377:5  
**agnostic** 414:6  
**ago** 61:22 79:20 81:12  
 154:18,22 181:3  
 182:13 200:9 202:6  
 232:10 233:3 242:19  
 260:5,5 296:18  
 308:12 329:19 332:1  
 337:18 375:14,14  
 430:15  
**agree** 28:20 38:10  
 40:17 41:2,15 47:18  
 50:5 51:9 52:10 59:19  
 62:7 73:6 97:16 98:16  
 99:6 100:16 102:21  
 119:11 136:6 139:17  
 140:9 148:13 151:1  
 159:5 169:17 175:4  
 194:1,4 341:14  
 361:22 382:9 384:3  
 459:20 472:7  
**agreeable** 144:6  
**Agreed** 160:3 382:16  
**agreement** 71:14 101:1  
 229:17 239:15 306:18  
 333:7,13 349:2,5,6  
 361:16  
**agreements** 65:14 95:3  
 144:14 190:9  
**agrees** 65:16 146:9  
**ah** 315:8 341:9  
**ahead** 6:15 184:1 189:3  
 230:15 240:19 255:15  
 264:9 291:18 298:16  
 330:3 336:2 414:14  
 423:7 424:3 467:4  
**Ahava** 2:7 9:21 121:20  
 144:8,21  
**AI** 424:19  
**aimed** 121:8  
**ain't** 257:10  
**air** 17:8 113:4 176:14  
 233:4,5 234:14,15  
 236:15,20 248:16  
 277:4  
**airborne** 320:8  
**aircraft** 234:18 260:7  
 293:6,19 314:15  
 337:11  
**airline** 68:17 238:2,13  
 239:12 252:5 253:8

257:13,15 258:21  
 271:20 287:8,13,17  
 290:17 301:21 303:7  
 322:1 324:5 334:20  
 336:9 338:13 384:7  
**airline's** 232:18 314:10  
**airlines** 2:8,12 13:20  
 230:18 233:14,15  
 234:17 235:4 237:8  
 238:14,15 247:17  
 248:9 258:3 259:5  
 263:9 265:19 269:22  
 279:11 285:2 287:8  
 288:3 296:8 301:15  
 301:16,21 306:2  
 308:16 314:14 323:17  
 323:21 324:3,8  
 325:11 333:9,18  
 334:5,5,7,13 336:16  
 336:20 337:21 338:12  
 462:22 464:19  
**airman** 252:1 306:17  
**airplane** 235:9,11,14,14  
 236:16,21 237:1  
 251:8 260:11,21  
 261:1 282:7 283:15  
 289:13,22 291:2  
 294:7 308:20 309:8  
 315:4 320:2,6,14,15  
 320:17 321:21 325:10  
 340:22  
**airplanes** 237:16 260:1  
 271:21 273:10 283:19  
 286:4 292:14,20  
 308:17 311:14 322:2  
 334:2  
**airport** 237:4 251:15  
 462:18  
**Alan** 1:16 12:18 20:12  
 34:17 41:16 51:7 58:2  
 59:19 62:6,8 92:19  
 94:9 107:19,20 119:4  
 119:10 120:13 135:2  
 136:6 137:1 140:6  
 150:3,5,9 156:12,14  
 164:18,19 171:10  
 178:17 183:13,15  
 394:9 397:1 398:22  
 460:15 462:1  
**Alan's** 120:6  
**Alaska** 263:21  
**alcohol** 177:22 179:12  
 180:3,11,22 303:3,11  
 309:13 314:16 315:5  
 318:20  
**alert** 310:15 311:9  
 320:20 321:17 400:8  
**algorithm** 432:2,4

**aligned** 29:4 76:15 77:9  
 207:15  
**alignment** 22:5,6  
**aligns** 109:2 214:6  
**alkaline** 457:2  
**all-committee** 467:12  
**allayed** 59:18  
**allot** 13:9  
**allow** 109:12 115:17  
 119:17 179:13 186:16  
 250:18 372:16 380:5  
**allowed** 93:11 140:22  
 279:15  
**allowing** 146:13 160:12  
 167:12 174:7 463:17  
**allows** 67:19 109:19  
 204:1 422:11  
**allude** 110:9,22  
**alluded** 108:8  
**ALPL** 203:13  
**altar** 321:14  
**alternate** 19:18 27:12  
 73:18  
**alternative** 119:7 150:5  
**alternatives** 449:20  
**altitude** 236:21 248:17  
 248:18,19,21 249:5,6  
 249:7,16  
**amaze** 213:3  
**amazed** 461:9  
**amazement** 285:15  
**amazing** 323:10 425:8  
 460:3  
**amazingly** 460:4  
**Amazon** 403:10 413:12  
 425:19 427:8,18  
 429:21,21 430:22  
**ambiguity** 145:4  
**amenable** 203:5 356:4  
**amend** 187:20  
**amendable** 356:19  
**America** 10:22 237:4  
 312:9,13  
**American** 2:8,12 7:4  
 13:20 230:18 233:14  
 233:15,19,21 234:17  
 235:4 238:13,15,22  
 246:16 257:3 263:8  
 263:17,19 264:6  
 265:19 271:1,19,20  
 285:5 287:8 306:1  
 333:18 334:7 462:21  
 464:19  
**amount** 46:2 149:6  
 177:4 287:9 315:21  
 332:3 426:17 446:7  
**amounts** 179:7 416:3  
**AMT** 260:7 261:9

281:22 329:11,12  
 341:19  
**AMTs** 308:17 339:8  
**Amundsen** 1:17 10:15  
 10:16 44:8,8 55:20,20  
 191:10,10 192:17  
 194:8 198:7,9,9,17  
 204:13 210:7,12,15  
 211:15,22 212:7  
 214:13  
**Amy** 447:11  
**analogy** 395:6  
**analysis** 32:5 86:8,8  
 91:3 104:21 105:6,8  
 105:13 106:8,16,18  
 107:8 109:12 115:12  
 118:1 130:1 139:18  
 172:13 174:2,6 194:1  
 225:17 267:4 268:12  
 286:14,15 340:3  
 349:16 358:21 367:5  
 371:22 372:10,17  
 380:14,15 389:15  
 391:11 405:9  
**analyst** 255:16,18  
 257:19,21 258:3  
 264:8 265:12,17  
 268:4 396:9  
**analysts** 252:12 438:13  
**analytical** 216:11  
 413:15 428:20 445:13  
 446:7  
**analytics** 8:5 216:13  
 410:17 422:8 423:7  
 424:3 427:21 429:10  
 432:4 434:4,20  
 445:11  
**analyzation** 446:13  
**analyze** 193:15 412:5  
 431:15  
**analyzed** 202:9  
**analyzing** 184:13  
 446:12  
**and/or** 52:20 168:2  
**anecdotal** 446:10  
**angle** 60:3  
**angry** 230:7  
**animal** 308:1  
**annotate** 78:15  
**annotated** 77:6 81:4  
**announcements** 12:21  
 15:16  
**annual** 71:12 158:5  
 365:9 367:1  
**anomalies** 362:15  
 363:6,13  
**anomaly** 363:4 391:10  
 391:21,22 392:3

- anonymity** 54:9 59:9  
60:6 124:20 137:19  
178:22 179:7 217:3  
419:19
- anonymous** 118:18  
136:21 141:1,18  
174:15 193:17
- answer** 30:6 32:9 69:18  
160:7 317:3 394:7  
399:16 404:18,19  
405:2 430:21 448:17  
448:21 455:16
- answering** 42:6
- answers** 128:18
- anti-icing's** 236:19
- anticipated** 227:8
- anticipation** 230:10
- anybody** 4:4 76:13  
133:2 148:21 194:20  
197:17 223:12 228:15  
232:14 239:16 283:6  
310:4 335:15 367:13  
374:15 399:17 448:22  
450:4 468:18
- anybody's** 462:21
- anymore** 258:16 270:9  
287:11 301:14 340:16  
426:5 429:5
- anytime** 446:2
- anyway** 43:9 58:19  
190:21 343:13 367:17  
402:18 466:3
- AOPL** 44:14
- APGA** 52:11 74:3,9
- API** 3:13 44:14 74:17  
201:19,22 203:13  
208:14 210:3 219:4  
219:14 355:16 416:22  
420:7 447:14 448:5
- API-355** 13 378:2
- API-1153** 377:20
- API-1163** 352:18 354:1  
354:22 378:4,9  
384:16 389:2 399:6
- API-63** 352:20
- APIRP** 14:2 81:22
- app** 276:10 411:20
- apparently** 230:4
- appendices** 22:9
- applicability** 426:17
- applicable** 384:10  
426:10 451:18
- application** 175:11  
370:13 371:14,16  
416:17
- applied** 353:3 357:1
- applies** 125:14
- apply** 47:2 149:7  
156:21 188:11 207:20  
352:20 353:14 382:20  
399:3
- Applying** 381:7
- appreciate** 5:19 17:22  
26:10 33:19 39:21  
43:12 45:22 50:5 54:5  
71:6 94:9 110:22  
213:10 246:18 367:17  
466:3
- appreciated** 143:3
- appreciative** 59:6
- approach** 22:13 35:2  
41:20 51:18 109:1,10  
109:16 110:9 119:7  
120:15,20,20 151:8  
173:11 204:1 219:19  
220:11 245:12 273:2  
273:3,19 297:20  
298:8,9 301:22 302:3  
330:9 363:2 399:4  
447:9 448:4,5,5  
459:13
- approaches** 203:22  
335:7,11
- approaching** 342:16
- appropriate** 91:5 99:19  
104:13 170:12 188:18  
188:20 221:17 250:19  
277:20 278:6 332:8  
361:2 473:21 474:4
- appropriated** 221:11,13
- appropriately** 87:18  
284:13
- appropriations** 104:18
- appropriators** 111:12  
111:17
- approved** 21:9,13,18  
29:13 61:21
- April** 13:18 16:1 23:14  
28:7 80:7 231:1  
297:17
- Architect** 402:22
- architecture** 3:15 14:8  
55:2,8 110:10 196:2  
224:15 226:9,14,19  
228:19 401:13 403:13  
409:9 440:6 449:3  
450:2
- architecture/IT** 225:8
- architected** 406:20
- area** 6:15 52:5,8 159:6  
162:10 164:12 175:2  
251:20 442:4
- areas** 22:7 28:17  
132:10 162:14 281:5  
338:3 356:12 363:22  
374:12 379:5
- arena** 134:11,11
- argument** 39:15 67:14
- arm** 341:20
- armrest** 281:12,14  
282:12
- armrests** 284:4
- arrangements** 90:4  
91:10
- arrival** 249:16 272:9,11  
272:20
- arrow** 347:13
- articles** 424:19
- articulate** 146:20 147:8  
162:9 172:11
- articulated** 172:2
- articulating** 145:7
- articulation** 48:8
- artifact** 442:4
- artifacts** 408:3
- as-called-type** 218:16
- as-found** 218:16
- ASAP's** 266:16 269:16  
290:12
- ASAP-** 344:7
- ASAPs** 327:5 348:2
- Asiana** 315:18
- Asias** 66:17 73:21  
86:16 116:14 193:1  
204:19 279:9 280:5  
333:4,7 334:4,8,12,14  
335:6,18
- aside** 460:15
- asked** 42:7 221:6  
225:22 229:21 275:20  
302:10 319:4 337:16  
337:16 353:5 387:9  
465:18 470:11
- asking** 69:1 75:4  
175:17 380:1 404:22  
424:15 444:16 449:3  
449:18 454:10 462:4  
462:11 463:14 464:5  
470:3
- asks** 293:2
- ASNT** 355:1 357:10
- aspect** 207:5 323:1
- aspects** 22:22 99:13  
224:11
- assembly** 229:20 365:4
- assert** 362:18
- assess** 361:6 363:4  
364:1,1,14
- assessed** 395:19
- assessing** 396:19
- assessment** 34:3,9  
64:16 74:21 75:1  
81:16 82:12,18 91:4  
156:18 175:11 359:11
- 361:4 363:17 373:1  
374:21 375:3,10,11  
376:16 383:13 392:18  
393:11 397:12 451:14  
452:17 459:5
- assessments** 363:10  
375:18 392:17 398:17
- asset** 7:3 73:22
- assets** 422:20
- assign** 197:14,17
- assigned** 24:9
- assigning** 197:21
- assignments** 81:6
- assist** 10:1 24:9
- assistance** 81:5
- associate** 8:1
- associated** 192:5 208:8  
357:8 365:22 374:8
- association** 2:12 48:17  
200:18,18,19 392:14
- associations** 38:12  
56:7 57:20 203:13  
204:17 205:2 207:15  
208:15
- assuming** 98:17 130:2
- assumption** 227:12  
456:8
- assumptions** 375:17
- assurance** 141:17  
178:9 294:15 295:1  
316:7 337:1 338:2
- assure** 352:12 367:19  
374:17
- asymptotal** 358:4
- ATC** 274:22 279:11  
328:19 329:4
- atomic** 436:19
- attached** 189:16 190:13  
190:14 191:2
- attachment** 116:16
- attempt** 90:7 149:20  
200:12
- attendant** 199:1
- attendant** 233:3,12  
263:10 281:10 282:6  
282:9 289:15 293:9  
331:14
- attendants** 328:15  
329:15
- attended** 410:18
- attending** 199:2
- attention** 318:22 388:5
- attic** 415:4
- attorney** 2:7 9:22
- attorneys** 279:16
- attract** 388:5
- attributed** 408:21
- attributes** 454:15,17

**audience** 48:2,14 78:5  
88:8 111:9 119:12  
121:3 125:9 142:15  
145:20 186:4 189:5  
194:21 212:18 218:14  
222:17 228:18 342:6  
344:18

**audiences** 218:4,6,13

**audit** 61:10,15 71:12  
154:21 155:5 166:4,6  
166:9 171:2,3,3

**auditing** 166:10 168:22  
437:6

**audits** 153:21 154:15  
162:6

**August** 14:15 16:9,12  
16:15 17:9,12 25:1,19  
76:3 466:20

**August/September**  
23:3

**authentication** 438:18

**authority** 64:21 72:12  
89:20 90:1,3,7,10  
99:22 120:11 129:6  
131:9 144:11 187:9  
187:16,22 188:2  
240:1 251:16 312:22

**authorization** 188:19

**authorize** 104:13

**authorized** 91:8

**authorizes** 104:17  
146:18

**authorizing** 90:21

**automate** 376:17,22  
380:5

**automatically** 291:7,10

**availability** 436:9

**available** 11:22 12:10  
17:9 20:21 55:1  
118:15 145:10 204:5  
236:8 366:13 380:14  
408:22 410:6

**aviation** 3:11 13:15  
23:21 89:9 134:11  
184:20 230:19 242:21  
244:8 285:4,10,16  
286:5 318:10 319:16

**avoid** 69:11 143:22  
403:4

**avoidance** 30:12,17  
31:20 32:5 54:9 84:12

**avoided** 30:20

**awaiting** 204:15

**award** 72:1

**aware** 15:17 31:13  
83:17 162:19 188:16  
305:3 316:19,20  
349:14 400:6

**awareness** 58:9 213:17  
214:3 215:20 217:6,7  
222:14

**awesome** 323:12 407:3

**axis** 385:18

**aye** 215:5

**eyes** 215:6

---

**B**


---

**B** 62:10

**back-loading** 449:21

**backdrop** 173:13  
416:21

**background** 22:3 29:11  
231:3 233:2,16  
234:10,13 309:19  
411:5 435:6 465:19

**backing** 255:5,10

**backseat** 247:2

**backstop** 173:7

**backup** 215:10 413:5

**backward** 16:2

**backwards** 131:1

**bad** 70:6 157:15 158:3  
159:20 233:22 234:6  
236:2,16 237:20  
240:11 247:12,15  
287:14

**badge** 245:19

**badges** 245:19

**bag** 296:19,20 297:8

**bags** 296:21

**Baker** 11:9 210:1  
443:16

**balance** 146:12,18  
147:8 253:11

**balances** 160:3

**ball** 17:18 108:11  
185:22 446:22

**band** 398:15

**Baptist** 321:13

**bar** 290:5

**Barbecue** 272:13

**bargaining** 190:9

**barrier** 89:19 90:9,14  
104:1 114:2,4,19  
121:4,5 133:3,5 147:9  
148:17 176:6 191:19

**barriers** 43:3,10 48:22  
55:11 82:12 89:14,16  
89:17 91:16 104:11  
127:6 147:10 205:5  
208:1 212:4

**base** 26:6 259:9 458:6

**baseball** 251:10,13

**based** 109:14 115:12  
116:3 121:17 130:1  
143:6 146:6 147:11

166:12 187:22 205:15  
290:21 360:19 364:19  
366:18 370:21 381:6

**baseline** 54:14 375:9  
379:3

**baselines** 375:8

**basic** 185:21 376:6  
383:15 444:6

**basically** 62:2 182:7  
201:10 264:6 291:15  
292:21 298:7 335:14  
346:14

**basing** 223:3,3

**basis** 45:2,5 116:9  
133:16 147:12 365:9  
367:1 374:3

**batch** 448:2

**Battams** 2:7 9:21,21  
121:20,20 122:9  
124:2,8 144:8,8 145:6  
145:13,17

**bear** 18:10

**bearing** 286:5

**bearings** 285:3

**beat** 52:9

**beautiful** 277:8 283:17  
295:8 309:5 345:8

**beauty** 202:22

**becoming** 368:21

**beer** 307:14 425:5

**began** 81:5

**beginning** 22:15 24:3  
384:5

**begs** 152:6

**behalf** 25:14 39:15  
276:18

**belabor** 168:13

**believe** 80:6 88:22  
152:5 221:10 234:2  
247:16 278:14 291:1  
295:16 303:8 334:13  
346:2 470:18 473:18

**Bellamy** 1:17 11:8,9  
209:22,22 210:8,14  
210:16 212:6 384:14  
384:14 399:5,10  
400:2,21 401:2 402:8  
462:20 463:8,10  
465:21 471:18 472:1  
472:4

**belly** 290:4

**benchmark** 130:12

**benchmarking** 130:14

**bend** 274:3 315:4  
360:13

**beneficial** 97:21 106:16  
171:5 377:11 400:20  
469:7 472:21

**benefit** 37:21 69:15,16  
73:20 74:18 80:18,19  
104:22 106:9,18  
287:18,19 319:10  
334:4 344:17

**benefits** 37:22 41:6  
48:20 54:1 104:6  
113:14,18 170:17,19  
227:21 287:3,4,17,18  
287:22 411:16

**best** 10:18 30:18 56:3  
75:15 76:16,17 77:1  
77:12,14 79:3 80:2,22  
173:2,4 186:7,21  
191:16 195:4,8 198:6  
198:10 199:19,21  
200:22 203:11 205:11  
207:11,17 208:12  
211:17 219:16 270:22  
322:6,7 323:3 338:16  
463:10 464:21

**bet** 41:7,15 244:4 269:3  
282:16 294:12 332:9

**better** 33:17 39:20  
59:21 63:8 87:12 88:4  
90:8 107:17 120:19  
129:14,14 142:20  
152:2 172:1 232:6  
240:14 241:18 265:22  
270:16 283:18 285:12  
287:1 299:10 310:21  
338:4 380:19 386:15  
398:19,21 400:22  
401:2 402:9 462:22

**beyond** 151:19 375:5  
409:7 410:20 421:1  
423:18 424:7

**bias** 331:7,8

**bible** 361:15

**big** 57:13 60:7 68:5,7  
86:19 169:7 218:15  
239:5,11 240:6 244:4  
247:6,10 251:10  
259:13 260:11 264:13  
272:5 285:2 298:6  
300:3,11 302:7,18,19  
303:21 304:11 305:6  
307:21 310:5 311:4,7  
311:9 315:9 317:1  
320:9,10 321:6,7  
347:13 353:9 366:14  
369:6 373:11 381:3  
390:5 410:22 413:14  
414:11 417:4 424:3  
425:3 452:4 460:19  
468:3

**bigger** 39:9 412:10

**bilateral** 399:7

- Bill** 1:20 7:2 210:18  
**bind** 144:18  
**bird** 60:3  
**bit** 13:20 14:8 28:4 29:6  
 36:4 59:9 60:17 62:15  
 63:22 69:22 75:17  
 79:8,16 93:14 97:18  
 108:5 113:3 122:14  
 131:3 134:6 148:13  
 151:20 156:16 157:16  
 159:5 164:3 169:18  
 171:12 196:21 198:12  
 200:5 211:9 215:10  
 218:3 227:4,18 231:2  
 231:7 232:6,11,19,22  
 236:10 238:8 239:21  
 250:9 264:15 266:13  
 294:13 300:20 322:22  
 323:10 331:3 341:5  
 362:5 365:16 394:3  
 401:13 432:16  
**black** 292:20 300:6  
**Blacksmith** 8:22 73:15  
 117:18 160:5 165:14  
 175:4  
**blah** 424:20,20,20  
**blame** 189:13,16  
 190:11 261:9  
**blank** 63:18 310:17  
**blanket** 181:16  
**bleed** 236:15,20  
**blind** 87:16 409:12  
**blindspots** 310:10  
 311:15  
**block** 425:13 426:8,12  
 436:18  
**blocks** 34:20 343:4  
**blood** 179:19  
**blow** 243:14,14  
**blowout** 243:14  
**blue** 18:16 199:1  
 237:16 263:22  
**blues** 272:13,14,19  
 273:1,1,4,5,5,7  
 316:20  
**blur** 165:11  
**Blystone** 1:18 8:17,18  
 39:4,4,17 97:22,22  
 102:1,1,10 163:16,16  
 262:15 263:3,16  
 264:19 265:9,11  
 266:4,9,21 267:17  
 268:1 269:1 322:8,8  
 322:11,16,20 323:5,8  
 323:19 325:12,18,21  
 328:4 467:11,11,15  
 468:3,9,17 472:20,20  
**board** 26:19 29:21  
 75:21 117:10 128:2  
 130:9 420:11  
**boards** 130:4  
**boat** 70:11 193:22  
**Bob** 10:13 28:1  
**body** 22:14  
**Boeing** 292:12 320:11  
 320:18 321:4,5,15,16  
**boil** 89:13 427:1  
**bolded** 405:7  
**bomb** 273:8  
**bond** 36:8  
**books** 95:20  
**Borener** 2:8 8:3,4 66:15  
 66:16 67:15 73:19  
 85:20,20 105:4,4  
 106:1,21 128:12  
 130:7 184:15,15  
 192:13,14,18 194:7  
 194:10 291:19 292:1  
 292:6,9,16 293:20  
 294:3,11 390:11,11  
 390:21 391:14 392:5  
 393:1,4 394:8  
**borrowing** 96:11  
**boss** 58:15,18 260:6  
 261:4 269:9 271:14  
 290:7  
**bottom** 17:10 188:5  
 205:9 387:1 407:7  
**bought** 230:5  
**bound** 145:2  
**boundaries** 54:10,12  
 184:7 459:15  
**box** 51:20,22 53:13  
 433:7  
**boxes** 292:20 293:4  
**brag** 278:15  
**brainstormed** 217:15  
**brakes** 236:18 285:3,13  
**brand** 362:8 428:8  
**brand-new** 371:13  
**Brazil** 313:17  
**breach** 159:5 412:14  
**break** 13:6 15:10 42:22  
 45:15 47:6 48:21  
 195:20,21 280:20  
 281:7 370:3 406:11  
 435:14 471:4  
**breakers** 236:12  
**breaking** 67:22  
**breaks** 45:18  
**breathing** 236:16  
**brick** 182:9  
**Bridge** 225:13,21  
**Bridge's** 225:18  
**bridging** 213:7  
**brief** 3:2 6:3 210:2  
 301:22,22 302:4,4  
 307:13 339:9  
**briefed** 280:9,11 300:21  
 308:12 321:9,10  
**briefing** 300:18  
**briefings** 310:21  
**briefly** 18:11 81:12  
 435:1 440:11  
**briefs** 339:12  
**bright** 158:7 298:6  
 332:17  
**bring** 14:18 15:4 37:20  
 55:21 69:2 164:14  
 216:17 222:9 256:7  
 267:13 268:16 319:19  
 343:17 414:20 417:21  
 471:15  
**bringing** 15:7 21:15  
 76:1  
**brings** 73:20  
**broad** 54:10,11 97:12  
 128:6 181:16 219:13  
 391:11  
**broadcast** 279:1  
**broadcasting** 279:5  
**broader** 14:9 100:10,13  
 123:7 126:1 165:18  
 203:16 382:8 389:16  
**broadly** 165:17 211:9  
**broke** 318:8 409:18  
**broken** 442:6  
**brothers** 57:2  
**brought** 15:4,12 59:16  
 165:5 266:6 270:13  
 299:8 407:16 445:6  
**Brown** 199:3 226:3  
**Bryce** 199:3 224:20,21  
 226:3  
**BSEE** 256:12,12 343:4  
 343:4  
**Bu** 261:8  
**Buchanan** 1:18 10:13  
 10:13 57:12  
**bucket** 101:13 338:2  
 430:3 431:5,9 439:17  
**buckets** 430:3 431:7  
**buddies** 285:17 347:18  
**buddy** 102:4  
**budget** 7:19 49:8 104:9  
 104:22 106:9 108:3  
 108:13 112:11 411:19  
 413:7,7 445:2 471:18  
 471:19  
**budgeting** 76:21  
**build** 46:21 50:13 193:8  
 244:5 260:16 299:18  
 404:12  
**building** 6:8 15:6 18:3  
 34:20 63:10 87:2  
 222:7 241:6 245:13  
 273:18 366:6 420:12  
**buildings** 330:19  
**built** 116:21 189:12  
 252:2 257:18 264:22  
 292:12,14 301:15  
 375:17 403:8 463:9  
**bullet** 31:19 204:15  
 206:2 208:14 219:17  
 221:19 225:6  
**bulletin** 135:15 137:3  
 178:14  
**bulletins** 400:8  
**bullets** 30:1  
**bunch** 182:15 273:10  
 282:7 392:14 421:9  
 447:14  
**burgeoning** 182:13  
**Burman's** 143:1  
**burned** 264:12  
**burst** 273:8  
**bus** 340:15  
**business** 3:8 13:1  
 84:21 114:10 238:2  
 252:5 314:11 323:22  
 413:10 459:13,19  
 460:20  
**bust** 340:13,16  
**busy** 285:13 327:6  
**button** 392:1 446:4  
**buy** 57:17 285:6 429:19  
**buy-in** 239:15,22 240:3  
 327:21 348:13,13  
**buzzword** 339:5  
**byproducts** 444:20

---

**C**


---

- C** 62:11  
**C-130** 234:14  
**cabin** 236:21 280:22  
 281:9 283:1 349:7  
**calculate** 388:19  
 389:19 392:18  
**calculating** 388:15  
**calibrated** 395:12  
**calibrations** 377:17  
**California** 319:16  
**call** 3:4 11:17 36:12  
 43:16 82:13 160:13  
 183:21 184:7,10  
 189:9 190:10,12  
 207:2 223:18 252:1,5  
 269:7 272:11 275:6  
 277:14 279:9 281:6  
 289:6 290:9 294:16  
 302:17 306:16 308:19  
 319:2,11 321:14

325:16,19 326:1  
 332:20 337:17 338:7  
 339:5 343:11,11  
 344:21 345:7 351:4  
 358:7 385:12 390:22  
 403:5 420:7 462:19  
 467:20 469:11  
**called** 43:22 90:11  
 172:3 225:12 242:14  
 272:18 291:7,14  
 313:15 343:3 349:5  
 355:14 385:9,19  
 386:1 400:11 402:20  
 404:9 421:15 464:1  
**calling** 79:12 174:3  
 217:10 318:13 324:18  
**calls** 183:18 184:13  
 385:18 400:5,14  
**camel's** 112:6  
**campaign** 56:4 217:20  
**cancelling** 464:19  
**cancels** 463:1  
**canned** 267:9  
**Cap** 272:20  
**cap-ex** 413:7  
**capabilities** 42:19  
 354:16 359:5 369:1  
 374:10,21 400:9  
**capability** 396:11 442:7  
**capable** 145:11 216:10  
 359:9 360:12  
**caps** 43:21,21  
**capture** 80:3 96:7 113:5  
 374:22 375:16  
**captured** 81:15 118:13  
 118:22 377:22 470:22  
**captures** 162:2  
**capturing** 377:6 472:11  
**car** 15:12 247:3 415:15  
**card** 12:7 46:5 68:3  
 181:6 242:5 260:16  
 261:11,13 271:8  
 316:19 326:21 440:20  
 443:4  
**cards** 393:11  
**care** 12:8 112:4 139:3  
 171:1 197:18,21  
 313:5 315:7 414:2  
 471:13  
**career** 83:16  
**careful** 127:4 346:6  
**carefully** 130:19 147:8  
 171:13 214:1  
**cargo** 307:20  
**Carl** 96:11  
**Carnival** 254:4  
**carpool** 195:15  
**carrier** 315:14

**carriers** 184:20 267:21  
 288:5 301:1 312:9  
 335:13  
**carries** 215:8  
**carry** 296:20 297:4  
**cart** 34:7  
**carve-out** 156:3  
**carve-outs** 177:16  
**carving** 95:12  
**case** 6:7 59:16,17 60:8  
 61:19 67:2 80:9,20  
 81:21 111:12,19,21  
 111:21 135:15 147:19  
 181:22 187:19 227:3  
 248:15 251:21 256:4  
 277:12 291:4 292:22  
 394:16 437:5 446:14  
 452:8 459:19 460:20  
**cases** 84:5 86:11  
 187:10,12 396:21  
 452:1,5 460:21  
**casings** 156:21  
**casts** 97:9  
**cat** 51:13 85:15 214:12  
 215:8  
**catastrophic** 176:15  
**catch** 196:11 232:7  
**catchall** 131:18  
**catching** 248:10  
**categories** 79:6 103:11  
 215:20  
**categorized** 215:19  
**cathodic** 372:13,18  
**cats** 214:16  
**caught** 44:5 332:13  
**cause** 74:13 85:7 245:1  
 297:7 360:15 367:4,8  
 372:17 389:14 457:9  
**caused** 80:13 84:1  
 177:21 230:3  
**caveats** 335:20  
**cease** 415:10  
**celebrations** 17:16  
**center** 1:12 85:5 202:21  
 207:2 209:1 407:20  
 412:19  
**center-lined** 422:19  
**centers** 412:18  
**central** 30:2 463:18  
**centralized** 448:4  
**certain** 52:22 69:8  
 102:17 111:16 126:11  
 127:10 128:4 151:2  
 160:21 167:22 187:10  
 187:12 244:20 267:9  
 294:4 335:19 388:12  
 437:22 438:2,3  
 444:12

**certainly** 26:13 27:22  
 45:17 48:17 54:1  
 59:12 71:6 90:6 92:18  
 108:15 111:12 136:5  
 187:20 203:6 231:3  
 232:14 347:8 387:6  
 403:12 438:16,19  
 455:10  
**certificate** 220:21 246:2  
 276:2 288:20 305:5  
 312:18 318:19 319:18  
 345:12  
**certificated** 345:16  
**certificates** 345:13  
**certification** 216:21  
 291:21 292:7 357:12  
 358:14  
**certified** 292:5 328:17  
**cetera** 220:3 283:13  
 349:7 357:16 369:22  
**CFR** 269:7,18  
**chain** 84:2 361:10  
 426:8,12 462:14  
**Chair's** 165:15  
**chairing** 20:10  
**chairman** 9:1,2 10:5,18  
 25:13 55:14 73:15  
 169:17  
**Chairperson** 213:15  
**chairs** 467:19  
**challenge** 38:21 47:5  
 108:5 148:9 153:20  
 157:2 172:21 383:8  
 394:22 399:1 461:3  
**challenges** 58:10  
**challenging** 383:3  
**champion** 49:7  
**champions** 104:11  
**chance** 26:15 231:22  
**chances** 329:3  
**change** 25:8 49:8 55:22  
 56:4 57:11 67:20  
 71:11 97:3 120:12  
 183:19 214:3 249:15  
 251:19 260:8,17,18  
 260:21 261:3,7,16  
 273:15,22 274:1  
 278:3,6 300:12  
 301:21 302:7,7  
 310:18 315:20 317:13  
 317:14,16,19,20  
 321:20,22 322:4  
 327:21 337:3,6,7,10  
 342:3 348:12 375:11  
 375:12,12 377:16  
 436:3,18,19 470:6  
 471:20 473:1  
**changed** 59:22 102:19

102:20 132:11 245:7  
 259:18 273:20 278:15  
 300:7 339:16 347:21  
 351:8 407:20  
**changes** 71:10 93:17  
 94:5 199:10 225:5  
 290:20 355:21,22  
 374:14 415:5 436:20  
**changing** 51:19 283:22  
 322:2 472:17  
**characteristics** 359:6  
 359:21 360:7 363:6  
 371:20 456:7 457:22  
 458:1  
**characterization** 40:1  
 62:7  
**characterize** 75:3  
**characterizing** 214:1  
 363:13  
**charge** 197:15 365:20  
**chart** 273:15 276:21,22  
 277:16 304:5 370:8  
**charter** 464:11  
**charts** 301:3,4  
**cheap** 413:6 427:20  
**cheaper** 460:16  
**check** 63:18 109:19  
 195:6 292:17 293:7,7  
 293:7 306:17 320:21  
 340:9,12 341:6 371:2  
 401:10 462:22  
**checked** 296:2 341:1  
**checking** 335:9  
**checklist** 260:16  
 290:22 291:4,6,8,10  
 291:12,13,15,18  
 293:4 295:5,7,11,11  
 295:17  
**checklists** 290:18,18  
 291:14  
**checks** 368:8 369:18  
 370:21  
**cheers** 17:3  
**CHERYL** 2:13  
**Chevron** 254:3  
**Chevrons** 343:1  
**Chicago** 308:14  
**chief** 8:4 20:13 229:16  
**chill** 161:21  
**China** 234:19 235:15,20  
 237:1 252:11,15  
 261:2 297:4 312:16  
 312:17 313:4 330:8  
**Chinese** 312:19  
**choice** 33:14 414:13  
**choose** 414:7,9 444:8  
**chooses** 193:17  
**Chorus** 215:6



**Chris** 10:3 14:7 31:5,6  
 74:20 87:5 115:22  
 116:11 196:10 198:21  
 225:1 403:8  
**Christie** 1:13 2:6 4:11  
 9:15 319:3,4 450:3  
**Christie's** 111:2 184:17  
**CHRISTOPHER** 2:4  
**chunk** 216:1  
**chunks** 111:16  
**church** 321:13  
**CIO** 105:14  
**circle** 438:22 445:18  
**circles** 201:9  
**circuit** 236:12  
**circular** 238:10 336:11  
**circulating** 437:6  
**circumstances** 130:10  
 306:6  
**cite** 62:4  
**city** 252:20 299:1  
**civil** 350:20  
**civilian** 292:20  
**clarification** 29:6 54:18  
 165:15  
**clarifications** 203:20  
**clarify** 77:4 90:9 143:5  
 396:22  
**clarifying** 220:13  
**classify** 192:4 209:2  
**classifying** 191:22  
**clause** 47:2,12 145:3  
**clean** 360:6  
**cleaning** 394:19  
**clear** 26:20 27:5,5,6  
 41:19 48:8 56:21  
 64:19,22 73:2 89:22  
 90:2 95:8 100:8,19  
 103:10 109:20 117:13  
 119:6 120:14 124:11  
 125:5 127:2 136:17  
 142:7 143:8 146:1,22  
 149:18 153:16 160:1  
 269:14 273:1 298:7,9  
 309:5 341:4 381:5  
 384:4 457:19 458:9  
**clearly** 38:14 83:7  
 101:9 120:8 142:7  
 145:7 146:20 169:22  
 300:8,10 338:2  
 356:12 454:5  
**click** 16:3 392:1  
**clicking** 421:7  
**client** 417:2  
**Cliff** 199:4 201:13 202:6  
**climb** 249:3,8  
**climbed** 299:5  
**close** 176:15 183:17,21

184:7,10,13 185:9  
 189:9 190:10,12  
 285:9 295:8,21 356:7  
 372:13 387:21,22  
 394:1 400:5,14  
 437:20  
**closed** 16:14 268:11  
 275:9 317:6,9 333:10  
**closed-loop** 291:7  
**closely** 110:5 165:2  
**closes** 291:7  
**closing** 3:18 14:21  
**cloud** 309:5 410:2  
 411:8,15 412:12  
 413:9,14,18 414:15  
**clowns** 311:12  
**coach** 275:7  
**coaching** 275:6  
**Coast** 256:13  
**coating** 10:14  
**cobble** 108:7  
**cockpit** 236:9,12  
 249:14 297:9 310:7,7  
**code** 97:7 158:13  
 166:18 220:7  
**codes** 71:3  
**codify** 418:12  
**coffee** 293:10  
**cognizant** 112:9,13  
 195:13  
**coherent** 417:17 420:8  
**collaboration** 4:19  
**collaborative** 34:4  
 51:22 467:6  
**colleague** 232:21  
**colleagues** 15:13  
**collect** 162:17 173:22  
 454:3  
**collected** 202:8 390:16  
 392:15 418:6,21  
**collecting** 161:20  
 171:22  
**collection** 91:3 107:2  
 161:21 186:11 405:9  
**collective** 190:8  
**college** 242:1,7  
**color** 134:7  
**colors** 310:18  
**columns** 418:18 426:4  
**combine** 124:6 372:10  
 409:3  
**combined** 125:12  
**combining** 124:4  
**come** 13:11 21:5 24:5  
 38:3 46:22 58:13 75:4  
 75:16 77:15 84:10  
 86:7,11 92:6,16 94:20  
 94:21 99:18 105:14

143:12 156:10 161:6  
 164:22 173:10 185:11  
 191:14 195:18 196:20  
 201:3 226:17 227:1  
 243:5 251:8 254:5,7,8  
 254:12 257:6,7  
 265:18 266:17 279:12  
 279:16 281:16,22  
 282:2 289:20 298:9  
 301:11 308:2 311:2  
 321:12 322:3 324:10  
 331:20 347:18 374:4  
 396:16 419:19 422:4  
 423:13 425:18 434:22  
 440:7 444:7,13 449:9  
 454:17 455:12 461:6  
**comes** 42:14 45:12  
 63:6 72:10 84:13  
 94:15 106:10 173:7  
 204:2 207:20 229:13  
 236:20 240:17 262:16  
 263:2 266:3,6 268:13  
 272:14 285:10 292:22  
 332:7 347:15 369:12  
 369:12 377:9 407:7  
 423:6 428:6,12  
 433:20 448:18 459:1  
**comfort** 111:17  
**comfortable** 126:17  
 388:2  
**comfortably** 25:19  
**coming** 13:13 14:1,15  
 87:14 110:6 116:8  
 122:6 127:13 135:6  
 135:11 224:16 226:19  
 233:17 237:7 240:18  
 242:22 243:2 246:18  
 272:15 284:18 316:13  
 334:3 337:8 338:12  
 396:4 449:20 463:19  
**command** 75:10  
**commande** 209:9  
**commend** 78:7 183:7  
**comment** 12:8 23:6  
 34:18 44:6 46:1 50:5  
 57:12 63:3 83:3,14  
 119:14,18,22 129:1  
 136:4,7 145:20  
 150:22 163:15,18  
 165:16 173:14 179:11  
 181:1 212:18 377:4  
 382:17 449:11  
**comments** 6:2,6 12:6  
 33:20 37:11 46:4  
 47:15 52:12 55:15,17  
 66:14 78:3,6 79:16  
 82:22 92:13 94:10  
 115:19 119:3,10,19

120:5,6 134:3 142:12  
 143:1,2 148:9 178:18  
 186:2 203:19 207:5  
 209:21 212:13 213:18  
 222:16 223:13 228:17  
 231:19 233:7 235:12  
 255:6 367:10 384:13  
 401:7 450:5 468:19  
**commerce** 47:2,12  
 145:2  
**commercial** 89:2 115:8  
**commercially** 114:10  
**Commission** 9:7,20  
 11:14 39:7 64:5 106:7  
**Commissioner** 143:11  
 171:17 187:5  
**Commissions** 8:15  
**commit** 177:7  
**commitment** 50:1 74:7  
**commitments** 336:15  
**committed** 146:17  
 149:9 187:17  
**committee** 3:3,8,17  
 4:10,14 5:8,21 7:13  
 9:17 11:19 13:1 14:7  
 14:9,10 15:18 16:8,16  
 18:1,16,18,21 19:1,1  
 19:7,10,14,15 20:9  
 21:2,13,16 22:12,17  
 23:5 24:6 25:10,21  
 27:20,22 35:19 36:5  
 50:15 56:9 71:5 73:8  
 74:18 75:22 78:2 79:2  
 81:1 92:7 103:18  
 110:2,4 113:12  
 127:22 132:13 144:13  
 153:3 172:20 173:18  
 176:4 179:1 180:4  
 191:12 196:4,6 199:7  
 201:1 210:9 225:13  
 228:14 252:22 253:15  
 353:21 355:20 356:3  
 376:3 382:8 383:8  
 385:5 386:16 394:22  
 401:15 450:18 461:3  
 461:16 463:19 465:14  
 467:9 468:1,2,4  
 469:10,15 470:7  
 471:12 472:3,11  
 473:18  
**committees** 59:7  
 110:13 130:4 228:10  
 470:12 473:6,7  
**common** 202:17 203:14  
 207:21 238:1 354:13  
 371:17 403:19 417:8  
 418:1 419:7 431:20  
 435:3 436:16

**commonly** 125:18  
**communicate** 56:8  
 116:7 128:20 129:13  
 205:7  
**communicated** 53:1  
 176:18 288:12 332:9  
**communication** 208:3  
 213:9 333:1  
**communicative** 51:21  
**community** 11:10  
 155:22 158:22 312:1  
 441:13  
**compact** 136:18  
**companies** 87:7,11  
 96:7 153:19 154:1,2,5  
 178:7 193:2,12 243:4  
 252:3 256:17 265:16  
 301:3 315:4  
**company** 6:21 31:1  
 44:22 137:22 192:3  
 192:20 239:14,16  
 244:17 248:20 250:12  
 253:7 255:8 256:22  
 257:4,22 258:5  
 259:18 261:18 265:20  
 265:21,22 276:3  
 277:9,13 304:22  
 305:1,17,19 312:18  
 315:2,3 325:20 327:6  
 329:11,20 333:8,11  
 349:4,21,22 350:1,12  
 350:13 351:5,8  
 363:20,22 376:1  
 380:7,15,16 402:20  
 443:12  
**company's** 191:13  
 255:13 350:4  
**compare** 113:13 371:4  
 392:18  
**compares** 423:21  
**comparing** 375:13  
 385:8 396:3  
**comparison** 371:22  
 384:22 465:3  
**compartment** 260:19  
 307:20  
**compartmentalized**  
 34:20  
**compatibility** 358:19  
**compatible** 359:12  
 360:3  
**compelled** 58:4,12  
**compelling** 56:10 79:21  
 174:19  
**competency** 213:17  
 214:3 215:20 217:5  
 222:14  
**competent** 216:10

318:18  
**competing** 113:4  
**competition** 412:15  
**competitors** 380:22  
**compiled** 215:22  
**complete** 208:9 275:12  
 304:14,19 349:17  
 408:19 445:1  
**completed** 28:6 195:1  
 295:5  
**completely** 124:2  
 139:18 287:12 383:14  
 387:18 472:17  
**completeness** 370:1  
**completes** 291:10  
**completion** 220:21  
**complex** 222:7 285:12  
 405:21  
**complexity** 69:22  
 382:22  
**compliance** 8:10,13  
 58:8 59:20 66:12,20  
 66:21 67:12,20 93:14  
 151:19 339:20 340:8  
 358:8  
**compliance-based**  
 66:2  
**Compliant** 158:14  
**complicated** 231:18  
 272:16  
**complication** 95:21  
**complying** 181:9  
**component** 55:1 66:6  
 365:4 394:5 437:8  
**components** 109:5  
 352:19 353:2 355:4  
 362:15 372:1 377:21  
 381:14  
**composed** 130:9  
**comprehensive** 215:21  
 353:19 379:5 391:8  
 407:22  
**comprised** 88:21  
**compute** 411:17 429:6  
**computer** 347:16  
 374:13 425:22 446:15  
 460:18  
**computers** 411:19  
 412:11,11 413:2  
**computing** 411:11  
 413:9  
**concept** 62:21 93:21  
 117:21 216:8 318:1  
 331:3 343:17 432:22  
**conception** 165:19  
**concepts** 28:20 426:20  
 430:2  
**conceptual** 406:7

421:22  
**Conceptually** 62:5  
 407:10  
**concern** 42:5,17 43:18  
 61:11 85:3,12,18  
 129:10 159:10 162:3  
 163:10 164:21 169:11  
 187:7 239:9 269:8  
 274:20 282:16,17  
 316:15 317:2 323:18  
 471:3  
**concerned** 63:16 98:6  
 168:18 250:17 268:19  
 299:9 472:18  
**concerning** 241:7  
**concerns** 60:5 87:7  
 113:17 171:10 242:15  
 269:19  
**concert** 225:11  
**concise** 26:20  
**concluded** 70:9 104:3  
**concludes** 32:1 379:7  
**conclusion** 22:9 31:4  
 222:10  
**conclusions** 101:15  
 130:11  
**concurrence** 286:20  
**conditioner** 113:4  
**conditions** 360:6  
 361:21 364:20 366:17  
 374:6 375:17 383:10  
 384:11  
**conduct** 210:10 220:7  
**CONED** 206:21  
**conference** 23:17  
 467:13,20 469:11  
**conferences** 217:17  
**conferred** 102:4  
**confess** 307:15  
**confidence** 257:18  
 340:18 371:18 458:15  
**confident** 58:13 114:6  
**confidential** 37:2 114:9  
 114:9 115:7 117:5  
 149:5 177:3,8 186:13  
 216:5 244:20 252:16  
 271:17 279:17,18  
 288:8,21 305:10,16  
 319:7,9 336:17,18  
 338:5,18 348:6  
**confidentiality** 35:12  
 65:14 84:6 94:20  
 124:14 126:8 160:22  
 172:8 217:3 220:22  
 244:15 306:20 435:17  
**configured** 210:5  
**confirmation** 331:7,8  
**conflict** 95:19 155:7

199:5 439:10  
**conflicts** 196:17  
**conformance** 93:9  
**confused** 153:5 463:17  
**confusing** 436:15  
**confusion** 141:16  
 142:11 214:7 403:5  
**Congress** 47:11 90:18  
 90:19 98:9 104:9,12  
 105:1 114:19 115:3  
 120:8 121:12 133:10  
 145:2 146:11 147:13  
 148:6,18 153:4  
 163:20 168:5 176:20  
**Congress's** 120:9  
 148:1 149:17  
**congressional** 47:2  
 72:11,17 139:4  
**conjunction** 75:15  
 130:3 131:22  
**consensus** 159:9 270:3  
**consequences** 121:7  
 178:10 365:1  
**consider** 4:17 96:10,12  
 103:17 109:9 113:12  
 118:1 124:3 127:20  
 132:22 144:16,20  
 179:1 184:6 365:2  
 376:3 423:16  
**consideration** 19:15  
 110:2 127:7 163:20  
 206:10  
**considerations** 360:20  
 360:21 365:5  
**considered** 12:14 21:21  
 291:19 359:7  
**considering** 75:6 92:19  
 224:15  
**considers** 120:1  
**consistency** 103:18  
**consistent** 30:1 101:22  
 102:18 104:4,13  
 376:12,20 390:2  
**consistently** 357:15  
**consolidated** 174:5  
**constant** 90:14  
**constantly** 213:3  
 424:17  
**constitute** 61:9 170:17  
 171:4  
**constitutes** 170:11  
 183:21 184:7  
**construct** 184:18  
**consultant** 8:9  
**consume** 416:21  
**consumed** 416:20  
**consumer** 206:7,16  
 414:12

- consumer-driven** 413:15 414:10  
**consuming** 416:22  
**contact** 62:9 206:21 373:8  
**contained** 178:1  
**container** 425:17  
**content** 159:8 201:17 208:8  
**contents** 3:1 22:1 375:20  
**context** 18:9 56:13 74:22 188:21 194:5 199:14,18 206:7 227:6 377:15  
**continual** 236:5 357:20  
**continually** 227:22 424:17  
**continue** 18:1 24:10 25:6 42:9 139:11 143:6 207:9 208:7,18 226:5 358:3  
**continuous** 225:9 226:6,7 227:2,11 228:4 358:2 377:19 414:19  
**contract** 19:22 354:8 361:15  
**contractor** 435:9  
**contractors** 91:11 179:8  
**contractual** 90:4 91:9 128:3  
**contradictory** 141:15  
**contradicts** 189:20  
**contributing** 334:6 439:20  
**contribution** 28:8 158:21  
**contributions** 126:22  
**contributors** 403:11  
**control** 62:16 277:4 355:12 371:21 377:13 377:16 435:20  
**controller** 272:22 328:20  
**controllers** 329:1  
**conversation** 18:5 34:6 47:14 49:1 53:1 100:3 101:12 103:3 143:4 157:6,6 402:5 403:6 403:17 430:16  
**conversations** 13:4 23:19 232:8,9  
**convey** 131:8 143:9  
**cool** 308:4 335:6 343:2 415:19 455:17  
**cooperating** 356:7  
**cooperation** 90:22 91:20 92:2,10 356:12 356:16 469:6  
**coordinate** 78:7 80:21 277:5  
**coordinates** 363:19  
**coordinating** 75:20  
**coordination** 76:7 276:21  
**core** 92:11 464:10 466:17 467:1,5  
**cores** 429:12  
**corner** 15:9 195:16 272:18  
**corollaries** 451:19  
**corporation** 252:12 271:4 350:21  
**correct** 27:22 95:17 117:15 141:9 149:20 155:17 166:20,21 240:11 382:4 464:3  
**corrected** 149:5 177:4  
**correcting** 156:20,20 157:12 222:19 248:18  
**correction** 277:5  
**corrective** 245:20 268:8 270:5 275:10,12,13 275:14,18 278:19 296:9 304:15,19 306:13,22 307:5 308:3 324:12 333:12 344:20  
**correctly** 87:10 136:14 283:9 295:7 379:12  
**correlate** 454:21  
**correlated** 372:21  
**correlations** 423:17  
**correspondence** 218:19  
**corresponding** 19:8  
**corresponds** 232:20  
**corrosion** 156:19,22 157:18 158:7,17 352:16 355:12 359:11 367:9 372:21 389:20 389:20 391:1 393:14 393:16 400:22 456:8 456:9,21 457:2,3  
**COS** 191:22 202:21  
**cost** 37:4 106:18 221:8 442:16  
**cost-sharing** 221:21  
**Costco** 285:6  
**costs** 221:19 365:22 427:18 449:21  
**Cote** 1:19 8:8,9 24:13 25:12 27:1 31:17 32:20 33:8,16,19 34:12,17 35:4 38:4 39:14,18 40:16 41:7 41:15 43:12 44:1 45:22 47:13,22 50:4 52:10 53:10 54:5 55:5 55:14 56:17 57:19 58:3,17 61:3 62:14,20 63:21 65:22 69:18 70:7,15 71:2 73:6 81:13 82:8 83:11,13 83:13 85:13,19 96:19 97:19,21 117:1,1 136:4,4 141:11,11 142:6,10 150:22 153:8 154:12 155:15 157:17,17 159:15,18 159:22 169:16,16 174:10 193:11,11 333:2 336:1  
**Cote's** 405:6  
**coughing** 150:13  
**counsel** 2:11 20:13 229:16 351:21  
**counseling** 275:7  
**count** 314:18 388:18  
**counterpart** 339:1  
**country** 314:3 334:2  
**couple** 25:21 35:3 38:7 40:4 49:17 58:20,22 76:5 77:16 79:20 83:21 99:10 202:5 225:11 289:21 302:9 324:18 337:17 338:21 408:2 455:11  
**course** 22:8 75:1 104:1 188:16 219:7 221:19 250:19 253:9 265:21 268:20 273:21 283:16 285:20 287:18 307:21 403:1 410:21 420:2 430:21 434:21  
**courses** 221:18  
**court** 19:22 68:18 87:16 147:21 446:22 470:8 470:18 471:2,4,5 473:10,11,14,19,22 474:9  
**cover** 25:14 63:22 162:6 182:3 269:5  
**coverage** 181:16 312:17  
**covered** 14:12 59:1 172:7 183:19 269:17  
**covering** 63:14  
**covers** 71:14  
**CP** 389:21  
**CPU** 428:22 429:12  
**crack** 63:17 159:12  
**crack-like** 363:8  
**cracking** 135:8  
**cracks** 157:3 359:10,13  
**Credit** 1:19 110:7,7 224:13 226:9,12 402:10,13,14,19 407:15 420:19 426:19 434:9 444:19 450:3,6 450:12 453:14 457:18 459:21  
**craft** 127:5 130:3 160:2  
**crafting** 144:10  
**crap** 246:11 259:16  
**crash** 315:19 325:10  
**crashed** 289:22  
**CRC** 110:7  
**cream** 236:1  
**create** 35:5 36:17,18 46:15 47:4,8 61:12 77:5 89:9 95:21 109:13 117:12 141:16 142:10 151:1 159:19 178:6 205:15 220:4 238:19 382:13 392:13 433:2  
**created** 80:6 89:12 415:5  
**creates** 141:19 397:22  
**creating** 26:7 35:10 209:18 379:22  
**credibility** 39:12  
**credit** 44:16 82:8 315:21 440:20 443:4  
**credits** 162:13  
**crescendo** 463:9  
**crew** 235:16,21 249:6 272:15 273:13 275:5 276:13,13,14,18 278:11 295:6 298:2,7 299:3,8 300:5,13 319:21  
**criminal** 54:11  
**criminalization** 313:15  
**criteria** 209:5 216:6 221:12  
**critical** 24:21 25:2 26:4 26:9 30:22 31:17 35:9 38:5,15 39:5 47:18 52:4 57:8 66:5 79:12 84:16,22 96:15 138:19 203:10 246:19 248:8 251:1 279:1 290:14 291:20 293:12 418:2 449:17 472:7  
**critically** 97:13  
**criticisms** 148:10  
**Crochet** 1:20 7:2,2  
**Croix** 319:22

**cross-support** 228:13  
**crowd** 249:5  
**Crowley** 74:9  
**cruise** 236:22  
**Cruises** 254:4  
**crunch** 412:8  
**crux** 246:5 248:6  
**cryptic** 435:13  
**crystal** 17:18  
**cubicles** 332:18  
**cuff** 406:6  
**culled** 385:1 396:8  
**culture** 49:8 238:19  
 348:12  
**cumbersome** 92:15  
 290:18  
**current** 214:2  
**currently** 11:6 22:16  
 108:2 135:14,20  
 203:12 213:15 447:7  
**curriculum** 221:14,15  
**customer** 331:17 354:4  
 354:4,8,20,20 356:9  
 359:3 366:15,16  
 380:21 381:11 382:3  
**customers** 169:4  
**cut** 130:20  
**cutting** 345:21 393:11  
**cyber** 404:4 432:15  
 434:21 435:1,5,7,10  
 435:16 436:12 437:9  
 440:16  
**cycle** 108:2,3 374:11,16  
 375:2,4,5  
**cycles** 374:21  
**Cyndi** 188:15  
**Cynthia** 89:2,5

---

**D**


---

**D.C.** 16:22 237:8  
**Dad** 318:7  
**daily** 44:2  
**Dallas** 235:15 285:2  
 335:11  
**damage** 83:20 177:19  
 314:15,18 315:4  
**damaged** 68:17  
**Dan** 1:19 8:9 24:13  
 32:10 39:21 46:6  
 47:17 58:21 79:16,22  
 81:13 83:13 85:1 87:6  
 96:2,18 97:17 115:21  
 116:22 117:1 136:2,3  
 136:4 141:10,11  
 148:12 150:21 157:17  
 169:15,16 171:15  
 174:9 175:5 193:10  
 193:11 403:16 405:6

**Dan's** 405:4  
**Dane** 89:1,2 188:7  
**danger** 177:21  
**dangerous** 340:11  
**dash** 6:7  
**data's** 37:1 53:16,17  
 141:17  
**database** 111:14 174:5  
 390:21 391:8,21,22  
 392:13 410:6,8  
 416:10,12,13 418:16  
 418:17 425:2 427:9  
 428:16 430:7,19  
 431:21 446:18 454:11  
**databases** 406:10  
 417:6,14 418:20  
 419:3 425:7,8 427:5  
**datamatics** 383:17  
**datamining** 225:19  
**dataset's** 334:8  
**date** 68:18 99:7 357:4  
 446:11  
**dates** 16:13  
**daunting** 185:20  
**dawned** 348:5  
**day** 44:4 75:12 129:12  
 154:15 200:11,17  
 205:10 237:3,9,15  
 265:4,8 267:16  
 270:14 274:11 280:19  
 285:13 288:13 289:22  
 309:5 310:11 312:6  
 320:13 332:16 369:3  
 370:1 402:16 405:20  
 424:9 426:21 433:1  
**days** 26:9 58:22 107:22  
 181:19 234:21 235:2  
 241:8 258:11 267:22  
 280:18 289:21 308:2  
 318:14 469:7  
**daytime** 246:21 302:1,5  
**DB** 427:8  
**de-** 205:3 317:6 441:4  
 444:2  
**de-ice** 289:13  
**de-iced** 289:14,19  
 290:6  
**de-identification** 67:4  
 404:4 437:20 440:13  
 442:1  
**de-identification's**  
 437:21  
**de-identified** 66:18  
 114:13 115:13 130:2  
 135:6 140:10,13  
 202:8 220:8,13  
**de-identify** 221:1  
 252:21 255:19 443:20

**de-identifying** 117:22  
 275:3  
**dead** 52:9 451:7  
**deadline** 158:6  
**deadlock** 412:15  
**deadly** 177:16  
**deal** 32:7 105:17 125:13  
 190:20 264:14 279:3  
 303:21 310:5 315:9  
 321:6,7  
**dealing** 25:22 49:9  
 70:19 140:11 329:3  
 384:6,9 409:17  
**debate** 29:6 35:6 36:5  
**debating** 309:17  
**debrief** 267:15 275:5  
**debts** 325:2  
**December** 5:10 17:16  
 23:8 98:20 99:1  
**decentralize** 447:22  
**decentralized** 448:5  
**decide** 79:1,2,3 107:8  
 118:5 130:10 146:15  
 275:17 335:5 440:8  
 448:19  
**decided** 28:9 53:4,16  
 77:5 241:19 251:12  
**decides** 127:22 148:6  
 275:11 440:4  
**decipher** 420:5  
**decision** 53:21 253:13  
 270:4  
**decision's** 53:8  
**decisions** 109:22 362:6  
**deck** 309:3 441:18  
 452:2  
**decomposition** 455:15  
**decrease** 364:12  
**dedicated** 268:2  
**deduced** 465:22  
**deem** 443:18  
**deemed** 147:22  
**deep** 240:10 299:10  
 320:10 353:12 404:12  
 448:16  
**deep-oil** 242:18  
**deeper** 125:2 386:6  
**defect** 385:14  
**defects** 361:13 386:6,8  
 393:7 418:5  
**defense** 187:6 435:9  
**defer** 52:20 53:9 125:9  
**deferred** 113:16  
**deficiencies** 157:12,21  
**deficient** 156:22  
**define** 97:6 356:12  
 362:12 367:6 376:21  
 464:17

**defined** 169:22 170:12  
 184:4 216:2 364:19  
 366:10 370:10  
**defines** 183:16  
**defining** 183:17 209:5  
 221:11 363:11  
**definitely** 44:21 59:18  
 120:4 127:1 133:1  
 145:21 146:8,17  
 163:13 168:10 382:20  
 384:16 426:13  
**definition** 359:1  
**definitions** 221:22  
**degree** 320:16 321:18  
**degrees** 320:4,5,7,15  
**Deli** 195:16  
**deliberately** 420:15  
**deliberation** 19:16  
**delineation** 199:22  
**deliver** 99:4 174:1  
 418:5 455:20  
**deliverable** 5:1 219:1  
 373:14  
**deliverables** 109:21  
 215:15  
**delivers** 342:9  
**delivery** 204:16 380:10  
 418:1 439:16,17  
**Delta** 263:18,19,20  
 279:22 333:18  
**demand** 123:19 411:17  
**demonstrate** 153:12  
**demonstrated** 44:11  
 45:19  
**demonstrates** 44:18  
**demonstrating** 62:3  
**Deng** 1:20 7:22,22  
 382:17 383:6,12,16  
 387:11,14,17 388:4  
 388:21 390:8  
**denial** 436:10  
**density** 389:19  
**dents** 361:9  
**deny** 104:5  
**department** 1:1 106:22  
 255:17 282:21 285:21  
 288:22 319:17 326:2  
 358:7 471:22  
**department-wide** 473:4  
**dependent** 181:12  
 386:18  
**depending** 408:11  
**depends** 140:9  
**deployment** 202:2  
**depth** 385:13,17  
**deputy** 7:19  
**derail** 465:13  
**derivative** 407:16

- descend** 249:4,8,13  
**descent** 330:8  
**describe** 18:11 40:2  
 46:13 80:4 140:20  
 145:22 152:1 200:12  
 201:5 205:10 250:21  
 425:4  
**described** 21:11 44:13  
 45:14 77:14 85:6  
 153:9 328:14  
**describes** 406:22 420:8  
**describing** 409:13  
**description** 31:15  
 155:17 434:17  
**descriptions** 216:2  
**descriptive** 433:7  
**descriptor** 135:18  
**desert** 298:6  
**design** 184:5 377:16  
 410:16 415:12  
**designated** 1:13 2:6  
 4:12 9:16 19:18 27:12  
 73:18  
**designed** 136:8 221:15  
 359:14 363:4  
**designers** 221:16  
**desire** 48:19,20 165:6  
 472:5 473:8  
**desired** 220:11  
**desires** 99:5  
**desk** 5:13 6:12  
**detail** 29:22 63:22  
 70:17 74:11 75:17  
 118:14 363:13  
**detailed** 35:22 107:6  
 377:7  
**details** 59:5 87:14  
 105:10 353:13 360:11  
 377:3 400:15 406:1  
 416:18 425:6 455:18  
**detect** 157:3 359:11,13  
 359:14 362:14 368:18  
**detected** 396:7  
**detecting** 359:10  
**detection** 363:12  
 364:12,22 366:20  
 367:3  
**determine** 168:4 363:1  
 369:8 389:19 444:17  
 449:19  
**determined** 148:3  
 156:6,7 167:17  
**develop** 5:9 45:2,6,9  
 112:10 119:21 208:7  
 221:14 423:22  
**developed** 21:8 23:2  
 45:8 86:14 202:15  
 216:21 219:11,18  
 221:16 222:6 238:3  
 357:13  
**developing** 76:9 95:16  
 119:6,8 333:21 354:5  
 357:2 376:4 418:11  
 459:14,19  
**development** 4:18  
 35:17 109:1,3,10  
 185:13 194:16 208:19  
 219:11 222:21 450:1  
**deviate** 385:21  
**deviated** 261:22  
**deviation** 244:17 249:5  
 259:14 274:20,22  
**deviations** 248:16,22  
 249:3  
**devices** 5:17  
**devils** 59:5  
**diagnostics** 433:13  
**diagram** 80:6 326:14  
 373:11  
**dial** 243:7  
**dialog** 48:11  
**Diane** 1:16 9:19 20:13  
 64:4 103:19 106:6  
**dibbled** 231:6  
**dicing** 423:3  
**differ** 364:5  
**difference** 33:2 68:5,7  
 121:22 122:10 241:2  
 363:11 432:10 453:15  
**differences** 364:8  
**different** 13:13 34:20  
 44:14 53:11 56:13  
 60:3 62:15 67:21 69:6  
 95:10 101:10 125:13  
 125:13 127:9,13  
 130:21 131:14 141:13  
 150:13 157:7,16  
 171:14 186:13 188:12  
 191:7 193:8 205:2  
 209:2 219:4 226:2,18  
 228:10 234:16 237:8  
 250:3 280:6 283:12  
 312:22 314:11 320:20  
 330:19,19 331:3  
 332:14,15 336:9  
 338:3 340:11 343:22  
 344:1,21 354:15,15  
 356:22 358:16 363:5  
 363:18 370:10 374:20  
 383:14 395:4 407:8,9  
 407:18,20 408:3  
 409:14 410:3,10,11  
 410:14 411:13 413:2  
 417:5,6 418:20 422:4  
 423:2 427:5,9,10  
 432:13,14 437:11  
 439:1 440:15 444:8  
 447:5,6 448:4 449:20  
 461:21 464:14,16  
 465:8 466:8  
**differential** 456:15  
**differently** 155:16  
 408:11  
**difficult** 47:5 213:5  
 364:14 384:1 395:3  
 395:13,20 446:1  
 470:17 473:5  
**dig** 139:6 393:19  
 423:21  
**digest** 26:22 54:22  
 112:4  
**digs** 371:4 381:21  
 394:4  
**diluting** 95:13 159:11  
**DIMP** 171:3  
**dining** 13:8  
**direct** 19:11 74:21 75:1  
 90:19 114:20 121:12  
 133:11 273:1 369:19  
 459:12  
**directed** 115:6,10  
 129:21  
**direction** 76:20 118:6  
 181:11 270:6,15  
 276:7 328:21 369:2  
 448:10  
**directionality** 26:1  
**directions** 354:19  
**directive** 63:13 473:4  
**directives** 470:11  
**directly** 115:14 214:6  
 216:15 255:12 326:2  
 333:3 352:20  
**director** 7:3,6,10,19  
 8:22 10:7,11,21 11:4  
 11:12 29:21 43:21,22  
 44:2 49:2,5 50:3  
 117:10 128:2 402:19  
**directors** 45:5 420:11  
**directs** 148:19  
**dirty** 247:4  
**disadvantages** 53:2  
**disagree** 31:5,7 32:10  
 32:22 33:10,11 46:1  
**disagreeing** 457:13  
**disagreement** 39:14  
 40:16  
**disciplinary** 239:14,21  
 240:2  
**discipline** 276:4 305:1  
 305:2,4  
**disciplined** 191:2  
**disclose** 67:17 115:1  
 166:11 350:3  
**disclosed** 121:16  
 148:16 149:4 177:3  
**disclosing** 128:10  
**disclosure** 114:3,8  
 119:3 122:3 147:15  
 178:4 184:22 420:11  
**disconnect** 95:9  
**discourage** 90:16  
**discover** 67:21 439:6  
**discovered** 149:3 155:6  
 278:20 280:12  
**discovery** 147:16  
 149:11 178:5  
**discrepancy** 371:22  
**discretion** 146:20  
 187:10,11  
**discretionary** 187:16  
 187:22  
**discrimination** 168:19  
**discs** 370:6  
**discuss** 30:6 46:15  
 188:14 207:9 227:1  
 267:8  
**discussed** 53:19 93:16  
 206:2 322:21  
**discusses** 227:21  
**discussing** 190:16  
 262:16 401:13  
**discussion** 3:15,17  
 13:17 14:10 28:3,11  
 29:10 36:15 41:11  
 52:13 54:19 55:4,8  
 63:12 78:17 79:19  
 88:2 101:8 105:2  
 110:10,11 113:19  
 133:10 134:9 141:15  
 145:16 162:10,13  
 163:14 164:5 165:10  
 169:10,19,21 171:21  
 173:17 196:2,4 200:5  
 201:11 206:3,5,19  
 208:2 210:2 214:9,20  
 215:1,4 227:8 228:19  
 238:9 335:21 360:21  
 453:4 461:20 467:1,6  
 467:20 472:13,18  
**discussions** 13:2,13  
 14:3 46:8 69:19 77:3  
 82:20 102:14 159:22  
 188:4 460:22 461:8  
 467:9  
**dismiss** 150:20  
**dispatch** 263:10 281:5  
 283:13  
**dispatchers** 328:16  
**display** 236:7  
**disregard** 302:16  
 303:20 304:2,4

**disruption** 230:4  
**disseminated** 312:2  
**dissimilar** 432:2  
**dissuades** 214:7  
**distance** 363:15 369:2  
 369:7 370:4  
**distill** 175:19  
**distinct** 218:6,13  
**distinction** 154:12  
 155:4 161:19 173:19  
 174:6 191:5 213:7  
**distracted** 293:9  
**distributing** 123:17  
**distribution** 8:14 31:1  
 63:14 69:1,3,4,21  
 70:3,10 84:20 91:7  
 97:6 156:18 168:13  
 169:5  
**distrust** 36:7,12  
**ditch** 201:14 371:5  
 385:2,10,19 386:19  
 389:10 390:1  
**dive** 240:10 299:10  
 320:11 353:12  
**division** 11:3 333:5  
**DMV** 126:10  
**dock** 347:15  
**docket** 6:6 12:1,2  
**docs** 388:18  
**doctor** 181:7 408:16  
**doctor's** 432:9  
**document** 26:8 78:20  
 81:22 94:19 205:22  
 227:18,20 356:18  
 357:5 377:12  
**documentation** 5:7  
 20:4 226:22 336:13  
**documented** 208:15,17  
 215:19 336:22 366:12  
**documenting** 221:12  
**documents** 15:18 16:4  
 204:17,22,22 209:15  
 283:8 406:15 469:12  
**dog** 307:20,21  
**doing** 18:2,9 24:16 25:1  
 32:2,21 36:21 38:1  
 44:16 56:10 65:1 68:2  
 69:10,11 75:19 76:8  
 80:12 98:7 107:10  
 128:14,16 129:13  
 149:21 150:5 154:15  
 155:8 162:6 166:18  
 174:6 175:18 177:8  
 211:7 212:3 215:12  
 224:10,11 235:19  
 249:14 251:6 257:11  
 273:8 285:13 291:14  
 297:13,15 304:8

324:20 337:2 340:18  
 343:20 346:1 347:19  
 376:15 388:20 390:1  
 395:1 397:8 398:8  
 408:17 413:20 420:15  
 421:2 424:20,21  
 426:18 428:21 444:6  
 451:15,15  
**dollars** 261:19 459:9  
**domain** 42:13  
**Dominik** 89:2 188:15  
**door** 5:12 63:17 86:10  
 159:12 185:9 246:15  
 247:9,9,11,11 283:9  
 284:6 332:21  
**doors** 6:11  
**DOT** 16:21 18:3 105:13  
 112:12 314:12,13  
 315:1 324:2 343:14  
 351:11  
**double** 387:14  
**doubt** 141:19  
**Doug** 7:5 213:20  
**DOUGLAS** 2:14  
**dovetailing** 28:13  
**download** 320:3  
**downs** 65:9  
**downstream** 370:16  
**downtime** 365:21  
**Dr** 1:13 4:3 7:5,22 8:3  
 9:14 12:17,18 25:11  
 26:11 66:15 67:10,15  
 72:2 82:8 85:20 91:18  
 92:3 98:20 99:1 103:2  
 103:3 105:4 106:1,21  
 108:18,20 127:3,4  
 128:12 130:7 142:22  
 163:17 184:15 192:13  
 192:18 194:7,10  
 230:15 232:1 276:20  
 277:3,11,17,19  
 291:19 292:1,6,9,16  
 293:20 294:3,11  
 382:17 383:6,12,16  
 387:11,14,17 388:4  
 388:21 390:8,11,21  
 391:14 392:5 393:1,4  
 394:8 402:4 449:11  
 468:1,6,19,22 469:17  
 470:5 471:14 473:3  
**draft** 21:3 24:3 61:21  
 99:11 132:17 180:16  
 201:12 208:9  
**drafted** 21:19 201:15  
**drafter** 144:3 147:4  
**drafting** 20:4  
**drag** 343:18  
**dramatically** 170:7

**draw** 74:22 81:3 388:10  
 451:18  
**drawing** 75:18  
**drawings** 372:4,6  
**dream** 235:11  
**dreaming** 17:19  
**Dreamliner** 235:10  
**Drew** 2:9 12:19 14:1  
 74:3,8,17 201:21,21  
 355:10,11 367:21  
 379:11 384:15 394:10  
 399:6 408:12 417:19  
 429:3 452:4 454:10  
 463:12  
**Drew's** 407:3,4  
**drift** 463:17  
**drifting** 17:6  
**drill** 65:8 180:11  
**drill-downs** 131:8  
**drilled** 167:10  
**drive** 40:7 53:22 99:7  
 104:20 289:4 406:19  
 407:2 410:20 415:15  
 450:1 464:2,3  
**driven** 314:13 456:21  
**driver** 358:3  
**driving** 70:11 182:7  
 246:8,11,13,22 247:3  
 415:18 465:12  
**drop** 61:15  
**drug** 179:12,17 180:2  
 180:11 181:1 187:18  
 303:3,13 309:13  
 314:5,8,16 315:1,5  
 318:20  
**drugs** 177:22 179:14  
 302:20 303:11  
**druthers** 43:9  
**dry** 352:17  
**dude** 320:21 347:18  
 460:11  
**due** 121:6 133:6 470:10  
**dumb** 330:11 340:11  
**dump** 333:14 425:16,20  
 457:16  
**duplicate** 122:14  
**duplicating** 209:17  
**dust** 384:20 423:5  
**duty** 297:13,15  
**dying** 182:16  
**dynamic** 367:10 410:4  
 415:8  
**Dynamo** 427:8

---

**E**

---

**earlier** 51:10 56:18  
 75:12 103:6 111:2  
 176:2 184:16 208:3

208:21 217:20 230:14  
 255:6 266:13 275:22  
 294:10 304:16 341:4  
 349:5,15 355:17  
 398:3 403:17 428:14  
 440:2,2 445:2 449:14  
 449:16 454:9 464:3  
 469:3  
**early** 47:20 70:9 228:7  
 228:8 229:9,10  
 231:21 232:3 238:21  
 241:4  
**earth** 420:4  
**easier** 63:4 123:22  
 384:10  
**easily** 31:20  
**easy** 195:16 199:22  
 213:4 323:9 380:6  
 382:11 388:20  
**eat** 224:8 230:6,13  
 231:15 236:1  
**ECA** 227:3  
**echo** 48:6 49:4 141:12  
**ECL** 291:14  
**Ed.D** 2:14  
**Edge** 102:10  
**EDS** 171:18  
**educate** 226:7 403:18  
**education** 50:16 216:3  
 226:1 411:5  
**educational** 217:10  
**effective** 31:10,14  
 37:18,19 79:15 201:6  
 204:9 288:4 372:10  
 393:10 413:11  
**effectively** 57:5 200:18  
 418:8  
**effectiveness** 210:4  
 388:16  
**effort** 44:3 51:2,12  
 55:22 209:18 217:21  
 365:1,15  
**efforts** 17:22 19:21  
 23:22 51:14 78:7  
 191:16 204:14 225:19  
**EGBWS** 330:9  
**eGov** 12:1  
**eight** 89:17 195:1  
**eight-hour** 267:7  
**eighth** 460:13  
**either** 61:14 64:1 142:2  
 152:3,4 171:4 193:16  
 266:18 364:11 386:7  
 386:8 397:6 412:10  
 414:18,19 451:6  
**elaborate** 185:5 342:16  
**elastic** 411:21  
**electric** 236:17,18,19

291:3  
**electrical** 291:9  
**electronic** 236:13,13  
 295:11  
**electrical** 291:15  
**electronically** 295:5  
**electronics** 396:18  
**elegant** 190:18  
**element** 166:1 176:16  
 214:6  
**elements** 56:16 75:5  
 79:13 201:22 205:11  
 217:15  
**elephant** 409:13 458:4  
**elevation** 298:12  
**eligible** 178:2  
**eliminate** 41:5 124:5  
**else's** 217:20  
**Elvis** 272:14 273:18,21  
**email** 268:9 332:21  
 380:9  
**embody** 115:14  
**embrace** 62:21  
**emerged** 96:4  
**emergency** 6:7  
**emphasis** 32:11,13  
 75:4 82:5 96:11 356:6  
**emphasize** 119:21  
**employee** 49:3 137:22  
 180:1 189:14 190:5  
 192:19 193:6 240:4  
 242:4 243:9,22  
 253:10 256:5,22  
 258:9,20 259:8 262:6  
 271:12 274:22 275:7  
 275:11,12 287:17  
 294:6 304:14 305:2,4  
 308:1 316:15 317:1  
 327:15 346:13,14  
 349:19 351:7  
**employee's** 177:18  
 179:5  
**employees** 177:20  
 179:3,8 180:15,20  
 182:3 188:11 191:7  
 216:22 223:7,7 238:4  
 238:19 240:22 242:8  
 243:20 244:13,13  
 248:11 262:1 265:18  
 269:4 278:7,18,21  
 287:9 288:14,19  
 307:19 316:9 317:10  
 318:4,18 326:8  
 338:19 344:7 345:13  
 345:19 348:14  
**employer** 277:10  
**employers** 189:11,20  
**enable** 48:22 95:2

219:11 356:11  
**enabler** 43:4,5  
**enabling** 357:13  
**enact** 98:9 114:19  
 121:12 133:11 147:13  
 163:21 176:20  
**enacting** 100:5 129:4  
**encapsulate** 58:21  
 438:20  
**encapsulates** 445:4  
**encompass** 170:8  
 204:11  
**encounters** 140:4  
**encourage** 4:19 17:22  
 60:1 115:3,16 146:12  
 148:7,20 149:18  
 152:4 171:8 180:5  
 198:18 200:4 217:12  
 228:5 238:4 346:22  
 399:7  
**encouraged** 60:9  
**encourages** 68:11  
 149:14 278:20  
**encouraging** 53:12  
 91:2 151:21 162:19  
**encrypt** 426:12  
**encrypted** 419:8,13  
**encryption** 420:3  
 436:17 442:8,9,20  
**ended** 102:3 230:5  
 406:3,5 433:19  
**ends** 145:10 432:18  
**energetic** 227:7  
**energy** 10:17 11:3 39:9  
 44:8,10 45:16 55:20  
 191:10 194:5 198:10  
 323:9  
**enforceable** 68:2  
**enforced** 145:11  
**enforcement** 35:15  
 37:1 45:10 49:10 51:2  
 51:6 54:12 59:10,20  
 60:1,6,14,19 61:3  
 64:9,10 68:4,4 69:11  
 114:15 123:15 133:4  
 133:7,14 138:3,8,12  
 138:13,19 139:11,12  
 141:7 143:6,13,15,18  
 143:21 146:6,19  
 148:15 149:1 150:1  
 151:16 152:19 155:13  
 156:2,8 161:9 163:6,8  
 172:5,8 176:9 177:2  
 177:11 178:10 179:1  
 180:9 187:10,11,16  
 187:22 188:1 349:19  
 349:20  
**engage** 39:16

**engaged** 49:20 87:3  
 88:4  
**engagement** 86:3,22  
**engaging** 25:4  
**engine** 309:7,9,14  
**engineer** 241:14,20  
 352:16 367:9 401:1  
**engineered** 465:22  
**engineers** 241:16  
**England** 181:8  
**English** 26:21  
**enhance** 250:6 394:6  
**Enhanced** 372:8  
**enhancements** 296:11  
 324:13  
**enjoyed** 394:11  
**enjoying** 367:18  
**enlightening** 212:1  
**enormously** 170:19  
**enrich** 206:14  
**ensure** 41:10 216:22  
 300:18 356:13 367:1  
 368:14 398:15  
**ensuring** 72:22  
**enter** 90:3 91:9 92:22  
 185:1  
**entering** 144:14  
**entertaining** 48:10  
 272:7  
**enthusiasm** 210:18  
**entice** 113:19  
**entire** 27:15 101:13  
 158:11 236:4 271:22  
 311:10 342:4 436:12  
**entirely** 141:18  
**entities** 91:12 200:16  
 254:18 277:6 334:14  
 414:3  
**entitled** 213:17  
**entity** 93:3  
**entrance** 6:10  
**entry** 220:21  
**environment** 35:11  
 44:12 46:16 52:5  
 237:12,14 264:15  
 410:15 413:18 414:7  
 414:10 416:16 421:19  
 429:17 433:6 435:12  
**Environmental** 187:6  
**envision** 92:21 118:10  
**envisioned** 28:15 44:1  
 118:20 136:8 174:11  
**equipment** 222:8,21,22  
 223:9,9,10 331:10  
 357:8,16 374:9  
 377:18  
**ERC** 252:22 253:15  
 254:2,9 255:12,13

256:3,8 261:9 267:6  
 268:6 270:10,13  
 275:4,11,13 276:1  
 277:9 304:6 306:19  
 307:22 309:15 331:22  
 332:8 333:11  
**ERCs** 253:22 262:3  
**Eric** 1:17 10:15 44:7,8  
 55:19,20 75:20,21  
 81:13 191:9,10  
 193:21,22 198:9  
 210:1 400:11 403:6,7  
**Eric's** 407:17  
**error** 96:13 245:4,6  
 248:19 274:12 387:8  
 388:1 398:15  
**errors** 367:2,6  
**esoteric** 452:8  
**especially** 93:22 203:10  
 239:18 245:16 334:19  
 372:9 415:16 444:18  
 467:1 472:13  
**ESQ** 2:11  
**essence** 22:3 44:5  
 201:18 415:22  
**essential** 46:11 54:14  
 75:5 78:20 79:12  
 133:20 137:12 172:13  
 185:6,8  
**essentially** 37:4 38:16  
 38:20 54:11 170:4  
 193:18 208:5 220:4  
 351:1 358:17  
**establish** 6:22 25:9  
 64:21 90:1,4,21 91:12  
 136:19 161:11 362:1  
 376:12 459:18  
**established** 11:16 23:9  
 38:2 64:20 216:11  
 361:3 431:7  
**establishing** 104:14  
 354:13  
**et** 220:3 283:13 349:7  
 357:16 369:22  
**ethical** 474:4  
**ETL** 419:4,10  
**Europe** 294:19  
**evacuate** 6:8  
**evaluate** 369:20 373:22  
**evaluated** 363:1  
**evaluating** 354:16  
 386:3 389:9,11,12  
 423:9  
**evaluation** 370:19  
 371:20 375:19  
**event** 211:20 252:22  
 253:15 254:11 274:14  
 305:2 321:3 331:6

390:22 391:1  
**event's** 286:17  
**events** 178:2 192:1  
 209:3 280:11  
**eventually** 415:11  
 427:1 432:18 433:17  
 434:5,10 442:13  
 444:13 453:22  
**everybody** 144:9  
 176:14 180:19 182:8  
 194:13 230:5 237:15  
 237:20 241:16 251:19  
 253:19 259:17 278:13  
 279:10,19 281:16  
 283:16 290:8 294:21  
 302:10 315:10 317:4  
 321:14 332:13 348:8  
 352:12 380:15 382:14  
 400:6 435:18,21  
 458:8 461:3,10 469:1  
 469:5  
**everybody's** 304:8  
 347:14,21 457:8  
**everyone's** 17:22 35:19  
 58:9 464:20  
**everything's** 236:17  
 258:22 279:17 308:22  
**evidence** 80:16 128:18  
 147:16 149:12 178:5  
**evident** 450:22  
**evolution** 200:13 222:3  
**evolve** 42:9 374:9,10  
**evolving** 332:12 460:7  
**exact** 99:2  
**exactly** 60:20 86:9  
 96:19 127:19 137:15  
 138:9 145:13 168:9  
 193:12 253:4 337:19  
 381:12 385:16 387:11  
 466:1 468:15  
**example** 39:6,10 52:12  
 63:3 66:4,7 77:11  
 103:13 151:4 156:17  
 202:7 208:22 243:8  
 246:7 260:1 266:18  
 314:5,6 319:19  
 321:18 335:4 339:12  
 347:4 359:20 364:13  
 366:14 370:14 371:13  
 380:13 387:7 427:19  
 429:21 431:1,12  
 441:22  
**examples** 80:20 127:14  
 241:1 262:11 272:6  
 319:8 353:13 364:4  
 417:22 418:9 429:22  
 457:4,7,8 469:20  
 470:4

**excavate** 364:1,6,10  
**excavation** 389:15  
 392:3  
**excavations** 366:19  
**excellent** 27:14 46:1  
 147:4  
**excellently** 27:11  
**exception** 98:3 174:21  
 274:15  
**exceptions** 177:13,14  
**exchange** 42:3 418:11  
 420:13  
**exchanged** 417:8  
**excited** 322:17 352:13  
 402:15  
**excitement** 367:20  
**exciting** 322:12 352:17  
 367:8  
**exclude** 121:9  
**excluded** 54:10 123:21  
 303:10 305:12,14,18  
 306:5  
**excludes** 69:20  
**exclusions** 306:3  
**exclusive** 129:10  
**execute** 56:22 418:16  
**executed** 57:6  
**executing** 449:8  
**execution** 366:1,1  
**executive** 22:2 29:21  
 29:21 43:20,22 44:2  
 75:22 117:10 128:1  
 130:8  
**exempt** 69:9 122:18  
 188:20  
**exemption** 123:18  
 134:13 182:3  
**exemption-free** 122:18  
**exemptions** 134:12  
 182:19  
**exemptions/exceptio...**  
 188:12  
**exercise** 31:3 38:17  
**exist** 170:2 185:9  
 218:21 236:17 344:19  
**existing** 93:18,21 95:13  
 108:12 170:21 199:10  
 204:22 209:15 357:1  
 371:14 451:13  
**exists** 170:3 191:19  
 219:3  
**exit** 5:12 109:19 282:10  
 283:8  
**exits** 6:9  
**expand** 31:9 40:10  
 97:15 379:4 382:12  
**expanded** 157:9 170:6  
**expect** 362:5 388:12

393:13  
**expectation** 103:14  
 146:4  
**expectations** 64:1  
 77:18 143:8 211:3,10  
**expected** 393:2 456:12  
**expecting** 340:19 341:2  
**expensive** 429:11  
 445:3,22  
**experience** 13:20,21  
 50:10 56:10 94:16  
 183:17 184:18 191:12  
 191:13 206:22 216:4  
 225:18 230:18 231:4  
 242:1 259:13 330:1  
 396:19 398:9  
**experienced** 270:17  
**experiences** 400:4  
**expert's** 383:1  
**expertise** 93:6 347:2  
 396:12  
**experts** 22:20 343:9  
**expiring** 108:9  
**explain** 184:2 342:17  
**explaining** 126:6  
 143:17  
**explanation** 106:10  
**exploration** 422:12  
**explore** 30:4 222:1  
 460:21  
**exploring** 421:1 423:1  
 424:7 461:1  
**expose** 438:17  
**exposed** 86:13  
**expressing** 115:2  
**expression** 158:20  
 352:15  
**extend** 162:5,12 180:10  
**Extended** 417:10  
**extending** 179:2,6  
**extends** 180:19  
**extensive** 178:21  
**extent** 25:3 41:5 49:1  
 62:20 66:8 71:9,11,16  
 93:6 99:15 100:1,13  
 118:15 131:15,18  
 137:2 138:10 139:14  
 142:6 143:5 160:16  
 166:22 167:5 186:14  
 205:20 219:3  
**extenuating** 306:5  
**external** 89:1 188:8  
 363:8 372:20 457:2  
**externally** 109:7 126:14  
**extract** 173:8 419:4  
**extracting** 167:2  
**extraordinarily** 219:13  
 463:14

**extreme** 61:19 138:21  
**extremely** 176:7 182:20  
 192:11 469:7  
**Exxon** 254:3  
**Exxons** 343:1  
**eyes** 222:19

---

**F**


---

**FAA** 23:20 24:2 50:10  
 64:7 65:12 67:16  
 73:21 74:5 75:10 79:4  
 82:10 88:3 89:5,8  
 105:7 107:14 108:8  
 116:1,19 121:18  
 138:5 141:22 146:7  
 163:1 177:16 185:17  
 187:14 188:9,13,15  
 199:21 216:15 220:11  
 223:5 238:3,11 240:1  
 242:12 245:18,22  
 254:13,15 257:21  
 276:2 279:11 281:1  
 286:10,12 287:3,4,6,7  
 302:13 305:3,19  
 310:15 313:4 325:16  
 328:18 329:12,13,19  
 335:15 336:12 338:3  
 338:4 339:17,22  
 340:5,10,19 341:2,6  
 341:17 342:1,17  
 343:5,7,12,15 349:4  
 349:15 350:4,16  
 439:5  
**FAA's** 56:10 180:18  
 343:20 349:13  
**FACA** 59:6  
**FACAs** 471:21 472:4  
**face** 76:11,11 178:9  
 179:9 383:2 420:4  
**face-to-face** 23:11,13  
 23:18  
**facets** 409:11 435:15  
**facilitate** 213:9 224:21  
 467:9 471:5  
**facilitated** 99:13  
**facilitating** 99:20  
**facilitation** 473:11  
**facilities** 13:8 97:2  
 177:19 222:21,22  
**facility** 11:12 13:7  
 16:22 97:9 158:7  
 235:22 308:14  
**fact** 66:18 98:17 118:9  
 139:18 145:1 158:10  
 180:13 242:3 248:2  
 267:1 343:8 363:1  
 450:8 456:7  
**factor** 39:5,8



- factors** 58:7  
**faded** 248:3  
**fail** 275:15  
**failure** 41:3 177:18  
433:11  
**failure/full** 358:8  
**failures** 51:15  
**fair** 33:17 46:2 55:5  
73:7 250:20 263:8  
332:5  
**fairly** 266:7,12 292:13  
331:21 388:2 405:20  
414:6  
**faith** 149:20  
**fall** 56:2 135:13 167:17  
170:14 337:19 388:14  
388:18 419:5  
**falls** 175:1 338:2  
**Falsification** 303:4  
**falsified** 178:1  
**familiar** 404:8 443:2  
**fan** 251:10  
**fantastic** 198:14  
**far** 15:9 66:1 93:15  
94:13 100:22 131:6  
139:7 172:19 182:19  
198:14 215:18 227:1  
262:15 274:20 281:13  
320:7 328:10 339:16  
363:7 379:5 396:3  
424:10 456:11  
**fascinates** 169:20  
**fascinating** 426:9  
**fashion** 141:1 417:17  
417:18 423:2 470:1  
471:6  
**fast** 241:5 246:21 264:9  
302:11 364:17 368:13  
425:8  
**fast-paced** 264:15  
**fastest** 297:18  
**fatalities** 83:20 315:15  
315:20  
**fatality** 107:4  
**fault** 193:18 262:3  
**favor** 59:13 215:5  
**favorably** 111:13  
**favorite** 307:17  
**FDM** 294:16  
**fear** 52:2 90:11 114:16  
121:6 131:13 133:6  
147:11 176:7,8,18  
**fears** 59:18  
**feasible** 449:19  
**feather** 356:20  
**feature** 139:20 178:11  
299:19 368:20  
**features** 218:15,21  
299:5 362:16 433:22  
**February** 16:1 23:10,12  
28:6  
**federal** 1:12,13 2:6 4:9  
4:12,14 9:16 16:4  
19:18 27:13 35:16  
36:9 42:1 43:5,16  
46:20 49:2 71:14,19  
73:18 93:1,9 94:16  
107:3 108:1 109:6  
114:22 133:13 144:11  
144:19 145:1 146:2,2  
147:17,19 149:2,12  
176:10 182:1 184:9  
190:2 219:9 339:19  
411:14  
**federal's** 138:13  
**federally** 70:8  
**FedEx** 273:8,10 335:9  
**Feds** 70:22  
**feed** 203:16 288:14  
333:9 334:14 342:3  
**feedback** 37:11 48:11  
206:12,18 293:13  
366:19 466:22  
**feel** 25:19 28:2 57:16  
58:4 98:1 126:16  
155:7,9 157:5 164:3  
190:22 202:9 232:13  
247:12,15 278:7  
327:16 387:17 388:1  
429:2 434:11  
**feels** 68:16 163:21  
178:13 189:15  
**feet** 236:22,22 248:18  
298:13 309:7 330:9  
**felt** 58:12 125:20  
134:17 135:8 353:8  
**fend** 124:1  
**fewer** 104:6  
**field** 134:18 223:10  
335:11 364:15 370:19  
371:2 407:9 418:7  
422:3 452:7,19  
**fields** 384:9  
**fifty** 297:1,3 458:12  
**figure** 69:4 72:9,20 84:3  
121:21 122:22 183:4  
196:22 197:16 211:6  
242:8 333:22 348:1,4  
474:2  
**figured** 234:7 332:16  
**file** 252:10 269:10,10  
270:6 271:14 274:9  
274:13,13,18 275:1  
276:4,11 277:3 289:2  
289:11,19 290:3,13  
305:6,11 316:16  
323:18 326:19 340:14  
341:10,12,21,22  
342:1 347:14 420:8  
425:21  
**filed** 276:1 281:19  
285:21 290:6 299:7  
346:13  
**files** 285:19,19 425:16  
**filing** 290:10  
**fill** 246:18,20 443:4  
**filled** 247:9  
**filtering** 461:7  
**filth** 263:10  
**final** 26:8 31:19 49:3  
55:15,16 71:7 77:15  
221:9,10 330:9  
336:11 338:12 379:16  
**finality** 28:7  
**finalization** 17:17  
**finalize** 5:9  
**finally** 35:15 332:15  
369:10,14 370:6  
377:1  
**finance** 7:20  
**financial** 168:21  
**find** 5:14 16:19 36:19  
40:8 41:10 66:8 67:5  
76:19 85:8 105:10,19  
107:15 138:14 139:8  
154:6,15 157:15,21  
159:4,19 160:19  
172:17 183:9 185:10  
244:8 251:8 254:21  
262:4,8 264:16  
267:14 272:7 278:3  
282:9,12,15 287:14  
310:2 316:11 318:8  
323:18 327:18 335:16  
354:14 362:5 377:10  
423:17 424:6 426:9  
455:13 457:9 458:7  
473:7  
**finding** 31:11 87:11  
146:17 170:17 209:14  
218:20 226:6 397:5  
399:11  
**findings** 30:15 36:1,2  
38:9 86:12 171:4  
174:18 193:20 399:14  
**finds** 260:3 312:1  
**fine** 27:8 62:5 96:3  
194:19 195:17 270:12  
302:3 309:1 338:4  
**fined** 50:19  
**fingertips** 204:6  
**fire** 241:22 312:11  
348:15 389:17  
**fired** 239:2 241:10,16  
305:12 346:13,15  
**first** 23:11 24:22 52:15  
81:15 82:5 87:22  
89:19 91:19 93:15  
100:3,11 117:7  
169:18 175:13 180:14  
216:1 233:20 245:15  
246:13 261:5 273:3  
273:11 280:13,19  
281:18 284:5 288:11  
300:6 310:11 329:18  
344:13 348:20 352:12  
375:9 431:15 435:17  
441:6 450:8 463:19  
**fit** 65:19 80:1,2 91:22  
92:8 160:6 316:5  
415:10 418:22  
**fit-for-purpose** 416:15  
**fitness** 389:12  
**fits** 79:3 94:11 316:6  
**five** 6:4 38:14 98:12  
104:18 152:10 153:12  
154:4 177:16 205:9  
207:12 242:18 263:9  
280:10 283:20 296:18  
302:18,19 306:2  
409:12 416:7 441:5  
**fix** 58:11 248:13 304:8  
344:3 350:8,17,19  
392:20,20,21  
**fixed** 222:8 283:10  
288:18 308:15 347:22  
350:18 392:22 414:18  
422:21  
**fixes** 416:14  
**fixing** 155:1 315:22  
**flag** 100:2 102:20  
229:12 393:6  
**flap** 294:2  
**flat** 260:4  
**flavor** 29:16  
**fleet** 286:20  
**flesh** 22:18 95:7 100:14  
106:15 125:4 132:2  
186:21 227:4 467:4  
467:20  
**flesh-out** 226:8  
**fleshed** 65:8 99:12,22  
162:21 209:19 468:16  
**fleshing** 27:4 401:19  
466:16  
**flew** 234:14 299:15  
330:8  
**flexibility** 108:11  
115:17 167:12 416:16  
**flexible** 414:10 422:11  
**flies** 234:18,19  
**flight** 196:12,19 233:3

233:12 235:4,6,16  
 236:5 249:8,10,11,12  
 274:11 276:10 280:21  
 281:10 282:6,9  
 283:13 289:15 290:11  
 293:9,12 294:15,16  
 328:15 329:3,14  
 331:14 339:4 341:6  
 349:6 463:2  
**flights** 234:20 315:17  
 462:22 464:19  
**flip** 291:9  
**float** 20:14  
**floor** 6:2 214:18  
**flow** 38:5 131:22 170:1  
 196:13 333:3,7  
 360:13 368:13 370:8  
 373:11 445:20  
**flows** 31:21  
**fluff** 466:8  
**fluid** 181:10,19  
**flush** 449:17  
**fly** 235:15,17,18 237:1  
 252:11 260:1 289:13  
 297:4 298:9,18  
 299:16 302:2 308:18  
 313:21 315:16 340:20  
**flying** 235:8 236:5  
 237:10,15 250:8  
 251:19 252:13,14,15  
 272:21 274:16 286:7  
 286:10 287:19,22  
 296:19 298:3,3,14,15  
 322:17 340:22  
**FMA** 456:1  
**focus** 13:1 24:22 64:8  
 82:4 85:7,11 100:9  
 110:15 160:12 168:8  
 199:17,17 205:10  
 209:11 411:3 429:5  
 455:15 466:15 469:20  
**focused** 22:7 109:3  
 120:8,20 131:5  
 137:17 158:17 207:11  
 213:5 227:11 454:7,8  
**focuses** 429:17  
**FOIA** 121:7,10 122:11  
 122:19 123:3,8,18,21  
 124:1,12,16 125:10  
 125:14,16,17,21,22  
 129:3 133:3 149:11  
 178:4  
**folder** 425:21  
**folks** 12:4 60:9 65:17  
 112:10 146:8 163:8  
 197:19,20 229:9  
 237:13,17 253:21  
 254:3,7 259:2 282:2

284:17 300:15 303:14  
 342:22 343:14 344:18  
**follow** 6:14 60:19 87:6  
 106:1 261:11,12  
 262:4 269:6 316:9  
 326:22 335:20 350:1  
 387:12 473:20 474:3  
**follow-up** 325:12  
**followed** 75:14 283:9  
**following** 26:3 224:19  
 262:5 304:4 409:21  
 463:21  
**follows** 259:15  
**food** 108:20,21 109:8  
 227:9 230:10  
**foolish** 465:20  
**footage** 363:16  
**footnote** 116:15  
**footprint** 413:8  
**FOQA** 293:17 294:6,13  
 294:14 337:12  
**Force** 234:14,15  
**forces** 465:9  
**foremost** 93:15 216:1  
**forever** 99:9 243:19  
**forget** 64:6 243:21  
 251:10  
**forgetting** 468:20  
**forgot** 212:18 296:5  
**form** 171:14 220:4,5,6  
 246:19,19 255:7  
 432:11  
**formal** 29:20 200:2  
**formalizing** 219:5  
**formally** 422:9  
**format** 220:3 376:4,7,13  
 376:14,15,20,21  
 379:13,22 380:4,9  
 382:18 408:14 412:6  
 418:2 419:7 431:20  
 439:15,17  
**formation** 101:2  
**formats** 375:22 417:8  
 419:22 427:6  
**formed** 22:6 90:22  
**former** 89:2 188:8  
 351:22  
**forms** 219:5  
**formulate** 22:22  
**formulating** 461:22  
**forth** 118:12,20 210:6  
 235:20 367:13 368:6  
 419:20 472:14  
**Forty** 297:3  
**forums** 44:14 45:20  
**forward** 13:16 14:4,18  
 17:4 26:1 30:13 48:15  
 56:1 99:7 108:12

109:22 152:20 164:22  
 185:22 210:21 224:16  
 228:18 281:13 321:12  
 397:8 466:13 470:2,7  
 470:15  
**forwarded** 321:15  
**foster** 45:2 216:5  
 357:20  
**found** 36:21 61:22  
 83:16 89:21 125:16  
 130:17 152:19 154:22  
 158:5 166:8,11  
 260:13 283:14,19  
 305:21 320:11 345:22  
 385:1 391:3 412:6  
**foundation** 9:1 109:17  
**four** 61:14,22 195:6  
 205:8 235:16,16  
 263:11 276:14 280:10  
 280:18 295:20 305:11  
 332:1,18 336:12  
 343:4 346:19 411:20  
 441:8,14 443:6 461:6  
 464:16  
**four-pilot** 276:14  
**fourth** 221:19  
**FRA** 116:13  
**frame** 23:3 98:5,13  
 160:3  
**framework** 21:20 75:18  
 81:14 128:22  
**frankly** 82:20 257:20  
 262:9 294:22 340:16  
**free** 28:2 68:3 93:12  
 232:13 253:5 271:8  
 327:16  
**free-flowing** 356:21  
**Freedom** 121:15  
**Freeman** 2:9 7:18,19  
**friction** 37:14 40:1 42:4  
 42:16 43:10 45:14  
**friends** 292:12 294:16  
 343:11  
**front** 6:11 22:1 164:17  
 279:19 311:7 397:12  
**frontline** 288:18  
**fruit** 192:7 455:3  
**fruition** 38:3  
**fruits** 37:17 38:2  
**frustrated** 59:19  
**frustrating** 83:16  
**fulfill** 4:15  
**full** 22:18 27:20 39:2  
 87:3 132:16 167:20  
 261:1 293:4 389:14  
 420:10  
**full-out** 382:17  
**fully** 28:20 52:10

141:11,17 165:7  
 171:11 194:1 366:12  
 421:5  
**fumes** 236:16  
**fun** 233:5  
**function** 20:22 431:11  
 456:19  
**functional** 369:15  
**functionalities** 417:6  
**functioning** 164:1  
**Fund** 10:8 60:10 187:6  
**fundamental** 30:8 31:4  
 217:4 373:19  
**funded** 110:1  
**fundings** 7:21 9:12 23:21  
 35:16 37:4,8 75:11  
 88:18,21 103:17  
 104:1,2,4,13 108:3,22  
 109:11,15 113:17  
 172:4 221:7 222:3  
**funds** 108:9 221:11,13  
 221:17  
**funnel** 155:20  
**funnest** 183:18  
**funny** 342:14  
**further** 65:9 78:14 81:4  
 106:21 115:4 118:2  
 142:18 163:14 165:10  
 208:19 406:5 456:19  
 457:14  
**furthering** 149:16  
**fusion** 383:18,21  
**future** 30:17 100:6  
 151:7 152:5 240:21  
 383:21 394:4 396:2

---

**G**


---

**G.E** 210:1  
**gain** 48:20 206:22  
 403:18  
**gained** 56:21  
**Galaxy** 404:10  
**gals** 264:2 306:4 341:17  
**game** 33:13 251:13  
 335:19 345:10,14  
 412:13  
**games** 220:17  
**gap** 71:17  
**gaps** 209:18  
**Gartner** 420:20  
**gas** 8:9,14 31:1 74:3  
 134:17 256:10 343:16  
 344:19 345:4 355:9  
 355:12 375:3,5  
 378:11,14,21 381:19  
 399:12 435:9  
**gasps** 176:14  
**gates** 109:19,19

**gather** 163:3  
**gathered** 146:6 160:11  
 172:10  
**gathering** 34:2 161:2  
**gauge** 112:13 243:9,10  
 244:5 361:8 386:21  
 387:6  
**GE** 11:9 40:6 464:3  
**geek** 405:10 435:6,7  
**geeks** 404:8  
**general** 2:11 15:16  
 44:12 56:12 172:7  
 269:8 277:22 280:19  
 323:18 351:21 359:14  
 378:1 426:14 471:21  
**generally** 41:2 78:13  
 98:2 235:22 240:8  
 314:11 375:20  
**generate** 205:14  
**generated** 164:16 416:3  
 416:6  
**generation** 296:15  
**generic** 97:4 384:10  
**gentlemen** 98:3  
**genuine** 32:4  
**geographical** 372:12  
**geography** 456:20,22  
 457:10 458:2 465:4  
**geometric** 369:1  
**Georgetown** 1:12  
**Georgia** 11:13 150:14  
 168:14  
**getting** 17:14 29:12  
 30:21 37:22 38:4  
 61:21 63:18 64:9  
 65:10 68:19 69:15  
 72:8,13,20 131:6  
 141:6 143:12,14,22  
 152:1 159:2 183:3  
 185:7,15 208:17  
 209:19 213:14 228:3  
 233:21 243:5 244:2  
 258:4 278:17 279:5,6  
 335:22 337:11,12  
 341:5 348:2 365:17  
 369:11 398:19,20  
 405:2 415:22 449:6  
 452:21 460:14 465:19  
**GIS** 380:16,17 391:19  
 392:1 416:21 421:4  
 422:19  
**gist** 52:3  
**give** 29:16 39:19 63:18  
 82:8 93:11 111:10  
 112:8 120:16 131:11  
 134:6,13 144:11  
 148:18 161:9,22  
 162:16 177:8 178:8

189:15 203:13 205:22  
 218:7 224:13 225:22  
 246:7 259:22 262:10  
 272:6 275:11 293:13  
 300:15 305:21 315:21  
 319:9 324:11 325:14  
 327:4 328:2 339:8  
 347:4,10 348:16  
 349:17 375:18 376:6  
 380:4  
**given** 21:7 160:11  
 195:2 206:9 237:9  
 310:21 471:12  
**gives** 231:21 397:4  
 415:19 443:5  
**giving** 59:15 120:10  
 121:8 168:3 341:13  
 421:19  
**glad** 231:21 319:11  
**glance** 218:1  
**glare** 311:4  
**glass** 236:11  
**glasses** 311:18  
**glean** 386:11  
**glimmer** 299:1  
**glimpse** 140:15  
**global** 150:22 159:9  
**glove** 260:19  
**goal** 4:21 5:8 23:1,7  
 34:21 54:4 72:4 115:4  
 149:16 356:15 357:22  
 358:1,3,7 359:10  
 393:2  
**goals** 47:3 73:1 104:15  
 354:13 359:7,16  
 360:19 361:3 374:5  
**God** 176:14 291:1  
**gold** 384:20 423:5  
**goofy** 281:12  
**Google** 413:13 415:16  
 415:17,20 431:1  
 444:1  
**gosh** 271:15  
**gospel** 346:2  
**gotcha** 65:4 161:5,14  
**gotten** 68:1 128:19  
 257:13,14  
**govern** 61:17  
**governance** 7:13 8:16  
 29:14,20 30:9 54:8  
 55:3 76:20 80:2 89:20  
 90:10 92:5 95:1 117:2  
 117:9 129:16 130:4,8  
 136:8 185:13 204:16  
 440:3  
**governed** 90:22 128:6  
 205:3 207:18 442:22  
**governing** 115:11

129:22  
**government** 43:5 93:1  
 104:10 108:1 109:6  
 116:12 146:2 192:21  
 197:19,20 222:1  
 223:22,22 229:12  
 312:19 343:10 411:14  
**Governor's** 229:20  
**GPS** 363:19 368:22  
**grab** 223:14,19  
**grants** 222:5,20  
**granularity** 302:6  
**graph** 425:7  
**graphic** 200:16,20  
 203:3 407:19  
**graphics** 418:14  
**graphs** 421:12  
**grappled** 65:20  
**grappling** 101:12  
**grateful** 27:9,22  
**grease** 285:1,5,10  
 286:5 287:1  
**grid** 420:21  
**grief** 322:11  
**grossly** 65:2  
**ground** 94:19 109:4  
 263:12 286:19 307:19  
 328:18 368:9,18  
**grounded** 201:4  
**groundwork** 462:5,12  
**group** 1:5,12 4:9 5:2  
 8:22 11:18 16:7 18:17  
 19:8 27:8,14 28:14,14  
 28:15 30:9 35:10  
 49:10,10,11 53:16,20  
 55:6 73:15 74:18  
 117:18 118:5 155:13  
 160:5 165:14 175:4  
 190:16 198:22 206:4  
 223:21 225:7,9 226:3  
 244:21 262:1 266:8  
 268:3,7 280:22 281:1  
 283:13 326:1 330:1  
 330:22 348:17 352:11  
 353:7,9 378:7 379:15  
 406:11 414:13,17  
 423:10 426:17,21  
 439:4 460:9 461:20  
**groups** 8:20 54:8,21  
 77:19 80:11 101:10  
 201:7 206:13,18  
 211:2 225:12 286:21  
 324:10 348:22 439:1  
 451:20 453:1,3  
**growing** 455:5  
**growth** 392:19  
**guarantee** 278:13  
 296:16 316:11

**guaranteed** 245:10  
**guarantees** 108:7  
**Guard** 256:13  
**guess** 26:2 60:14 64:2  
 68:22 69:3,9,12,18  
 75:22 92:21 107:21  
 135:19 153:5 157:9  
 165:14 273:7 276:22  
 306:7 308:8 322:7  
 331:16 344:16 396:4  
 398:2 453:6 460:19  
**guest** 23:15 230:16  
 232:1  
**guests** 22:20 73:8  
**guidance** 20:15 71:5  
 300:19 342:18 469:12  
 473:7  
**guide** 21:4 404:9  
**guidelines** 64:19,22  
 117:13 358:20  
**guides** 21:9  
**guiding** 21:3 337:20  
**Gulf** 243:2 256:10,14  
 324:19 342:22  
**guy's** 341:8

---

**H**


---

**habit** 240:11  
**hacked** 435:19  
**Hadoop** 427:10  
**Haiti** 249:21 250:8  
 262:16  
**half** 13:6 195:10 235:18  
 235:19 322:13  
**hall** 5:14 153:14 154:18  
 155:3 171:11  
**hammered** 27:17  
**hammering** 254:20  
 318:3  
**hand** 18:19 125:8  
 194:18 282:12,15  
 327:3 341:3 451:16  
 470:11  
**hand-pick** 390:4  
**handed** 417:12  
**handle** 28:9 93:22  
 212:17 282:13,14,15  
 401:22 435:11  
**handling** 220:8  
**hands** 117:6 118:16  
 124:17 309:17 456:15  
**hang** 40:20  
**hangar** 308:21 309:4,4  
 347:12 348:7  
**hangars** 347:6  
**hanging** 347:7  
**happen** 42:11 43:11  
 47:20 51:16 78:2 98:7

113:21 158:10 176:19  
 184:13 192:8 193:9  
 193:13 249:3,4,13  
 303:13,15 423:19  
 433:14,22 434:7  
 470:18 474:3  
**happened** 176:13  
 238:13 241:15 246:8  
 249:20 251:3 252:16  
 279:22 281:21 286:17  
 294:6,7 307:22 321:3  
 433:9,10,15 457:4  
**happening** 44:15 87:17  
 193:19 245:9 249:3  
 249:14 274:14 379:3  
 382:7 464:7  
**happens** 40:21 42:3  
 44:13 63:8 247:16  
 249:7,18 259:22  
 260:2 261:15 282:18  
 291:2 292:2 299:16  
 300:1 305:22 318:9  
 320:10 346:16 373:20  
 441:4 442:1  
**happy** 145:17  
**harbor** 178:7  
**hard** 48:21 63:3 106:12  
 135:19 174:14 184:18  
 204:1 223:17 245:16  
 246:3 335:1,4 399:3  
 401:11 436:15 459:12  
**hardware** 429:11  
**haul** 236:6  
**haven** 159:19  
**Hawaiian** 263:21  
**hazard** 251:7 350:7  
**hazard/slick** 375:3  
**hazardous** 1:2 91:7  
 236:15 237:11,13,14  
 378:10,11,19  
**hazards** 244:14 286:18  
 316:18 318:18 337:1  
 337:5 340:2  
**hazmat** 307:20  
**HDA** 440:2  
**HDFS** 427:11  
**he'll** 13:21 17:7 231:7  
 462:1  
**head** 182:10 245:17  
 317:17 413:14  
**heading** 424:18  
**headquarter** 16:22  
**heads-up** 236:7  
**health** 10:7 59:12 60:10  
**healthcare** 440:21  
**healthy** 102:22  
**hear** 6:4 12:14 17:4  
 21:16 24:1,4 31:14

51:7 59:1 83:5 87:9  
 103:8 174:20 175:21  
 225:8 236:14 239:6  
 293:14 425:19 462:8  
**heard** 38:15 58:15 82:9  
 83:6 103:5 117:19  
 184:12 215:18 220:10  
 222:2 223:4 225:16  
 225:18 233:5 238:9  
 241:8 256:12 322:9  
 322:12 339:21 342:11  
 390:13 391:5 421:15  
 425:2 426:7 437:14  
 437:15,15 443:9  
 445:2  
**hearing** 11:16 57:20  
 160:9 173:16 214:20  
 215:4 231:4 340:6  
 473:16  
**hears** 346:8  
**heart** 36:15,22 38:20  
**heavily** 109:3  
**heck** 251:6  
**HEI-1163** 447:19  
**held** 220:18 271:10  
 468:13  
**hello** 265:12 402:13  
**help** 20:3 21:4 49:15  
 64:15,17 69:14 78:2  
 81:9 93:3 97:19  
 109:16 125:8 132:2  
 144:5 145:17 160:5  
 186:21 188:22 205:21  
 248:4 249:17 284:19  
 291:16 399:13 404:12  
 438:4 439:12 440:8  
 449:19 450:1 452:16  
 466:8 467:9 468:14  
**helped** 79:5 81:13 82:6  
 82:21  
**helpful** 27:7 43:13  
 47:13 48:11 55:16  
 75:13 78:9 101:14  
 102:15 120:2 144:1,3  
 148:3 167:18 195:14  
 213:9 249:1 272:7  
 401:6,10 441:10  
 469:19 470:20  
**helping** 40:6 57:20  
 160:15 213:8 435:11  
**helps** 20:1 155:21  
 175:16  
**hep** 226:8  
**Hereth** 1:21 8:21,21  
 32:10 33:1,9,18 39:21  
 40:14,22 41:8 73:14  
 73:14 78:11 83:12  
 85:1,1,16 88:9,11,14

96:3 117:17,17 119:1  
 134:5 160:4,4 162:2  
 162:12 165:13,13,21  
 175:3,3 183:6,6  
 210:22 211:21 212:11  
 230:9 231:13 295:10  
 328:7,12 330:2,4,12  
 331:2,5,16 373:7  
 375:7 396:22 398:5  
 430:11 450:7,13  
 451:3,6,9 453:6,10  
**heretical** 463:15  
**Hevle** 2:9 14:1 74:3,8  
 201:21 352:10 355:10  
 355:11 367:16 368:1  
 373:9 375:9 379:9,18  
 381:2,4,7,12,14 382:4  
 382:6,10 383:5,7,13  
 384:3 385:3 387:13  
 387:16 388:3,7 389:6  
 390:20 391:7,18  
 392:16 393:3,5 394:9  
 394:21 396:9 398:13  
 399:9,15 400:3,22  
 401:3,8 460:10,13  
**hey** 115:20 238:16  
 247:12 248:17 252:1  
 252:6 254:22 260:6  
 261:2 274:10 279:2  
 281:14 283:3,18  
 285:11 290:5 293:2  
 293:15 295:18 296:4  
 299:5 312:19 313:5  
 320:21 323:17 324:18  
 326:18 328:20 332:21  
 334:21 341:3 343:1  
 343:12,18 347:10  
 360:1 369:20 372:3  
 380:4,6 382:14  
 393:16 394:10  
**HHS** 322:8  
**HICKS** 175:20  
**hidden** 423:17  
**hide** 58:8 159:13,14  
 426:13  
**hierarchal** 425:7  
**high** 29:5 104:19  
 179:16,18 180:1  
 192:11 234:5 333:20  
**high-** 323:8 405:20  
**high-consequence**  
 374:12  
**high-level** 28:18 167:9  
 174:22 208:8 411:11  
 426:20  
**high-tech** 386:20  
**higher** 57:3 264:20  
 372:20 423:6

**highest** 191:13,20  
**highlight** 264:7 280:8  
**highlighting** 201:11  
**highlights** 201:19,22  
 274:5,6  
**highly** 114:5  
**highway** 1:12 147:19  
 148:3  
**highways** 107:3  
**Hill** 112:10  
**hire** 241:14,22 335:3  
 414:4  
**hired** 216:13,16  
**hiring** 216:6 221:12  
**historic** 84:5 383:1  
**historical** 116:9 370:14  
 371:22 377:14 428:21  
**historically** 375:1 415:6  
**history** 28:4 317:22  
 322:5 362:8 371:15  
**hit** 6:16 91:16 309:7,9  
**Hitchhiker's** 404:9  
**hits** 182:9 400:16  
**hitting** 418:15  
**hold** 6:1 59:15 115:15  
 270:9 304:17,19  
 453:21  
**holding** 270:22  
**holding** 270:6,7,15,21  
 271:16 304:17 446:12  
**holes** 151:10  
**Holly** 2:2 48:5,13 78:5  
 111:8 142:16,17  
 144:3,4,6 171:18  
 172:15 183:14 186:3  
 187:4,6 188:3 212:14  
 222:17  
**Holly's** 28:2  
**home** 289:20 290:13  
 347:9  
**homework** 188:21  
 195:2,5  
**honest** 59:8  
**honestly** 52:21  
**hook** 157:3  
**hope** 162:4 328:5  
 345:22  
**hopefully** 17:16 69:12  
 98:21 196:22 206:21  
 222:11 227:4 237:5  
 294:8 445:16  
**horizontal** 429:6,17  
**horizontally** 431:14  
**horrible** 405:7  
**horse** 34:8 52:9  
**hospital's** 344:5  
**hospitals** 325:4 342:15  
**hot** 111:22

**hotels** 469:2  
**hotline** 288:10,16,16,18  
 289:1 290:10 325:17  
 325:22 336:18  
**hour** 13:6 101:11 102:6  
 195:10,11 235:16  
 254:11 260:22 261:4  
 261:5 270:20,21  
 289:5 319:19 402:2  
 429:13  
**hours** 235:18,19 236:4  
 274:8,14,18 289:3  
 302:12  
**house** 229:19 351:18  
**housekeeping** 5:11  
**Houston** 76:11  
**hub** 80:5 200:14 203:4  
 203:16 216:9 220:22  
 223:8 391:19  
**huge** 56:3 155:11 272:3  
 282:17 315:21 337:10  
 378:4 383:8 394:22  
 416:18 426:17  
**Hughes** 11:9 210:1  
 443:17  
**human** 245:4,5 387:4,8  
 398:7 446:14  
**human-readable**  
 419:22  
**hundred** 384:3 459:22  
**hundreds** 261:19  
 429:11  
**HUNG** 2:10  
**hunt** 154:5  
**hurdles** 423:11 448:8  
 449:6  
**hurt** 242:19  
**hurting** 214:13,16  
**HVLEs** 192:2  
**hydraulic** 295:20,21  
**hypothesis** 159:6

## I

**IBM** 413:13  
**ice** 236:1 289:15,18  
 290:1  
**icon** 446:15  
**icons** 407:21  
**idea** 50:11 51:6 59:22  
 80:12 87:2 101:20  
 103:21 107:9 142:11  
 171:13 172:16,20  
 178:6 181:17 211:1  
 238:18 242:7 280:7  
 293:16 294:17 295:19  
 311:2 317:17 340:10  
 409:9 413:1 416:17  
 417:15 419:18 421:22

423:20 425:12 428:14  
 428:15 429:6 430:3  
 436:14 438:18 441:2  
 442:21 447:13,13  
 454:11,13,20 458:7  
**ideal** 112:20  
**ideally** 413:4  
**ideas** 14:14 56:15  
 226:18 228:5 412:17  
**identifiable** 383:15  
 440:17 441:3 443:11  
 443:19 458:2  
**identification** 30:11  
 32:13 33:6 205:4  
 367:3 441:5  
**identified** 61:11 62:4  
 89:18 114:4 127:6  
 133:5 136:12 147:10  
 154:21 220:8 317:7  
 334:9 356:7 459:1  
 466:18  
**identifier** 117:8  
**identifiers** 232:16  
**identifies** 186:15 337:1  
**identify** 31:22 36:17  
 52:14 55:10 61:7,11  
 89:14 101:9 131:19  
 151:10 168:1 173:8  
 186:10 201:1 245:1  
 268:5 286:18 337:4  
 362:15 372:18 386:14  
 388:9 438:4  
**identifying** 31:11,14  
 153:19 316:18 363:12  
 444:3  
**IEP** 295:3  
**ILI** 36:1 75:20 91:15  
 92:10 93:5 96:5,15  
 97:13 100:2,10 170:4  
 201:13 202:2,7,12  
 203:5 211:13 216:12  
 218:18 225:19,19  
 227:3 353:3 354:9  
 356:20 359:4,6,8  
 360:18,22 361:2,4  
 362:13 363:3 364:5  
 365:10 372:11 374:11  
 376:4 379:6,18  
 380:13,14 382:20  
 384:22 389:11 393:10  
 400:9 407:8 408:5  
 412:4,7 423:21 430:4  
 432:20 438:13 444:11  
 445:6 447:5,20  
 452:18,20 454:21  
 456:2,12 459:2  
 463:21 464:7,8,11  
 465:7

**ILI** 218:14  
**ILI-PQ** 355:1 357:10  
 358:9,13  
**ill** 12:20  
**illustrate** 408:1  
**illustrious** 230:22  
**image** 373:3,5  
**imagine** 260:22 339:13  
 374:13  
**immediately** 5:12 6:9  
 6:10 135:10 174:20  
 264:22 265:8 300:17  
 357:4 442:6 454:3  
 465:3,7  
**imminent** 133:21  
 134:19 135:1,9  
 137:13 139:1,2 140:3  
**immortalized** 460:12  
**immunity** 149:1,7  
 150:14 166:7 177:1  
 177:15 178:3 180:8  
 188:11  
**IMP** 374:12  
**impact** 71:17,21,22  
**impairment** 180:3  
**impart** 176:3  
**impediment** 36:13  
 43:18,19  
**impediments** 84:7  
**implement** 66:10  
 157:14 184:4 427:15  
**implementation** 38:7  
 219:12  
**implemented** 384:17  
 425:10  
**implementing** 411:9  
 460:17  
**implications** 449:22  
**implies** 153:17 255:11  
**import** 376:11 380:13  
**importance** 41:12 48:8  
 83:3,8 126:7 461:12  
**important** 25:5,9 33:10  
 55:10,12 68:19 79:10  
 82:14 97:13 102:19  
 105:21 110:3 116:6  
 122:21 124:5,11,22  
 125:22 126:5,14  
 137:2,3,5,7,8 139:10  
 167:1 172:11 176:7  
 185:21 186:6,10,11  
 186:17 204:7 211:16  
 225:6 248:7 252:20  
 254:17 262:6 266:11  
 266:15 270:4 271:18  
 281:10 284:3,16  
 289:10,11 301:5  
 317:19 321:4 329:17

359:5 363:21 366:1,7  
 368:22 373:12,15  
 374:22 377:13 383:17  
 389:7,7 396:10  
 400:11 404:6,20  
 405:3 409:1,15  
 419:15 420:17 428:1  
 429:9 431:7 432:8,14  
 432:22 436:4,21  
 437:8,21 438:6  
 453:17 456:4 467:18  
 470:6 471:7,9  
**impossible** 287:6  
**improperly** 289:18  
**improve** 34:13 42:13  
 66:6 155:21 170:18  
 218:17 227:12 386:14  
 386:17 439:19 455:4  
**improved** 104:6 157:3  
 227:13 332:22  
**improvement** 85:8  
 192:12 204:5 225:9  
 227:2,11 228:4  
 357:21 358:2 377:19  
 384:21 388:6  
**improvements** 38:19  
 148:21 149:16  
**improves** 4:20 445:17  
**improving** 32:19 34:14  
 34:21 91:6 115:5  
 228:1 452:11,14  
**in-** 209:12  
**in-ditch** 389:4 390:18  
**In-line** 3:13 14:2  
**in-the-ditch** 202:12  
 397:20 398:3  
**inaccuracy** 385:22  
**inadvertent** 241:21  
 302:15 304:13 318:5  
**inadvertently** 165:11  
**inappropriate** 269:16  
**incentive** 36:3 41:9  
**incentives** 47:8  
**incentivize** 48:9  
**incidences** 465:6  
**incident** 32:1 41:14  
 106:13 118:19 155:10  
 179:17,18 182:12  
 430:7,7  
**incidents** 30:18 32:3  
 41:6 70:9 81:18 83:17  
 86:12 87:8 104:7  
 106:12 175:10 203:8  
 238:4 392:7 400:16  
 452:11 454:22 463:21  
 464:6  
**include** 103:13 166:16  
 180:14 220:2 364:3

376:5 379:16 380:2  
383:11  
**included** 20:6 92:12  
100:22 164:5 374:2  
378:2,2,13 386:3  
452:4  
**includes** 82:11 175:8,9  
288:7 356:20 357:7,9  
358:15,18,22 377:21  
**including** 29:20 63:14  
114:8 180:20 183:7  
219:8 335:15 355:1  
367:4 383:1  
**inclusion** 167:13  
**inclusions** 372:22  
**inconsistent** 139:21  
**incorporated** 217:16  
358:10 378:9  
**incorporates** 34:5  
354:22  
**incorporating** 167:6  
**incorrectly** 242:6  
289:14 326:14  
**increase** 218:19 356:15  
364:12  
**Increased** 33:16  
**incredibly** 27:7 425:8  
427:10,22 428:2  
432:13  
**incremental** 70:11  
**indemnification** 67:19  
**indemnified** 185:2  
**independent** 51:1  
61:10 71:3 305:20  
**independently** 327:10  
**indicated** 368:17  
**indicates** 143:4  
**indication** 187:19  
**indications** 363:8 396:8  
**indicators** 228:7  
**individual** 53:3 57:22  
62:16,21 67:3 69:22  
245:4 304:9 397:16  
**individuals** 6:5 20:9  
**industries** 10:14 181:13  
199:21 248:9 344:9  
**Indy** 260:9  
**inertia** 40:18 45:15  
**inevitably** 458:1 465:7  
**infer** 441:13  
**influence** 187:18 217:8  
**inform** 435:11  
**informal** 400:4  
**information-rich** 219:1  
**Information-Sharing**  
1:4,11  
**informational** 383:19  
**informative** 23:22

**infoshare** 86:1,2,4  
280:9,13 281:7  
300:22 307:18 308:12  
321:9,10  
**INGA** 219:4  
**INGAA** 9:1  
**inherent** 48:19,20  
119:14 140:5  
**inherently** 455:6  
**inhibit** 205:6  
**initial** 23:1 28:6 29:12  
35:17 38:5,7 81:14  
159:6 219:10 363:17  
369:18 372:17 397:4  
**initially** 34:1 37:15  
63:12 109:4 116:18  
377:11  
**initiating** 166:6  
**initiation** 86:9  
**initiative** 66:5  
**injure** 177:19  
**injured** 297:15  
**injuries** 297:11 301:14  
**injury** 297:7,12  
**inline** 63:13 96:22  
210:10 351:16 355:2  
355:14 357:9,11,16  
358:15 368:3 373:2  
373:20 388:22 390:17  
415:2 422:2  
**innovating** 421:1  
**input** 21:2,6 22:19 23:6  
24:4,6 25:20 73:9  
83:2 204:10 206:6,10  
218:7,8 220:3,3  
227:10,14 320:2  
331:12  
**inputs** 20:22  
**inputted** 126:9 320:4  
**inside** 49:6,14 176:17  
223:7 343:14 360:8  
367:20  
**insight** 75:11 433:4  
**insightful** 469:7  
**insights** 433:3  
**inspect** 42:2 71:16  
**inspecting** 71:21  
**inspection** 3:13 11:10  
14:2 49:9 63:13 91:1  
91:4 97:1 158:1  
210:10 351:17 355:3  
355:14 356:14 357:9  
357:11,16 358:15,22  
360:9 368:4,10  
373:20 389:1 390:18  
390:19 393:9 415:2  
422:2 459:2  
**inspections** 159:3

390:2 458:13  
**inspector** 63:8  
**inspectors** 155:6 159:4  
**install** 415:9  
**instance** 107:1 129:1  
178:13 256:11 333:18  
**instances** 187:21  
**institute** 220:15  
**institution** 8:2  
**instruct** 219:18  
**instruction-led** 221:18  
**instructional** 221:16  
**instructions** 326:14,21  
377:4,8,9,10 452:18  
**instrument** 272:9  
310:16,17  
**instrumental** 233:21  
**instrumentality** 123:12  
**instrumentation** 236:11  
**instrumented** 361:6,10  
**insufficient** 125:11  
373:3  
**insurance** 182:7 324:10  
**insure** 392:19 393:9  
**integrate** 103:7  
**integrating** 103:6  
**integration** 103:16  
110:14 111:1 372:8  
428:12 465:5 466:11  
**integrity** 7:3 10:11  
44:21 91:3 166:17  
171:2 221:2 357:22  
393:11 436:2,18  
**intellectual** 42:17  
**intelligence** 434:20  
**intend** 95:18 198:13  
**intended** 177:19 180:13  
373:5  
**intending** 360:17  
**intent** 47:2 57:8 64:13  
64:13 72:11,17 73:2  
100:9 115:2 120:9  
124:11 126:6,6 127:2  
139:4 142:4 143:1,17  
145:3,22 149:18  
153:18 159:17 167:9  
173:21 211:5  
**intention** 162:5  
**intentional** 65:2 156:2,9  
177:17 240:8 273:6  
303:20 304:2  
**intentionally** 123:16  
149:8 156:3 187:17  
300:14 302:21 304:4  
350:17 430:12  
**interact** 200:17 365:11  
**interaction** 79:18 93:4  
200:15 356:8 465:8

**interconnections**  
467:21  
**interdependencies**  
207:10  
**interest** 14:16 439:11  
**interested** 15:10 37:11  
87:9 225:15 231:3  
248:10 254:2 346:6  
414:16  
**interesting** 25:12 28:11  
83:2 118:7 191:4  
238:9 290:16 324:21  
346:1 367:12 439:6  
442:3,5 443:22  
**interface** 80:10 322:22  
415:16 416:17 423:19  
**interfaces** 417:14  
**internal** 192:15 363:8  
457:1 470:11  
**internally** 109:6 125:7  
395:2  
**international** 234:20  
274:16 312:1,3  
**Internet** 289:4,8  
**interplay** 112:17  
**interrelationship** 78:17  
**interrupt** 462:13  
**interview** 270:12  
**intimately** 47:10  
**intrinsic** 32:20 35:10  
43:15 136:12  
**intrinsically** 152:1  
**introduce** 12:5 13:19  
232:6  
**introduced** 20:3 231:1  
428:13 430:1 445:10  
**introducing** 105:15  
447:10  
**introduction** 22:2 78:19  
**Introductions** 3:3  
**inverse** 300:2  
**investigate** 305:1  
**investigated** 367:4  
**investigation** 36:2  
61:17 66:20 84:1  
123:14 163:14 185:3  
271:22 299:11 305:20  
313:19 387:20  
**investigations** 123:15  
**investigative** 185:1  
**investment** 104:21  
105:6,8,9,12,13 106:8  
107:8  
**investments** 105:22  
**invite** 145:15  
**invited** 23:16 450:18  
**involve** 68:19 330:21  
360:21 361:5,9 368:5

457:10  
**involved** 45:17 47:10  
 50:1 59:11 87:12,15  
 106:22 117:11 179:16  
 189:10 190:22 205:16  
 228:3 238:17 244:16  
 254:1 282:22 284:15  
 302:20 329:15 330:5  
 331:10 345:11 351:7  
 473:13  
**involvement** 37:8 46:8  
 48:9 193:5  
**involves** 361:4,5,8  
**iPad** 297:16 299:19,20  
 301:7,9,14 347:8  
**iPad's** 300:7  
**iPads** 297:17 300:12  
 347:22  
**iron** 111:22  
**ironically** 96:20 319:15  
**Island** 181:4,8  
**issue** 26:2 58:8 61:8  
 63:7 64:11 67:20,21  
 105:14 115:6,10  
 129:21 137:3 144:19  
 152:6 269:12,13  
 277:5 290:11 319:21  
 319:22 470:17 473:13  
**issues** 16:19 27:4,17  
 67:17 72:22 73:5  
 86:19 180:7,11  
 182:13 185:11 186:14  
 192:9 269:15 296:11  
 320:12 396:6 463:4  
 466:17 467:5  
**issuing** 18:13 135:14  
**it'd** 63:16 257:15 260:17  
 290:1  
**it'll** 109:16 261:3 324:16  
 346:18  
**ITD** 201:13  
**item** 3:18 229:11  
 268:21,21 291:18  
 293:11,11 295:7,12  
 311:9 351:16 401:12  
 401:14,22 466:14  
**items** 5:4,11 14:12,20  
 88:13,14 195:2 208:5  
 208:7 279:12 290:22  
 291:10 293:4 295:4  
 295:17 303:11  
**iterations** 23:5

---

**J**

---

**jack** 260:9  
**jacks** 260:12  
**jail** 68:3 271:8 313:8,10  
 313:16,17,20

**janitor** 181:15  
**janky** 260:6  
**Jaques** 89:1 188:7  
**Jason** 1:19 110:7 111:3  
 113:9 201:13 224:13  
 226:9 402:7,9,12,14  
 402:19 410:3 411:4  
 424:11 452:1 460:4  
 465:15  
**Jason's** 406:13  
**Javascript** 417:9  
**Jefferson** 301:1  
**Jensen** 1:21 11:2,3  
 196:17 199:2 213:13  
 213:14 214:11,15,20  
 215:9 223:2 254:22  
 255:2,2,5,10,22  
**jet** 236:13 263:21  
 299:22 316:19  
**Jim** 74:9  
**job** 28:19 58:21 123:22  
 181:9 216:1 221:12  
 225:1 237:20 276:3  
 402:9  
**jobs** 181:18  
**Joe** 2:3 9:5 28:2 37:12  
 42:5 45:15 71:10  
 202:15 203:1,8,18  
 210:19 212:22  
**Joe's** 39:22 203:17  
 207:16,21 210:19  
**John** 2:1,8,12 10:20  
 13:14 48:16 112:22  
 120:5 126:22 127:16  
 147:3,4 189:6,7  
 190:15 206:20 230:16  
 230:21 231:6 232:5  
 234:13 245:14 254:22  
 270:15 271:15 274:10  
 301:5 320:16 352:13  
 367:11 377:4  
**John's** 234:12 340:19  
**Johnson** 199:4 201:13  
 202:6  
**join** 15:12 36:4 63:1  
 76:13 199:6 217:13  
 217:21 256:20 345:18  
 431:19  
**joined** 5:18 12:19 13:18  
 75:3 231:1  
**joining** 4:4,8 13:14,22  
 230:17  
**joint** 69:13 179:15  
**Joking** 460:15  
**Jones** 1:22 10:6,6  
 58:20 60:10,21  
 178:19 181:3 182:6  
 182:22 189:2 194:19

258:7,9,13,15 259:1  
 380:18 381:3,5,11,13  
 382:1,5,9,16  
**JSON** 417:9 418:13  
 419:22  
**Judge** 308:6  
**judged** 330:7  
**judging** 330:14  
**judgment** 395:21  
**judicial** 148:9  
**July** 76:10 77:7 78:15  
 110:12 208:10 401:19  
 468:13  
**jump** 158:19 181:20  
 341:7  
**jumped** 321:14 465:3  
**junction** 25:2  
**June** 1:9 16:10 23:14  
**jurisdictional** 97:9  
**justification** 106:16  
 112:1  
**justify** 104:22 365:1  
**justifying** 106:9

---

**K**

---

**Karen** 2:10 7:15 469:8  
**Kate** 1:18 8:17 38:22  
 39:4 96:2 97:22 98:16  
 102:1 163:15,16  
 207:6 265:11 322:8  
 467:10,11 472:19,20  
**Kate's** 127:14  
**KDIs** 445:15  
**keen** 412:16,22  
**keep** 6:3 24:7 26:12  
 47:19 86:18 102:13  
 102:16 132:13,14  
 133:1 167:8,19,21  
 183:8 192:8 199:16  
 201:4 212:4 235:19  
 242:8 262:8 286:6,10  
 304:7 325:8 327:5  
 332:12 407:5 416:1  
 418:15,19 421:14  
 440:22 443:8,14  
 454:4  
**keeping** 225:2 336:14  
 401:18 422:19  
**keeps** 68:15 185:15  
 212:3 238:1  
**kept** 176:17 271:17  
 273:20  
**key** 22:2,3,7,22 25:21  
 29:8 30:3,10,21 38:4  
 39:8 56:16 85:4,10,17  
 103:8 125:8 140:21  
 151:9 155:18,19  
 167:7,15 224:11

227:21 228:6 233:20  
 248:14 272:5 356:7  
 358:3 399:1 439:12  
 442:11,14 466:11  
**keys** 58:1 84:17 442:13  
**kick** 24:13  
**kicked** 23:10  
**kid** 241:22 242:6 260:18  
**kidding** 81:8 297:14  
**kids** 244:2 247:2 284:18  
 318:7  
**Kiebia** 198:20  
**kill** 242:20  
**killed** 325:4  
**Kinder** 2:9 9:10 39:10  
 46:7 50:7 74:8 88:20  
 94:9 355:8,11 376:12  
 384:15 389:2 441:8  
 441:11,17 442:4  
 443:13,14  
**kinds** 86:14 178:16  
 192:1,9 428:4 454:2  
**kit** 296:19,20,21 297:8  
 301:6  
**knew** 15:4 42:7  
**knock** 246:15  
**knocks** 459:12  
**knowing** 80:19 84:17  
 116:19 456:5 468:15  
**knowingly** 178:1  
**knowledge** 75:11  
 158:21 205:16 216:3  
 243:21 377:6 398:9  
**known** 11:6 68:8,9  
 299:21 419:3  
**knows** 151:6 259:17  
 283:17 291:11 292:21  
 350:12  
**KPI** 439:18  
**KPIs** 228:6

---

**L**

---

**L.A** 245:10  
**label** 286:2  
**labor** 10:9 11:1 37:17  
 38:3 100:22 281:2  
 349:3 403:12  
**Laborers** 10:8 60:10  
**lack** 104:3 121:5 180:8  
 454:19  
**lacks** 98:2  
**laid** 94:19  
**lake** 134:18 300:3  
 421:15 422:7,10  
 430:8  
**Lakes** 135:8  
**LaMONT** 2:1 10:10,11  
 111:6 166:3,14

- land** 95:1 272:21  
273:11  
**landed** 276:11  
**landing** 276:21 312:13  
**language** 93:20 95:9  
97:7 104:16 116:3  
117:4 119:16 122:17  
123:2 129:10 130:19  
132:1 136:5 142:1  
145:9 146:18 158:13  
163:19 179:12 180:14  
183:8 188:6 189:11  
202:17 216:14,19  
417:10 424:5 467:2,4  
472:14,16  
**laptop** 347:11,13  
374:16,18 460:8  
**laptops** 347:7,9 374:17  
374:18 429:2  
**large** 39:16 170:13  
287:7 324:18 334:8  
404:1 411:10 420:6  
**larger** 112:7 170:7  
218:3  
**largest** 271:20  
**Las** 298:3,4,5,22  
**laser** 398:14  
**lasted** 101:11  
**lastly** 207:7 218:2  
220:22 221:5  
**lasts** 267:15  
**lat-long** 391:16  
**late** 269:10 284:13  
302:14 349:10  
**latitude** 118:12  
**Laughter** 72:5  
**launch** 368:11  
**launcher** 368:11  
**law** 67:22 71:15,17 72:3  
91:9 144:17 147:19  
**lawmakers** 463:22  
464:5  
**laws** 69:8 120:8  
**lawsuit** 46:18 68:15  
87:14  
**lawsuits** 87:8  
**lawyer** 89:3 188:8,15  
**lawyers** 87:22 259:3  
**lay** 109:17  
**layer** 392:1  
**layers** 245:3  
**laying** 368:8  
**layover** 236:4  
**LDC** 39:15  
**lead** 34:4 45:17 64:16  
176:9 227:13 458:2  
**leader** 44:2 49:6,14  
51:3  
**leaders** 226:14  
**leadership** 52:19 79:2  
348:13 350:6  
**leading** 33:2,3 34:10  
49:16 196:4 198:22  
401:17  
**leads** 34:22 35:1 196:1  
323:13  
**leak** 36:2 61:17 154:16  
155:10 220:18  
**leakage** 153:11,12,18  
154:4  
**learn** 128:11 175:9,10  
178:11 335:4  
**learned** 46:11 52:1 56:9  
57:1 64:6 104:2  
128:21 134:20 157:1  
203:7 208:22 219:2  
234:7,9 279:14 332:1  
332:2 334:22 348:1  
400:18 403:16  
**learning** 37:20 41:12  
50:9 81:17 85:4,11,17  
118:3,15 192:11  
202:18 209:3 225:17  
325:8 413:18 424:20  
433:20  
**learnings** 81:16 82:3,11  
83:4 88:3 103:11,15  
191:14,20 192:5  
194:2 203:7 204:4  
209:6 400:11  
**leave** 4:7 6:8 40:10  
70:10 196:11,18  
229:21 277:14 281:16  
319:1,13 473:17  
**leaves** 132:19  
**leaving** 319:22  
**led** 100:12 433:16  
**leeway** 64:21  
**left** 17:12 18:15 19:7  
39:8 270:7 463:10  
464:21  
**legal** 7:21 9:12 10:2  
28:14,15 35:10 54:6,7  
76:21 87:8 88:4,17,21  
89:6 99:22 144:19  
172:4 173:7,12  
186:15 474:4  
**legged** 253:16  
**legislation** 28:16,17  
90:19,20 91:17 97:14  
98:9 99:16,17 100:5,6  
114:20 121:12 128:5  
131:9 133:11 147:5  
147:14 168:2 176:21  
**legislative** 40:7 64:20  
127:12 132:8 172:18  
**Leif** 1:21 11:2 28:1  
199:1 213:14 255:2  
**lend** 39:12  
**lengthy** 101:8  
**lesson** 335:1  
**lessons** 52:1 64:6  
101:16 157:1 203:6  
219:1 234:7 279:14  
304:11 325:8 348:1  
400:18  
**let's** 30:8 41:18 45:6  
64:6 89:17,18 92:20  
103:22 121:4 133:3  
147:9 148:10 153:10  
154:1 155:16 156:22  
157:18,19 158:2  
176:5 232:17 242:8  
246:4 250:19 256:11  
256:20 260:20 269:4  
281:16 304:7 321:6  
334:1 335:7 382:12  
412:5 417:16 438:9  
446:16 473:20  
**letter** 123:19 232:16  
278:4 472:21  
**letting** 252:8 466:4  
**level** 29:5,5,22 33:12  
49:12 57:4 69:22  
70:17 141:16,19  
234:6 249:8,10,11,12  
366:4,21 370:12  
371:1,8,18 372:13  
374:7,7,7 383:19,20  
383:21 384:1 385:22  
396:3 399:17 406:21  
422:12 423:6 424:2  
442:22 447:5,6  
457:11 458:6  
**levels** 86:3,21 104:14  
111:17 298:18 358:16  
370:10 372:18,20  
389:17,21 394:2  
**leverage** 93:3 135:21  
201:7 203:11  
**liability** 155:11  
**lie** 302:21 303:17  
**lied** 401:3  
**life** 10:14 236:2 404:17  
415:12 469:20  
**life-cycle** 449:15  
**lifecycle** 109:10  
**lifted** 124:15  
**lifting** 339:11  
**light** 297:22  
**lightbulbs** 264:12  
**lights** 282:8 298:6,16  
298:19,21 299:6  
**liked** 175:15  
**likelihoods** 392:13  
**Likewise** 471:10  
**limit** 148:1 169:4 360:8  
362:3  
**limitation** 396:20  
**limitations** 364:7  
**limited** 124:16 125:6  
126:5 146:3 382:20  
**limits** 147:1  
**line** 4:6,7 11:10 42:12  
146:21,22 158:8  
237:6 261:16 330:21  
362:9 370:15 385:20  
385:22 386:10 388:1  
388:11 407:7 456:3  
456:14  
**line-item** 376:6  
**linear** 434:2 454:16  
**lined** 237:5  
**lines** 2:12 56:20 165:11  
388:10  
**link** 16:3 17:10 47:11  
227:16  
**linked** 391:22  
**links** 16:3 144:15  
**liquid** 30:22 74:4 91:7  
399:12  
**liquids** 48:18 378:10,11  
378:19  
**list** 15:8 20:20 74:1  
102:3 187:20 195:2  
215:21 224:19 280:2  
283:22 407:22 418:5  
451:22  
**listed** 5:4 17:1 37:14  
187:8 217:14 250:11  
254:9  
**listen** 246:15 326:19  
**listening** 14:14,17  
171:20 213:22 215:12  
319:10  
**literally** 218:17 422:21  
425:22  
**literally-used** 452:1  
**literature** 217:19  
**lithium** 285:11  
**litigation** 84:5,14  
114:16 147:11,17  
149:13  
**little** 13:19 14:8 18:9  
28:4 29:6,6 60:17  
62:15 63:2,16 75:17  
79:8 93:13 97:4,12,17  
98:1 100:13 113:3  
131:3 134:6 142:18  
175:21 176:16 196:21  
198:12 200:5 211:9  
215:10 218:3 225:22



227:4,18 231:2,6  
 232:6,11,19,22  
 236:10 237:16 238:8  
 239:21 240:14 246:3  
 251:22 264:15 266:13  
 266:14 281:13,17  
 290:1 293:6 294:13  
 299:9,9 300:20 301:8  
 301:9 302:14 316:3  
 320:20 322:22 323:10  
 331:3 341:5,13 344:1  
 352:17 355:18 357:17  
 358:4 362:4,9 375:5  
 380:19 386:22 394:1  
 394:3 416:16 432:16  
 443:5  
**live** 289:3 346:3 409:2  
 448:1  
**lively** 227:7  
**lives** 346:4 391:13  
 433:5  
**load** 368:10 391:20  
 419:4,15 452:18  
**loaded** 307:19  
**loading** 365:6  
**loads** 297:5 426:11  
**local** 133:13 144:12  
 219:8 308:1 425:5  
**locate** 362:14  
**located** 15:19  
**location** 16:18 117:8  
 259:11 361:11 368:19  
 395:19 415:15 428:16  
 437:19 455:6  
**locations** 330:19  
 332:15  
**logistical** 14:12 358:20  
**logo** 444:22  
**logos** 427:13 439:20  
**long** 39:11 50:12 59:7  
 62:2 88:6 105:7  
 158:16 195:2 237:6  
 267:16 292:9 321:1  
 385:14 450:10 455:2  
**longer** 275:18 300:21  
**looked** 92:18 104:1  
 134:10 135:6 251:5  
 253:4 258:4 297:21  
 298:1 299:22 311:12  
 327:11 405:15 438:14  
**looking** 13:16 14:4  
 15:17 16:6 17:4,17  
 29:9 31:10 54:17 55:3  
 60:7 65:8 71:6 75:5  
 81:1 89:15 99:15  
 103:4 106:19 153:6  
 180:7 186:8 190:18  
 203:22 204:21 205:13

205:17,18 206:17  
 212:15 225:19 226:14  
 226:22 236:6 254:19  
 256:18 265:10,12  
 272:20 273:2 281:20  
 285:14 299:9 324:7  
 336:18 340:1 343:15  
 344:10 350:20 352:8  
 361:19 375:1 377:14  
 387:9 393:16 400:14  
 406:7 415:18 416:6,9  
 421:11 422:22 423:8  
 426:3 427:4 453:4  
 454:20,21 457:7,7  
 465:20 466:13,20,22  
 467:2  
**looks** 17:2 28:22 33:13  
 80:5 141:15 165:22  
 212:16 243:11 265:13  
 265:22 281:12,12  
 285:14 405:7 450:2  
**loop** 68:16  
**loose** 45:15,18  
**loosely** 300:5  
**LOSA** 295:3  
**lose** 25:7 72:6 96:10  
 191:20 232:14 276:2  
 323:9 366:3 472:14  
**loss** 359:11,15 372:21  
 458:12,12,16,19  
**lost** 82:4 98:14 214:18  
 276:3 390:9  
**lots** 86:3 240:22 409:10  
 416:12  
**loud** 455:22  
**louder** 39:17 113:4  
**Louisiana** 246:10  
**love** 83:14 84:10 97:19  
 98:4 235:8,13 317:11  
 335:11 346:1  
**low** 12:9 192:7 260:3  
 267:11 298:18 325:5  
 457:1  
**low-hanging** 455:3  
**lower** 362:3 372:18  
**lowest** 370:12  
**lowly** 347:15  
**Luckily** 429:1  
**lucky** 351:22 416:7  
**lunch** 13:5,5,7,8,11  
 15:3,4,5,11,13 195:9  
 195:11,11 196:21  
 197:3,5  
**Lyft** 107:1  
**lying** 303:4,16,16  
**Lynch** 2:10 7:14,15  
 469:9

---

**M**


---

**ma'am** 262:13 322:7  
 342:8  
**MACE** 357:9 358:10  
**machine** 225:17 260:4  
 419:22 423:8 424:19  
 433:20  
**machine-** 413:17  
**MacNEILL** 2:1 10:20,20  
 189:7,7 190:7,20  
**macro** 174:13  
**Madam** 25:13 55:14  
 98:19 101:19 126:22  
 139:17 169:17 194:22  
 196:10  
**Madison** 195:16  
**magic** 420:21  
**magically** 412:6  
**Magleky** 225:14  
**magnet** 368:18,19  
**magnetic** 364:15 370:2  
**main** 5:1 6:10 353:17  
 444:2  
**mainframe** 425:10  
**mains** 157:21  
**maintain** 90:1 91:13  
 306:19 444:13  
**maintaining** 366:6  
**maintenance** 240:13  
 260:7 263:10 281:6  
 282:21,22 283:2,13  
 307:11 308:14 326:13  
 328:8,10 329:13  
 331:6,20 338:22  
 339:2 347:5 348:2  
 362:8  
**maintenance-** 331:5  
**major** 39:7 56:11 237:4  
 296:11 334:5,5  
 365:10 427:7 457:16  
**majority** 269:20  
**makeup** 27:11  
**making** 25:8 31:12 37:5  
 50:1 75:6 113:17,20  
 124:11 127:1 131:21  
 140:21 168:7 189:14  
 248:11 308:7 317:14  
 317:15,18 325:8  
 327:19 332:20 369:11  
 387:5 425:11 437:1  
 470:22  
**MALE** 279:4 283:21  
 336:3  
**man** 235:10 242:19  
 278:14 345:18 348:8  
**manage** 54:20 199:5  
 201:6 329:21 335:18  
 340:1  
**managed** 53:17 54:19  
 54:20 414:1 471:21  
**management** 55:22  
 56:3 57:10 78:18  
 91:11 104:20 117:11  
 128:1 166:17 172:2  
 183:11 201:14 230:21  
 231:5 235:5 288:3,6,7  
 316:17 336:4,6 337:4  
 338:9 344:6 346:13  
 358:1,2,21 365:3,8  
 377:1,22 378:5  
 403:22 406:10 409:10  
 409:19 415:7 424:16  
**manager** 2:12 8:18  
 105:16 235:4 264:5  
 266:17 282:2 283:1,2  
 285:20 326:7 337:21  
 339:4,6,7 355:12  
**managers** 330:18  
 332:14,18  
**manages** 178:16  
**managing** 8:22 49:11  
 338:9 411:10 421:5  
**mandate** 134:16 142:7  
**mandated** 154:17  
**mandates** 94:12  
**mandatory** 90:12 190:4  
 294:19  
**mankind** 297:18  
**manner** 178:15  
**manual** 260:20 261:17  
 261:18 297:5 299:22  
**manuals** 250:12 261:19  
 297:7 300:20 301:7  
**manufacturer** 292:5  
 295:15,18  
**manufacturers** 180:20  
 180:21 293:14 296:9  
 324:19  
**map** 416:20,22,22  
 417:1 431:15,18  
**MapReduce** 431:10,11  
 431:13,15 432:3  
**maps** 415:20  
**March** 288:5  
**margin** 388:1  
**marginal** 362:8  
**marijuana** 179:14 181:5  
 181:6  
**mark** 1:21 8:21 39:1,16  
 39:18 73:14 83:11  
 85:1 96:1,17,20 102:4  
 103:6,9 117:16,17  
 134:4 156:12 160:4  
 163:14 165:12,13  
 166:15 175:1,3,15  
 183:5,6 191:15

- 199:15 200:8 207:7  
208:11 212:10 226:6  
226:10,12 267:7  
284:12,20 353:5  
403:9,16 405:11  
430:11 444:21 446:21  
450:6 458:21,22  
**Mark's** 17:4 176:1  
407:17  
**markers** 368:9,16  
**marking** 289:7  
**marks** 458:20  
**Markup** 417:10  
**marry** 315:3  
**masking** 443:3,7  
**mass** 30:22 38:5,15,18  
**massive** 298:20  
**master** 354:8 431:16  
**matches** 103:19  
**mate** 273:6  
**material** 22:10 237:13  
352:13 367:8 456:6  
**materialize** 37:17  
**materials** 1:2 217:10  
377:18 450:21 465:14  
**mathematicians** 216:16  
**matter** 22:1,20 26:7  
44:20,20 67:13 98:16  
139:18 180:13 198:1  
224:1 256:20 258:2  
352:2 428:9 432:3  
474:12  
**matters** 441:21  
**mature** 396:14 433:12  
434:19  
**matures** 37:15 164:11  
**Max** 198:20 236:21  
**Mayberry** 1:16 20:12  
34:19 41:17 43:20  
47:17 51:9 58:4,18  
63:2,5 71:8 72:4,6  
92:20 95:6,12 107:20  
107:20 108:15 119:5  
120:13 135:3,13  
137:1 140:8 150:10  
150:17 156:15 159:10  
159:17,21 162:8  
164:19 183:15,15  
184:3 338:21 339:11  
339:15 394:10 395:22  
397:22 462:7 471:20  
472:2,5 474:6  
**mayor** 251:9  
**McClaren** 198:21  
**McLean** 1:13  
**McVey** 273:20  
**mean** 28:22 60:15 65:1  
65:11 111:19 137:16  
185:3 239:16 250:19  
258:2,21 274:21  
276:4 297:14 305:12  
309:4 311:14,20,22  
323:6 324:4 327:7  
338:15 341:14 343:14  
347:6 349:22 351:5  
373:13 382:11 384:4  
391:16 392:12 393:7  
394:13,19 395:1  
398:20 412:12 416:2  
435:16 436:14 442:13  
446:10 453:20 456:17  
458:5 459:16 460:1  
472:22 473:13  
**meaning** 67:11 219:19  
404:16  
**meaningful** 407:13  
409:7 428:6 438:10  
438:11 439:22 447:1  
**meaningfully** 430:13  
**means** 60:20 66:19  
122:4 126:15 127:12  
129:16 138:11 152:11  
159:8 167:4 195:9  
276:2 407:22 411:21  
431:15 450:9  
**meant** 407:22 408:1  
438:19 465:13  
**Mears** 10:4 31:6 87:5  
116:1  
**measure** 360:17 361:8  
361:12 363:15 369:2  
385:10,15,18 387:1  
389:16,18  
**measured** 369:5  
**measurement** 369:19  
386:19 387:4,6  
395:17 397:16 398:4  
398:14  
**measurements** 96:14  
366:20 370:20 371:2  
372:22 408:6  
**measurements'** 373:1  
**measures** 363:7 369:7  
386:22 408:9  
**measuring** 360:16  
**meat** 224:10  
**mechanic** 261:5,9,11  
304:3,9 305:10  
307:12 311:1,2  
330:14 347:15  
**mechanic's** 285:13  
329:16 330:10  
**mechanical** 368:8  
**mechanics** 307:13  
308:13,17,21 309:2  
310:13 311:11 326:17  
326:18,22 328:11,16  
339:8 347:9 348:18  
**mechanism** 110:19  
120:18 139:12,16  
161:12 162:20 165:7  
186:16 210:3,4  
350:11,21 359:2  
380:11 417:13 426:12  
428:7  
**mechanisms** 36:16  
124:13 138:12,13  
140:4 161:9 170:21  
221:22 447:15  
**medical** 181:6 254:4  
324:22 325:1,3 344:1  
344:3  
**medicinal** 179:14  
**meet** 6:15 17:21 19:20  
45:4 74:6 77:7 147:5  
226:5 359:16 361:2  
361:17 362:19,20  
363:2 371:6  
**meeting** 1:7 4:10,13,14  
5:6,21 11:17,19 12:2  
12:6 13:17 14:4,11,15  
14:21 15:15,19,21,22  
16:1,2,12,16,19,20  
17:9 23:11,12 26:3  
59:8 64:1 76:10,13  
78:15 81:2 101:7,17  
103:7 110:13 175:14  
176:12 198:22 199:1  
199:3 200:10 201:12  
202:16 208:10 209:13  
218:12 221:6 226:21  
229:4 231:1 267:5,7  
267:15 268:12 279:16  
280:17,19 294:9  
307:13 309:16 326:18  
388:17 401:19 444:21  
466:16,21 467:19  
468:7,13 469:2 470:3  
471:15 473:22  
**meetings** 15:19 16:5,14  
16:21 17:11 18:3 20:2  
23:16,17,18 27:16  
76:5 79:20 81:12  
100:4,12 202:6  
215:11 340:4 349:16  
408:8 430:15 466:18  
**meets** 267:6  
**member** 1:17,17,18,18  
1:19,19,20,20,21,21  
1:22 2:1,1,2,2,3,3,4  
52:17 53:3,5 125:9  
188:8 275:5  
**members** 5:18 18:7,18  
19:7,8 20:13 52:21  
53:12,22 55:17 73:17  
74:1 88:22 89:1  
198:19 199:7,8  
215:11 217:2 235:16  
270:3 276:13  
**memo** 188:10  
**memorandum** 313:3  
**Memorandums** 65:13  
**memories** 101:18  
**Memphis** 272:8,12,22  
273:10 291:22 335:8  
**men** 409:12  
**mention** 58:12 353:11  
404:7  
**mentioned** 17:13 18:2  
23:6 24:8 51:10 78:14  
97:14 98:4 148:13  
199:4 207:7,13  
208:11 226:6 238:22  
270:3 275:22 302:12  
304:13,16 349:14  
358:9,11,12 361:15  
367:19 379:12 388:8  
403:7,8 408:15 427:4  
427:4 431:14 447:13  
452:5  
**merging** 423:3  
**merits** 163:13  
**message** 277:14  
419:13  
**messages** 300:22  
**messed** 306:9  
**met** 1:12 23:13 213:19  
215:17 361:22  
**meta** 425:17  
**metabolite** 181:5  
**metabolites** 181:7  
**metal** 274:3 315:5  
359:11,15 372:21  
**meters** 363:18  
**method** 129:17 363:20  
374:7  
**methodology** 219:22  
220:2 366:10,11,22  
**methods** 221:2 362:13  
369:8 386:3  
**metrics** 67:18  
**Mexico** 243:2 256:10,14  
324:19 342:22  
**MFL** 438:3,8  
**Miami** 245:9  
**mic** 39:19  
**Michael** 1:17 11:9 40:5  
209:22 227:9 384:14  
398:5 402:3 463:9  
**Michelle** 2:3,9 7:18  
11:11 60:12,13 68:21  
69:19 71:10 150:2,11

151:1 154:14 156:13  
168:11 169:14  
**Michelle's** 163:10  
**Michigan** 8:1  
**microphone** 213:18  
231:19 233:7 235:12  
**microphones** 12:10  
**Microsoft** 226:16 403:9  
412:18 413:19 431:1  
444:22  
**middle** 200:14 273:9  
282:8 327:10,12  
347:12 348:7  
**midnight** 335:8  
**Midwest** 233:4,5  
**Mike** 2:1 10:10 111:4  
166:2 440:18 463:6  
**Mike's** 110:20  
**miles** 381:19  
**military** 234:5,13  
279:11 298:19  
**mill** 385:13  
**Millennials** 284:19,22  
296:14 299:15 300:4  
**million** 107:15 285:6  
452:18  
**millions** 315:16,16  
**mind** 24:7 26:13 29:3  
35:19 44:3 59:22  
83:14 84:16,20 97:1  
102:13,16 126:9  
132:14 133:2 151:13  
157:18 158:20 167:8  
167:19,22 170:6,11  
293:12 339:16 392:7  
401:18  
**minds** 37:6 64:2  
**mine** 67:1 158:2 356:6  
379:1 436:8  
**minimal** 68:6,6  
**minimize** 427:18  
429:15  
**minimum** 42:1 71:15  
110:16 113:10 358:13  
**minor** 128:13  
**minus** 320:6,14 321:18  
388:9,10  
**minute** 29:7 31:3 61:20  
220:9 229:12 232:7  
274:7  
**minutes** 6:4 63:21  
260:11,12 261:6,7  
349:10 402:2 424:10  
436:13 462:16,17  
**minutiae** 20:16  
**mirror** 70:22 294:8  
**missed** 46:4 249:7  
285:22 291:12 293:11

293:11 299:13 330:8  
349:9  
**misses** 30:15 31:22  
36:1 81:19 176:22  
179:9 183:7 186:5  
191:14 203:7 204:3  
**missing** 70:11 158:5  
193:22 293:3 311:5  
464:8 468:15  
**mission** 13:3 24:14  
25:17 29:12 31:9 33:4  
33:22 34:15 76:20  
100:12 102:2 160:6  
201:5 219:6 405:5,15  
405:16  
**missions** 7:12 25:14  
27:2 28:5 234:16  
**misstep** 168:2 346:15  
**mistake** 180:21 238:20  
240:9 241:9,21,21  
242:4,7 244:3 247:22  
252:11 261:8 270:18  
271:3 273:6 275:1  
276:6 283:21 284:2  
300:14 307:12 312:17  
326:9,10,15 327:14  
327:15 340:14 341:2  
341:7,9,19 342:3  
346:20 347:19 348:9  
350:13  
**mistakes** 234:6 239:2  
240:8 241:17 242:9  
248:11,12 260:14  
278:3 318:4 325:6,9  
326:16 346:10 387:5  
**miter** 454:6  
**mitigate** 191:18  
**mitigated** 286:19  
**mitigation** 32:11,14  
82:12 393:7,8,10  
**Mitre** 439:4  
**mix** 69:21 70:16 136:15  
395:3,4  
**Mobil** 254:3 285:1,4,10  
343:1  
**mobile** 5:17  
**Mobilith** 285:11  
**MOC** 56:16  
**mode** 22:18 198:12  
299:16,17 300:19  
302:1,5  
**model** 29:14 53:13 66:2  
66:3,12 84:6 107:5  
151:15,15 163:1  
200:8,12 202:9,14,16  
202:21 203:1,9,17  
204:11 207:6,17,18  
207:21 208:20 209:1

269:6 383:2 406:22  
407:3 416:13 420:16  
421:22 425:2,3 434:2  
454:16  
**modeled** 180:18  
**moderate** 266:7  
**modern** 237:1 320:14  
**modes** 410:14  
**modify** 459:16  
**modules** 219:17 220:20  
**mom** 318:8  
**moment** 79:8 137:9  
185:8 391:5  
**momentum** 38:1 45:16  
**Monday** 179:16  
**monetary** 69:15 473:12  
**money** 111:16 112:1  
222:20 258:6 315:11  
365:17  
**monitor** 368:11  
**monitoring** 294:17  
337:6  
**Montana** 289:3  
**month** 50:19 74:2  
182:13 208:10 225:10  
234:21 235:2 263:18  
266:20 267:3 268:12  
276:6 317:6 340:5  
349:16  
**month's** 242:1  
**monthly** 294:9  
**months** 50:9 61:14,22  
69:20 79:20 154:18  
154:22 158:6,18  
200:9 225:3 337:9,17  
**moot** 38:17  
**Morgan** 2:9 9:11 39:10  
46:7 50:8 74:8 88:20  
94:9 249:10 355:11  
376:12 384:15 389:3  
441:8,11,17 442:4  
443:14,14  
**Morgan's** 355:8  
**morning** 4:3,6 7:5,9,14  
7:18,22 8:3,8 9:14,18  
10:10,15 11:2,8 12:22  
13:18 18:18 113:19  
198:15 207:8 208:11  
211:1 229:19 237:19  
293:10 327:12 335:8  
**morning's** 29:9 30:5  
**motion** 213:22 214:9,21  
214:22 215:8  
**motivations** 228:3  
**motorcycle** 311:4,8  
**MOU** 92:22 93:8 94:13  
128:8 189:11 190:6  
349:4

**mountain** 298:21  
299:12,14,17 300:3  
**mountains** 298:11,14  
**MOUs** 90:3 91:9 189:19  
**mouth** 85:10  
**mouths** 230:11  
**move** 12:22 14:9 18:6  
33:20 48:14 56:1  
84:19 109:22 114:1  
121:4 147:9 176:5  
185:22 205:21 393:20  
408:17 411:14 434:5  
470:14  
**moved** 28:6 251:17  
**moves** 66:2  
**movie** 236:1 404:8,9,11  
404:21 448:16  
**moving** 29:13 43:10  
66:11 181:19 217:6  
414:13 470:7  
**muffling** 142:19  
**multiple** 6:4 57:21  
361:10 421:17  
**municipals** 169:12  
**Murray** 1:13 2:6 4:3,11  
9:14,15 12:17,18  
25:11 26:11 67:10  
72:2 91:18 92:3 98:20  
99:1 103:2,3 108:19  
108:20 127:3,4  
230:15 232:1 402:4  
449:11 468:1,6,20,22  
469:17 470:5 471:14  
473:3  
**Murray's** 163:18  
**nurse** 301:9

---

**N**


---

**NADIAH** 2:11  
**nail** 468:11  
**nailed** 459:12,13  
**name** 4:11 6:20 7:14  
8:8 39:2 137:4 189:13  
189:15 214:2,3 232:5  
252:18,19 263:22  
272:11 273:20 402:14  
432:9  
**name's** 8:17 402:19  
**names** 27:14 253:1  
**Nancy** 2:14 7:9 27:12  
**narrative** 247:6 250:21  
**narrowest** 385:4  
**NASAS** 355:2  
**national** 10:21 313:22  
**native** 408:14  
**natural** 109:19 344:19  
345:4 355:8,12  
378:14 381:19 424:4

- nature** 194:3 408:5  
**naysayers** 143:20  
**NBP** 113:13  
**NDE** 96:6,14 202:4  
 390:1  
**near** 30:15 31:22 36:1  
 81:19 176:6,8,13,22  
 177:2,6,10,21 178:1,2  
 178:8 179:9 182:19  
 183:7 184:21 186:5  
 188:18 189:8 190:10  
 191:14 194:3 203:7  
 251:15  
**near-miss** 219:2  
**necessarily** 5:5 36:8,11  
 43:6 49:3 63:9 86:7  
 100:7 103:13 105:17  
 106:14 128:5 131:16  
 138:7 158:14 174:16  
 272:16 274:21 307:3  
 324:5 341:1 345:1  
 370:18 420:16 428:9  
 431:2 433:10 439:7  
 451:17 455:9  
**necessary** 90:4 91:12  
 99:20 132:1 164:1  
 167:2 173:8 178:13  
 216:4  
**needed** 6:5 19:3 20:15  
 93:17 94:18 101:9  
 104:20 123:18 168:1  
 216:17 459:17  
**needing** 72:21 73:2  
 106:15 161:19 466:12  
**needs** 37:19 42:18  
 46:22 47:20 51:1 83:9  
 87:19 109:14 126:2,6  
 132:18 143:5 168:10  
 186:12,15 191:7  
 227:21 259:18 376:3  
 392:21 397:19,21  
 432:21 436:11 440:3  
 452:14 455:6 458:9  
 461:10 468:16  
**negative** 121:7  
**negatively** 159:14  
**negligent** 65:2  
**negotiations** 229:18  
 230:6  
**neither** 91:13 114:21  
 133:12  
**net** 97:10  
**network** 70:2 425:7  
**never** 30:19,19 66:22  
 88:1 95:3 129:4 169:1  
 174:17,17 178:7  
 248:20 287:1 310:13  
 321:2 348:5 373:4  
 395:8,9 424:1 427:20  
 436:20 443:13,15,16  
 443:20 461:14  
**new** 9:19 21:12 31:12  
 40:19 64:5 95:16  
 106:7 120:14,19  
 181:8 229:16 236:6  
 241:22 243:22 244:2  
 245:11 250:9 261:19  
 284:15,15,18 285:8  
 285:11 290:20 296:16  
 296:17 301:15 316:18  
 320:18 322:2,2 337:2  
 339:5,21 357:3 362:9  
 374:18 382:13,14  
 396:15,19,19 398:13  
 415:13 470:10  
**news** 279:21  
**newsletter** 317:5  
**NGOs** 206:13  
**NGUYEN** 2:10 288:15  
 314:4,8  
**nice** 196:7 351:19 414:1  
**nicely** 100:14 109:15  
 110:1  
**nickel** 365:21  
**night** 272:15 282:8  
 298:3,4 299:2  
**nighttime** 246:21  
 297:22 299:15,17,19  
 300:19  
**Ninety** 29:2  
**NiSource** 8:11,14  
**no-no** 307:21  
**no-sequel** 425:3  
**nobody's** 262:5 279:20  
 302:9  
**node** 431:16  
**nodes** 431:17  
**noise** 247:19 250:4  
**non-** 271:12 409:3  
 430:8  
**non-disclosure** 128:22  
**non-disconnect** 99:21  
**non-discretionary**  
 188:1  
**non-enforcement**  
 69:16  
**non-punitive** 35:13  
 61:1 270:5 338:17  
**non-sole** 305:2  
**noon** 13:5  
**norm** 261:22  
**normal** 16:15 21:22  
 95:11 120:10 237:3  
 434:2 441:6  
**normalization** 383:4,18  
 398:1 423:12 452:6  
**normalize** 384:2  
**normally** 135:18 178:7  
 345:17  
**nose** 112:6  
**NoSQL** 427:8  
**Notation** 417:9  
**note** 12:8 20:12 81:20  
 102:20 251:22 297:19  
**notes** 471:2  
**notice** 16:5 21:22 22:5  
 69:14 119:18,22  
 252:1 296:3 299:20  
 302:13 322:1 378:15  
 400:7  
**noticed** 250:9 311:5  
**notification** 166:5,9  
 300:16  
**notifications** 400:7  
**notify** 149:20 286:11  
 301:3  
**notion** 117:4 384:19  
 387:18 463:13  
**notwithstanding**  
 133:18 137:10 139:19  
**November** 8:11 16:1  
**nowadays** 244:5 370:5  
 372:9  
**NPMS** 447:18  
**NTSB** 231:5  
**NTSB/FAA** 89:3  
**nuance** 93:13  
**nuclear** 241:4,6,10,14  
 241:16,20 242:10  
**nulling** 443:8 444:12  
**number** 12:2 23:15  
 27:17 29:15 44:13  
 49:13 58:7 81:7,22  
 169:4 233:19 234:18  
 281:18 297:7 333:3  
 354:22 360:20 361:5  
 363:5 370:9 371:10  
 371:19 389:13,14  
 435:9 437:22 438:2  
 441:7  
**numbers** 15:7 213:21  
 334:15 412:8  
**nuts** 59:15  


---

**O**

---

**obfuscation** 419:19  
 440:12,13 441:5  
**object** 136:5  
**Objection** 417:9  
**objective** 4:17 24:7,15  
 357:20 470:3  
**objectives** 7:12 13:3  
 25:15,17 27:2 28:9  
 359:8 360:19 361:3  
 374:5  
**objects** 405:21  
**obligated** 66:9  
**obligation** 117:7 134:15  
 170:4  
**obligations** 94:12  
**observation** 26:10  
 404:21  
**observations** 206:11  
 391:4  
**observe** 324:20  
**observed** 254:1  
**obtained** 121:18 143:7  
 390:7  
**obvious** 140:2 298:12  
 329:10,10 414:21  
 441:12  
**obviously** 27:11 28:5  
 35:12,16 41:22 54:3  
 54:13 66:9 69:1 83:18  
 93:15 112:15 118:11  
 124:4,8 174:13  
 191:19 319:2 442:8  
 443:21 444:3,22  
 445:18  
**occupational** 10:7  
 59:12  
**occur** 40:9 84:15  
 125:19  
**occurred** 171:21  
 433:11  
**occurrence** 465:8  
**occurrences** 174:18  
**occurring** 203:12  
**occurs** 205:2  
**October** 17:15  
**off-shooting** 403:4  
**offense** 284:22 287:6  
**offensive** 143:16  
**offer** 36:16 160:8  
 191:11 217:10 342:18  
**offered** 216:2  
**offering** 413:15  
**office** 7:11,15 8:5 9:22  
 223:8,11 229:20,22  
**officer** 8:4 246:17  
 247:12 251:2 260:2  
 273:2  
**Officer's** 272:21  
**officers** 313:19  
**offices** 330:20 332:19  
**official** 1:13 2:7 4:12  
 9:16 19:18 27:13  
 73:18 383:2 405:5  
**offline** 107:12  
**offshore** 85:5 202:21  
 209:1 342:13  
**oftentimes** 361:4 372:9

400:15  
**oil** 48:17 243:4 256:9  
 324:18 342:13,13  
 343:16 435:8  
**old** 17:5 242:18 260:11  
 284:9,14,16 300:3  
 374:16 416:9  
**old-** 387:1  
**older** 293:6 296:15  
 362:7  
**onboard** 243:5 282:9  
**once** 38:1 68:1 81:4  
 86:1 222:6 229:15  
 267:6 268:10,12  
 274:16 278:8 333:11  
 349:16 390:6 428:15  
 429:15 431:9  
**one-inch** 385:14,14  
**one-off** 262:19,20  
**one-sided** 200:6  
**one-to-one** 385:11  
**ones** 30:18 63:4 83:18  
 169:6 280:8 301:2  
 307:18 320:18 388:4  
 388:18 470:1  
**ongoing** 78:3 99:21  
 151:9 185:12  
**online** 443:5  
**oops** 446:3  
**op-ex** 413:6  
**open** 1:7 4:7 6:2 16:16  
 24:7 43:7 63:17 74:14  
 156:13 159:12 167:4  
 206:4 209:21 214:8  
 304:22 317:8 373:9  
 418:10  
**Opening** 3:6  
**operate** 90:5 91:13  
**operating** 18:12 326:2  
 360:1 361:21 415:9  
**operation** 335:14  
**operational** 222:9  
 330:22 348:22 365:22  
**operationalize** 28:21  
**operationalized** 117:3  
**operationalizing**  
 117:14  
**operationally** 118:10  
**operations** 10:16 11:5  
 67:7 235:6 294:15  
**operator** 41:3 42:7 44:9  
 50:17 61:6 62:10,11  
 63:6 67:11 74:4 91:15  
 117:8 133:16 135:19  
 137:4 152:9 154:20  
 157:19 164:22 176:17  
 176:21 191:6 193:7  
 203:8 204:10 211:19

214:8 218:18 255:7  
 354:9 356:9 359:22  
 360:22 361:1,16  
 365:2 368:6 381:8  
 399:2,8 438:13  
 444:10  
**operator's** 366:19  
 394:18  
**operators** 31:1 37:10  
 38:13 41:2,4,9 44:11  
 46:17 47:8 57:14,22  
 61:20 62:22 70:1  
 84:11,19 87:20 89:9  
 90:11 91:10 92:10  
 93:5 94:1 96:5,22  
 97:5,9 113:14,20  
 141:14 146:21 148:14  
 149:15 157:14 158:10  
 159:1,21 164:12  
 168:15 170:16 173:22  
 174:4,7,11 176:8  
 194:12 210:11 211:13  
 212:2 321:11,17  
 356:11 357:14 376:5  
 378:17,20 380:1  
 381:17 399:11,13,22  
 400:8 432:20 440:1  
 456:15  
**operators/inline** 91:1  
**opinion** 49:4 152:18  
 411:8  
**opinions** 383:2  
**opportunities** 5:20  
 49:22 82:10 85:8  
 170:18 171:4,9 204:3  
 226:7 378:22 385:6  
 386:13 387:5 388:6  
 398:19,20 400:10  
**opportunity** 40:12 57:3  
 109:13 206:5 352:11  
 376:21 382:7 400:17  
 431:13 436:3  
**opposed** 33:3 37:5 88:5  
 129:3,9 151:14  
 206:15 215:7  
**opposite** 49:15  
**ops** 280:22 281:6 282:1  
 309:21 329:11 331:22  
 339:5,6  
**optics** 141:14  
**option** 15:6,14 43:6  
 164:10 179:6 380:3  
 441:16  
**options** 13:9 15:2 108:6  
 190:17  
**order** 11:19 15:7 46:15  
 48:9 95:4 109:20  
 115:4 148:20 170:19

193:9 197:5 285:8  
 362:5 371:10,18  
 372:10 375:18 395:5  
**Order/Open** 3:4  
**ordered** 197:10,12  
**ordering** 15:10 195:12  
 197:8,11,15  
**organization** 28:10,18  
 28:22 192:16 261:22  
 346:8 429:2 435:11  
 439:2 446:2  
**organizational** 29:14  
 37:9  
**organizations** 39:9  
 411:13 414:3  
**organize** 19:5 425:12  
**organized** 19:2  
**oriented** 202:19 339:9  
**originally** 336:10  
**OSHA** 183:10,16  
 256:13 344:2  
**ought** 217:9 220:7  
 221:10,13 222:1  
**outage** 298:20,22  
**outcome** 30:21 32:14  
 33:5 84:22 356:13,17  
 390:17,18 428:20  
 433:16,19 434:1  
 454:15  
**outcomes** 34:4,11  
 82:16 109:21 390:15  
 392:14 428:11  
**outlier** 387:19  
**outliers** 388:4 461:14  
**outline** 21:3 30:7 78:14  
 201:16 208:8,9  
 358:18  
**outlines** 28:15 77:6  
**outlining** 159:7  
**output** 218:10,11  
**outreach** 8:18  
**outs** 3:9 18:7 24:5,10  
 24:14  
**outset** 78:16 90:8,16  
 92:17  
**outside** 64:10 65:3  
 122:5 125:20 138:14  
 138:15 163:5,12  
 170:10 176:3 206:12  
 227:15 254:12 320:19  
 364:16 367:7 388:19  
 393:21 397:6 399:18  
 465:15  
**outsource** 265:16,19  
 266:2  
**outsourcing** 258:4  
**outstanding** 27:3 75:9  
**over-call** 386:7,8

**over-wing** 282:10  
**overall** 4:17 21:1 23:6  
 28:18 35:5 54:3  
 173:18 339:18  
**overcome** 35:21 37:14  
 40:13 45:14 89:16  
 94:22 208:1  
**overgrown** 248:2  
**overhead** 297:22  
**overlap** 76:15 77:1,10  
 199:12,13 207:8  
 378:4  
**overlapping** 76:8  
**overlaps** 207:9 226:4,6  
**overlay** 372:11  
**overly** 42:5  
**oversight** 41:20 51:11  
 51:14  
**overspeeds** 294:2  
**overthink** 111:11  
**overturn** 473:5  
**overview** 24:18 224:13  
 227:20 469:11  
**overwhelmed** 81:6  
**ownership** 43:15,16  
 44:6 52:18  
**owns** 256:13

---

**P**


---

**P-H-M-S-A** 6:6  
**P-R-O-C-E-E-D-I-N-G-S**  
 4:1  
**p.m** 198:2,3 224:2,3  
 352:3,4 474:13  
**paced** 462:4  
**pack** 45:18 285:2  
**package** 417:16  
**page** 16:7 17:8 373:16  
**pages** 15:20  
**paid** 231:12 315:8  
**painful** 107:14,14  
**paint** 248:2  
**palpable** 176:8  
**panel** 310:16,17  
**paper** 56:15 289:22  
 293:6 460:16  
**papers** 209:14  
**paperwork** 287:2  
**paradigm** 41:18 43:1  
 51:20 56:11 59:20  
 95:15,16 411:9 419:6  
 424:16  
**paradigms** 428:13  
 464:16  
**paragraph** 91:19 94:13  
 94:15 177:14 188:6  
**parallel** 109:15 412:2  
 412:11

- parallels** 74:22  
**paraphrasing** 4:21  
**parent** 14:9 19:1,1,10  
 19:13,15 20:9 21:2,13  
 21:15 22:12 23:5 24:6  
 468:2  
**Parker's** 48:7  
**parking** 6:16  
**parse** 406:2  
**part** 18:20 39:7 40:14  
 40:18,22 41:8 50:22  
 57:17 65:15,17,19  
 69:4 71:12 72:14  
 84:11 89:15 92:6 96:7  
 105:11 106:8 125:22  
 126:1 136:18 140:9  
 162:2 163:4 164:6  
 167:6 177:10 180:14  
 180:21 183:18 186:6  
 191:17 192:6 193:5,7  
 194:16 209:4 212:2  
 239:15 269:11,14  
 278:16 279:3 280:6  
 281:22 286:16 287:11  
 295:1 317:1 329:18  
 331:14 334:6 336:11  
 340:9 343:22 350:5  
 351:10 353:4 354:17  
 368:3 374:1,2 375:15  
 377:2 378:14 379:19  
 382:1 387:8 388:8  
 398:11 403:6 409:14  
 417:4 424:4 426:15  
 426:21 440:6 444:18  
 452:4 455:14 460:9  
 460:22 461:8 462:5  
**part's** 343:22  
**participant** 100:21  
 101:4 173:4,14  
 185:12 197:2,6,9  
 279:4 283:21 336:3  
**participants** 92:11  
 114:6,17 219:18  
 220:1  
**participate** 5:21 35:8  
 47:9 48:19 53:12  
 113:20 119:19 194:14  
 217:9  
**participated** 211:20  
**participating** 20:20  
 212:3,5 215:12 380:2  
**participation** 27:15  
 30:11,14 48:10 52:17  
 53:4,6,7 90:15,16  
 91:14 114:5 115:3,16  
 121:6 148:7 149:18  
 164:8 198:14 199:8  
 205:6 206:15 208:1  
 228:6  
**participatory** 14:10  
**particular** 42:15 83:15  
 100:18 105:22 114:1  
 121:17 134:3 137:22  
 137:22 142:13 147:18  
 164:13 202:10 356:4  
 364:20 376:1 391:17  
 393:6 456:4,10  
**particularly** 26:5 27:16  
 30:16 40:17 77:19  
 83:18 84:21 241:9  
 312:9 328:2  
**parties** 93:5 122:6  
 133:5 257:4 361:21  
**partisan** 111:20  
**partner** 256:18  
**partnered** 238:15  
**partners** 10:17 39:10  
 144:15 287:15  
**parts** 21:19 342:12  
 406:12 410:13 411:1  
 457:1  
**party** 68:16 91:10  
 100:22 117:6 118:11  
 118:17,17 277:20  
**pass** 24:15 63:18 120:8  
 152:22 153:14 154:19  
 155:3 201:2 361:7  
**passed** 315:13 419:20  
 420:3  
**passenger** 107:4  
 246:22 315:13,15,19  
**passengers** 282:8  
 317:22  
**passes** 171:11  
**passing** 204:20 360:12  
**patently** 450:21  
**path** 6:14  
**pathway** 66:21 131:14  
**patience** 469:6  
**pattern** 240:11 271:16  
 415:19  
**patterns** 422:16  
**Paul** 2:11 351:18  
**pause** 31:3 220:9  
 430:10  
**pawn** 179:22  
**pay** 93:12 258:1 265:17  
 308:7 315:7 429:13  
**payment** 197:16  
**peak** 298:12  
**Pearen** 2:2 48:5,5 78:6  
 142:16,16,20,22  
 144:3,7 171:17,18,20  
 187:5,6  
**peculiarity** 105:7  
**peers** 53:6  
**penalties** 149:2 176:10  
 350:20  
**penalty** 69:9 152:20  
 166:7  
**penny** 427:20  
**people's** 161:22  
**people/process** 109:5  
**perceive** 151:7  
**perceived** 125:6  
**percent** 29:2,4 70:2,3  
 150:14 154:1,2 158:2  
 174:11 248:21 249:13  
 258:11 286:1 384:4  
 392:9 416:7 458:11  
 458:12,15,19 460:1  
**percentage** 70:8 388:13  
 388:19  
**perfect** 243:8 269:20  
 331:12 358:9 385:10  
**perfectly** 151:17 385:11  
 465:22  
**perform** 216:13  
**performance** 208:4  
 228:6 319:22 320:1  
 354:5,7,18 361:14,18  
 362:12,18,22 363:14  
 364:3,19 366:8,12  
 367:7 370:21 371:2  
 373:2 374:2 380:3  
 387:22 388:8 397:4,7  
 397:19 399:1  
**performance-based**  
 152:12 357:6,18  
**period** 86:6 158:11  
 190:13  
**permitted** 133:19  
 137:11  
**permitting** 138:1  
**person** 13:22 49:5,6,16  
 114:22 197:18 209:13  
 214:18 241:22 253:8  
 256:22 259:18 275:8  
 277:9 336:8 349:3  
 387:4 398:8 406:4  
**person's** 69:15 85:10  
**personal** 114:8  
**personally** 124:3 164:2  
 284:7 440:17 441:2  
 443:11,18 470:17  
 471:8 473:13  
**personnel** 204:10 357:7  
 357:11 358:15 377:17  
**persons** 91:12  
**perspective** 43:13  
 46:10 54:17 64:18  
 117:2 131:6 223:5  
 227:15 228:4  
**perspectives** 211:16  
**persuade** 217:8  
**petabytes** 428:3  
**Pete** 2:13 402:21  
 403:22 405:17 426:19  
 427:4 428:13 430:1  
 445:6,10 447:13  
**petroleum** 242:17  
 243:9 318:12,13  
**Ph.D** 1:20 2:6,8  
**phase** 113:16 164:4  
 222:8,20 434:17  
**phased** 109:1 110:9  
 398:10  
**phases** 110:6 449:16  
**phasing** 163:18 164:6  
 222:4  
**philosophical** 152:2  
**philosophy** 30:2 291:13  
 339:20  
**PHMSA's** 7:15 46:7  
 47:3 134:15 154:14  
 430:7  
**PHMSA-2016-0136**  
 12:3  
**phone** 4:5,5 11:16  
 13:18 23:17 28:2 48:4  
 48:6 55:18 78:4 88:8  
 103:2 111:8 121:3  
 142:14,18 171:18  
 194:21 212:14 228:17  
 230:22 247:1 275:8  
 277:15 332:20 337:17  
 343:11 353:7 355:18  
 415:14  
**phonetic** 113:13 171:3  
 288:13  
**phrase** 97:1  
**physically** 39:11  
**physics** 364:7 396:17  
**pick** 262:20 343:11  
 462:3  
**picked** 262:18 301:20  
**picking** 64:8 210:17  
 443:14  
**picks** 462:10,11  
**picture** 60:7 250:20,22  
 251:3,3 319:1 327:11  
 409:11 445:19  
**pictures** 235:8 250:18  
 281:19  
**piece** 66:4 128:1 132:8  
 143:9 193:21 227:14  
 258:4 265:16 279:1  
 336:17 347:22 369:13  
 392:16 431:8  
**pieces** 46:14,14 413:1  
 449:18  
**pig** 361:7

- Pigs** 42:12  
**PII** 440:17  
**Pike** 1:13  
**pillars** 336:12  
**pilot** 89:3 188:8 234:14  
 237:17 238:21 239:18  
 246:8,15 251:18  
 263:9 267:12,13,14  
 270:17 272:17 275:21  
 275:22 276:6 305:10  
 308:20 309:19 310:11  
 328:21 329:13,19  
 330:5,14 339:13,14  
**pilot's** 273:6  
**pilots** 216:17 235:17,18  
 236:8 245:21 247:13  
 249:14,18 271:21  
 276:14 277:3 278:13  
 295:17 296:20 297:8  
 297:15 299:18 300:17  
 301:7 306:3 310:11  
 310:15 313:15 315:7  
 317:12 321:19 329:14  
 331:9 332:8 333:8  
 348:18,20,21  
**pipe** 2:12 70:3,4 243:15  
 372:11 459:3  
**pipe's** 393:18  
**pipelines** 48:17 60:4  
 91:7 135:7 223:11  
 357:10 381:20,22  
 456:16 458:14  
**pipes** 4:16 456:16  
**pit** 386:21  
**Pivot** 403:1,5  
**pizza** 197:13,15 223:14  
 223:19 229:12,14  
 230:2,3,6 231:11,16  
 258:1 307:14 342:9  
 345:22 352:8  
**pizza's** 231:14  
**pizzas** 197:8  
**place** 19:4 22:16 56:1  
 64:18 65:7 73:3 83:1  
 109:13 127:10 158:18  
 170:1 177:20 183:9  
 183:11 186:17 189:20  
 189:22 191:18 200:3  
 201:8 220:17 282:4  
 284:4,7 319:18  
 325:15 336:21 378:9  
 382:11 391:2 446:1  
 463:20 464:14  
**places** 76:22 80:9  
 130:14 181:4 228:12  
 313:15,18 316:7  
**plagiarism** 219:15  
**plagiarize** 219:13
- plain** 26:21  
**Plains** 7:3  
**plan** 112:19 116:10  
 467:12  
**plane** 290:5 296:1  
**planes** 237:5,10  
**planning** 8:5 358:20  
 467:14,15,16,17  
**plans** 36:18,19  
**plants** 241:6  
**plasticized** 261:20  
**plate** 273:19 297:20  
**platform** 86:14 87:4  
 203:14  
**play** 37:10 39:11 42:15  
 46:22 76:1 127:17  
 172:12 213:22 335:19  
 345:9,14 419:19  
**player** 39:7  
**players** 39:16 59:11  
 65:14 73:1 126:19  
 413:14  
**playing** 223:1 452:7  
**playoffs** 251:12  
**plea** 460:19  
**please** 5:17 16:12 26:12  
 28:1 31:5 44:6 73:17  
 123:2 215:5 251:15  
 460:1  
**plenty** 49:22  
**plot** 384:20 385:17  
 386:1,4 395:14  
 397:11 423:20  
**plots** 423:22  
**plus** 111:18 388:9,10  
**plusses** 49:19  
**PO** 355:2  
**Pods** 420:11 422:18  
 445:6 447:18  
**point's** 194:8  
**pointed** 80:18 93:16  
 408:12  
**pointing** 77:10,12  
**points** 25:14,15,21  
 37:14 40:1 42:4,5  
 43:10 45:14 57:8  
 58:20 71:22 72:3  
 124:4 136:11 178:16  
 180:13 182:1 217:11  
 217:16 356:7 371:10  
 386:10 388:13 408:2  
 456:12  
**poker** 386:22  
**polarized** 310:6,8,12  
 311:6,17  
**police** 244:17 246:13  
 246:17 247:11,16,21  
 313:18,19
- policies** 245:6 316:8  
**policy** 7:10 111:19  
 242:5 259:14,16  
 326:21 337:3 350:6  
 473:2  
**political** 111:19 463:4  
**politically** 449:7  
**politics** 92:16  
**poll** 211:12  
**polling** 211:2  
**pool** 15:12  
**pooled** 66:18  
**poor** 33:14  
**poorly** 326:15  
**pop-up** 266:19  
**popular** 17:2  
**population** 223:6  
 258:11  
**Port-au-Prince** 252:7  
**portions** 415:10  
**portrayed** 200:16  
**position** 43:22 102:19  
 181:14 259:12  
**positively** 410:1  
**possibilities** 204:4  
**possibility** 191:1  
 221:21  
**possible** 39:11 92:7  
 164:9 391:16 424:1  
 474:9  
**possibly** 40:4 81:19  
 82:7 410:2 423:3  
**post** 272:18  
**post-inspection** 369:14  
**posted** 15:22 20:18  
 140:14  
**posters** 323:17,21  
**potent** 413:20  
**potential** 43:18 77:1  
 112:17 121:6,7 133:7  
 133:8 139:2 151:11  
 239:8,9 242:15 269:7  
 302:16 337:5 354:4  
 366:16 389:17 458:18  
**potentially** 83:19 99:16  
 160:21 269:18 340:12  
 389:20 432:11,13  
 467:13  
**potentials** 403:14  
**pounds** 297:1,2,4,5  
**power** 47:11 140:5  
 148:1 241:6 253:17  
 298:20,22 404:15  
 412:1 413:9 429:1,7  
 448:22  
**powerful** 345:19 463:14  
**PowerPoint** 407:5  
**powers** 120:10 146:2
- 147:1  
**practice** 151:6 186:8  
 198:11 202:1 207:17  
 211:17  
**practices** 10:18 56:3  
 75:15 76:17 77:2,12  
 77:14 173:2,4 186:21  
 195:4,8 198:6 199:20  
 199:21 200:22 203:11  
 205:11 207:11 208:12  
 208:15,17 441:6  
**PRCI** 44:14 75:16,22  
 199:5 202:4,10  
**pre-inspection** 367:17  
 368:1,3  
**pre-judge** 111:15  
**pre-Kindergarten** 234:3  
**pre-positioned** 282:3  
**preach** 346:2  
**preaching** 261:12  
**precedent** 144:22  
**precisely** 38:11 369:2  
**precision** 398:16  
**predict** 433:21  
**predictive** 434:1,4  
**prefer** 338:15 341:12  
**preflight** 281:11 317:5  
**premier** 459:7  
**premise** 30:8  
**prep** 196:4  
**preparation** 208:10  
**Preparatory** 3:17  
**prepare** 216:11  
**prepping** 14:11  
**prescribed** 219:6  
**present** 1:15 2:5 19:19  
 75:4 86:8 138:6  
 424:11 432:12 445:15  
 446:18  
**presentation** 17:11  
 20:17 30:5 74:20 75:2  
 75:9 117:19,20 175:6  
 191:21 201:20 212:22  
 224:9,10 225:22  
 226:17 232:12 263:4  
 319:5,6 323:9 324:11  
 349:10 353:6,10  
 355:17 358:12 367:10  
 379:7 390:13 394:11  
 407:3 410:19 411:3  
 417:20,21 449:12  
 452:10 456:1 460:2  
 463:11  
**presentations** 11:21  
 74:16 195:19 225:11  
 468:11  
**presented** 74:6,17  
 103:9 202:5,15,22

225:14  
**presenters** 467:8  
**presenting** 421:11  
**presently** 355:19  
**preserve** 217:2  
**president** 8:12 9:10  
 10:4,16  
**president's** 112:11  
**presidential** 112:11  
**presiding** 1:14 4:12  
**press** 123:14  
**pressed** 446:4  
**pressure** 92:5 243:11  
 260:3 360:2  
**prestigious** 319:18  
**presumed** 164:16  
**presumptuous** 17:18  
**pretty** 17:2,20 28:7,13  
 28:20 29:3,3 58:21  
 59:4 70:18 101:7  
 117:13 178:21 199:22  
 212:16 290:5 292:15  
 298:12 307:16 308:4  
 308:16 311:21 324:21  
 327:22 332:17 335:6  
 341:16 343:2 383:9  
 384:4 390:5 394:14  
 427:20  
**prevent** 41:6 84:19  
 122:13 191:3 238:3  
 240:21 272:4 360:16  
 376:9  
**prevented** 106:12  
 176:16 325:7  
**preventing** 32:7  
**prevention** 66:10  
**preventive** 36:18 151:8  
**prevents** 41:13  
**previous** 15:22 16:5  
 187:3 215:10  
**previously** 183:20  
**primarily** 94:15 217:1  
 226:21 230:20 338:1  
**primary** 114:16 214:5  
 226:13  
**Principal** 402:22  
**principle** 337:20  
**prior** 74:7 78:15 166:6,9  
 201:12 220:12 221:3  
 338:11 370:16 392:18  
 416:6 419:21  
**prioritize** 192:4  
**privacy** 410:22 419:18  
 432:16 437:10,10  
 440:11  
**privacy-** 306:7  
**private** 46:14 49:2  
 347:20 440:22

**Privilege** 166:4  
**privileged** 149:10  
**privy** 141:14  
**proactive** 32:5 36:18  
 151:2,8  
**probability** 364:22  
 366:20,21  
**probably** 36:7 44:15  
 76:11 93:7 116:15  
 127:7,18 135:19  
 172:16 175:13 180:9  
 180:9 183:16,18  
 189:1 206:3 211:8,12  
 237:12 241:8 242:2  
 245:9 274:3 285:18  
 296:20 310:21 327:9  
 327:13 329:4,10  
 333:22 334:4 341:8  
 345:21 348:19 371:12  
 382:19 408:18 409:22  
 413:21 423:16 426:6  
 453:1 464:20 470:14  
**problem** 61:7 185:1  
 248:13 257:16 344:4  
 350:18 409:20 412:4  
 416:11 429:12 441:12  
 442:12 443:21 449:8  
 454:18 455:14 471:19  
**problems** 58:22 59:3  
 151:12 404:13 434:21  
**procedure** 242:5  
 244:18 259:14 262:4  
 262:5 300:2 301:20  
 302:22 326:21 337:3  
 337:10  
**procedures** 61:17  
 245:7 316:8 355:9  
 357:7 365:3 377:3  
 473:21  
**proceedings** 406:15  
**process** 8:6 9:3 25:7  
 39:13 40:7 42:4 43:17  
 47:21 49:8 56:16 57:1  
 57:18 67:16 73:11  
 76:16 77:2,11 84:15  
 86:16 87:12 99:6  
 102:22 105:8,13  
 106:2 107:8,14,17  
 109:16,20 110:18  
 119:15,20 125:17  
 127:11 136:7 146:8  
 155:8 161:1 164:7  
 172:2,10 173:1  
 178:12 183:10 185:1  
 185:12 186:8,20  
 195:4 199:12 201:1  
 205:12 207:2 208:11  
 209:16 216:10,21

218:8 220:15 221:13  
 226:5 227:2 278:8  
 287:11 291:21 292:7  
 328:8,9 329:15  
 331:10 333:1 336:21  
 337:4 344:12 353:3,6  
 354:2 355:8 356:14  
 370:9 371:21 373:11  
 376:22 380:5 382:11  
 382:14 389:1 396:9  
 397:19 403:22 407:1  
 411:1 428:18 431:17  
 445:20 449:15 464:8  
**processed** 94:21 202:8  
 220:12 432:18  
**processes** 64:18 65:6  
 78:21 89:6 95:11  
 99:21 112:12,13  
 124:19 125:13,18  
 142:2 160:16 205:16  
 354:3 357:15,20  
 365:12 376:1,18  
 379:1 382:10 393:6,8  
 393:9 400:4 412:2  
 440:15 451:13  
**processing** 31:20 213:2  
 404:14 412:3 418:3  
 429:16 431:6 446:8  
 447:6 448:2,22  
**processors** 411:22  
**produce** 38:5,18 60:8  
 149:15 181:6 217:19  
 460:16  
**produced** 11:20 148:22  
**producing** 30:1  
**product** 26:16 110:16  
 297:18 360:7 368:14  
**products** 113:10 356:3  
**professional** 237:16  
 440:16  
**professionals** 27:8  
 216:18 237:18,21  
**professor** 8:1  
**proficiency** 340:21  
**profiles** 398:14  
**program's** 324:12  
**programmatic** 49:11  
**programming** 249:15  
 416:17 437:9  
**programs** 7:10 62:17  
 94:18 116:13 166:19  
 184:22 185:6 188:9  
 188:13,16 189:8,9,9  
 189:12,13,17 190:10  
 190:10 193:3 254:21  
 263:11 268:16 279:13  
 295:2 329:21 332:15  
 333:5 337:22 344:20

349:1 384:17 396:13  
**progress** 22:14 368:12  
**progresses** 37:16  
**progressing** 54:2 208:6  
**prohibited** 177:22  
**prohibition** 119:3  
 128:10 133:18 134:14  
 137:10 148:6  
**prohibitions** 181:1  
**project** 12:11 194:15  
 202:4,10 215:13  
 392:19  
**projects** 107:21  
**promise** 169:20  
**promote** 217:11  
**promoted** 345:2  
**promotes** 339:1  
**promotion** 278:17  
 316:22 317:13 327:20  
**promulgate** 90:20  
 114:20 120:11 121:13  
 132:9 133:12 148:19  
**promulgating** 119:17  
 127:11  
**promulgation** 116:2  
**proper** 148:7 375:18  
**properly** 114:13 290:6  
 295:7 389:9,10,12  
**property** 42:17 83:20  
**proposal** 75:17 147:18  
**proposed** 91:17 378:13  
 378:15  
**proposing** 214:2  
**proprietary** 114:10  
 115:8 408:13  
**prosecuted** 149:22  
**prosecution** 177:1  
**prospect** 344:17  
**protect** 134:16 191:8  
 192:19 217:1 433:5  
**protected** 114:8 123:3  
 149:10 178:3 186:12  
 275:19  
**protecting** 147:14,21  
**protection** 11:13 67:9  
 115:7 121:9 164:15  
 172:18 178:22 179:4  
 180:15 193:6 328:3  
 372:13,19 389:17  
 394:1  
**protections** 50:12  
 115:15 179:2 180:18  
 183:10 186:16 305:14  
**protective** 137:19  
**protects** 123:22  
**protocol** 314:5  
**protocols** 410:11 474:4  
**prove** 50:1



**prove-up** 371:4  
**proven** 340:20  
**provide** 4:22 18:9 20:14  
 24:4 25:22 38:6 87:13  
 103:15 104:19 118:14  
 119:19 146:19 174:4  
 356:16 357:14 361:11  
 388:6 412:7 414:6  
 469:11  
**provided** 5:6 20:17  
 24:18 53:18 60:8  
 115:2,9 129:8 133:17  
 203:9 473:11  
**provider** 211:20 354:10  
 356:8 360:22 366:9  
 366:10  
**provider's** 365:3  
**providers** 96:6 211:13  
 356:11 357:14 365:10  
 389:5 414:16 439:9  
**providers'** 365:8  
**provides** 146:7 202:17  
 354:19,20 356:10  
 357:5,19  
**providing** 30:14 108:6  
 114:21 121:13 133:12  
 172:12 174:8,12  
 176:21 354:11,12  
 439:21 451:22 452:16  
**provision** 95:19 125:10  
 146:7,10 147:22  
 172:5  
**provisions** 121:14  
 125:2 128:3 172:8  
 191:18  
**PSMS** 214:7 219:14  
**PSTs** 206:13  
**pub** 425:5  
**public** 5:18,20 9:19  
 11:13 16:14,17 20:21  
 44:20 64:5 82:3 83:4  
 87:20 103:11,12,14  
 104:5 106:7 119:17  
 119:18 120:1 128:21  
 129:12,13 133:21  
 134:16,20 135:9  
 137:14 139:2,3 140:3  
 140:11 141:3,3  
 173:15 177:20 206:6  
 206:13 207:3 227:13  
 227:15 287:20,22  
 322:22 323:1,12  
 324:6 325:13 326:6  
 340:19 349:17 432:20  
 439:10,21  
**publication** 115:11  
 129:22  
**publicity** 83:19

**publicize** 178:13  
**publish** 42:1  
**publishing** 221:4  
**PUGH** 342:10  
**pull** 73:12 188:10 189:1  
 190:16 236:12 246:14  
 299:4 334:8 407:4  
 412:22 419:6,16  
**pulled** 353:10  
**pump** 445:8  
**pumps** 295:21  
**punch-line** 448:16  
**punitive** 35:15 46:19  
 51:5 52:2 54:9 133:8  
 133:15 165:2 271:13  
**punitively** 191:2  
**purpose** 4:13 29:8 30:5  
 30:20 31:15 35:6  
 76:14 91:2,5 122:16  
 160:15 161:2 244:9  
 353:17  
**purposely** 177:20  
**purposes** 32:18 161:13  
 161:20 399:19 442:2  
 467:17  
**purse** 301:8,11  
**purview** 142:8  
**put** 18:11 33:17 34:7  
 35:18 38:13 53:10  
 73:3 85:9 116:14  
 120:5 123:2,11  
 137:18 184:7 211:17  
 218:1 227:4 245:17  
 250:9 251:12,14  
 256:2 261:20 264:9  
 270:10 282:12,15  
 284:6,7 297:9 300:16  
 301:9 316:2 317:5,8,9  
 317:20 320:14,19  
 321:2 322:4 323:17  
 324:3 328:7 332:18  
 341:19 347:12 365:14  
 368:17 405:13 407:16  
 419:5 422:6 423:14  
 428:7,10 446:1  
 447:20 451:1 454:10  
 458:3,15 459:15  
 469:20  
**puts** 190:12 251:22  
 284:4 317:13  
**putting** 116:10 137:21  
 186:20 204:14 209:14  
 227:19 250:22 316:8  
 422:13 459:9 465:16

---

**Q**


---

**QA/QC** 205:4 207:19  
 221:3

**QA/QC'd** 202:8  
**quadrant** 421:6  
**quadrants** 420:22  
**qualification** 7:8 213:16  
 214:8 355:15 357:11  
 357:19 358:14 366:22  
 374:7 389:1,4 399:19  
**qualifications** 7:7 11:7  
 195:22 355:2 358:16  
 377:16 398:8  
**qualified** 221:16 366:9  
 390:3  
**qualifiers** 53:15  
**quality** 169:2 357:15  
 366:11  
**qualifying** 381:15  
**qualitative** 408:7,9  
 409:5 446:11 447:3  
 448:11 453:16,19  
 455:4  
**quality** 104:19 294:15  
 354:16 365:3,8 366:1  
 366:5 370:7 371:21  
 377:1 389:11 394:14  
 397:11  
**quantification** 106:17  
**quantifier** 106:13  
**quantifies** 104:21  
**quantifying** 106:8  
**quantitative** 408:5  
 409:5 447:5 453:16  
 454:8,18  
**queried** 416:10  
**query** 418:17 421:20  
 424:5 425:18  
**querying** 391:11  
**question** 31:7 32:4 35:7  
 35:18 36:15 42:6  
 43:14,15 44:4 50:3  
 53:11 69:19 70:19  
 86:17 91:18,21 124:9  
 127:5,20 134:6  
 143:12 160:1 173:17  
 173:21 184:17 192:14  
 193:14,18 232:13  
 258:7 262:12 276:20  
 293:21 302:10 325:13  
 331:3 334:11,15  
 337:16 341:4 342:10  
 342:22 344:17 387:10  
 390:14 394:7,12  
 399:6,16 437:12,16  
 437:20 440:3 448:19  
 452:19 453:6,8  
 454:13 458:20,21  
 463:7,13,18 465:2,2,4  
 465:22  
**questioned** 181:17

**questioning** 455:5  
 463:20 470:3  
**questionnaire** 359:1,19  
**questions** 10:2 14:22  
 24:17 26:14 30:7,7  
 35:3 42:9 54:8 78:3  
 112:21 113:22 115:19  
 118:13 119:2 133:2  
 133:22 134:2 147:9  
 148:9 152:3 178:18  
 178:19 200:4 206:11  
 207:5 209:21 212:14  
 220:14 222:17 223:13  
 228:15,16 246:21  
 247:6,7 256:3 299:10  
 318:22 333:2 338:22  
 339:16 342:5 384:12  
 401:7 404:22 406:16  
 406:17,18 407:2,13  
 428:20 439:12 444:16  
 449:4,9 450:5,11  
 451:1,4,11,14 452:22  
 453:5,9,20 454:3,10  
 455:7,13 458:22  
 459:7,13 460:21  
 461:1,7,10 462:4,6,11  
 464:1,6,16 465:12,17  
**quick** 20:7 58:20 71:8  
 195:16 204:4 223:19  
 223:21 224:9,13  
 226:2 227:20 290:5  
 314:4 327:22 450:7  
**quickly** 70:18 84:17,19  
 123:20 199:9 230:12  
 262:18,21 265:1  
 266:8,12 273:13  
 386:5 402:1 425:22  
 430:2 448:19 452:15  
**quite** 23:22 116:18  
 148:13 250:8 257:20  
 262:8 294:22 312:8  
 332:11 340:16 365:16  
 374:19,20 395:9  
**quorum** 7:1 11:17

---

**R**


---

**R&D** 10:5 196:12 222:5  
 225:9  
**radius** 360:13  
**rail** 64:7 65:13  
**railroad** 39:6 94:16  
 134:11 182:2 184:9  
 187:14 190:2  
**raise** 18:19 58:9 131:2  
 327:3 341:3  
**raised** 27:17 77:15,16  
 464:10  
**rallying** 6:17

<b>RAM</b> 428:22	176:7 199:9 209:11	21:21 22:8 23:2 53:22	206:1 209:15 355:3
<b>ramp</b> 112:3 264:13	233:19 259:22 262:8	79:11 90:17 99:11	358:10 378:9 449:14
341:18	278:22 285:9 304:7	100:15,18 105:2,18	470:6
<b>ran</b> 241:10,15 246:10	314:4 384:20 411:16	110:20 112:14 113:11	<b>referred</b> 79:16 398:3,6
246:12,16 263:8	423:5 441:16 445:9	114:1,18 121:11,17	<b>referring</b> 176:2 193:21
282:7 285:7,7 370:4	461:11	121:22 122:1,2,12,16	254:6
370:14 438:22	<b>real-</b> 469:19	123:1,4,10 125:22	<b>refined</b> 56:22 188:6
<b>Randolph</b> 74:2,5	<b>real-life</b> 441:22	129:20 132:10 133:9	<b>reflect</b> 143:1,14 220:10
<b>random</b> 303:13	<b>real-time</b> 421:10	142:13 147:13 149:14	221:6
<b>Randy</b> 2:2 9:9 28:1 46:4	<b>real-world</b> 227:6	150:20 171:22 176:20	<b>reflected</b> 102:2
46:6 49:5 50:6,7 54:6	<b>reality</b> 158:16 192:10	346:5 427:1 444:14	<b>reflecting</b> 48:18
55:21 56:18 63:21	261:21 327:7	472:16	<b>refresh</b> 101:17
80:18 88:19 91:18	<b>realize</b> 104:8 246:10	<b>recommendations</b> 4:22	<b>regard</b> 41:5 56:6 81:10
94:8 95:17 97:16	259:19,19 282:5	18:15 19:11,14 20:5	203:18 205:19
98:15 115:20,22	<b>Realizing</b> 41:22	21:5,15,17 22:4,19	<b>regarding</b> 18:5 87:8
155:16 166:3 175:20	<b>realm</b> 63:14 135:14	26:20 29:15 56:5,14	127:15 171:22 365:4
<b>Randy's</b> 28:14 158:20	157:7,8,13 159:13	75:7 77:13 99:4 103:4	469:2
208:2	160:22	103:20 120:7 125:12	<b>regardless</b> 51:14 172:9
<b>range</b> 362:20 364:17	<b>reason</b> 45:20 68:22	127:5,17 131:3,16	334:10 376:15 428:8
<b>ranges</b> 388:14	157:20 158:3 214:11	146:16 168:6,7	<b>regimes</b> 365:6
<b>rankings</b> 324:3	242:3 292:22 320:1	178:21 179:3 182:15	<b>region</b> 45:5 165:1
<b>rant</b> 169:20	324:17 352:18 414:20	195:1 200:3 215:15	<b>register</b> 16:4 391:15
<b>rapid</b> 222:13	427:16,17 459:17	379:17	<b>registration</b> 15:20 16:2
<b>rapidly</b> 40:9 218:19	463:12 464:21	<b>recommended</b> 62:22	17:8
<b>rarely</b> 305:22	<b>reasonable</b> 116:20	151:6 173:11,12	<b>regret</b> 463:8,10 464:21
<b>rat</b> 58:14,18	146:9,11 149:6 177:4	202:1	<b>regular</b> 45:5
<b>rate</b> 264:18 392:19	<b>reasoning</b> 134:7	<b>recommending</b> 131:4	<b>regularly</b> 158:1 306:10
456:8,9	<b>reasons</b> 56:10 139:21	145:9 379:15	<b>regulate</b> 287:7,10
<b>rates</b> 456:21	170:6,9 214:5 269:21	<b>reconstruct</b> 67:6	<b>regulating</b> 145:3
<b>rationale</b> 186:22	298:20	<b>record</b> 11:21 54:6 92:13	150:13
<b>raw</b> 379:18 412:4,7	<b>reassure</b> 159:16	198:2 224:2 230:9	<b>regulation</b> 42:1 70:22
432:11,11,18 437:16	<b>reassures</b> 57:7	265:10 307:7 336:13	71:20 150:5 151:16
<b>re-</b> 325:7	<b>reauthorization</b> 98:10	352:3 369:20 422:19	152:12 168:2 244:17
<b>re-established</b> 195:7	99:5,17 104:17	447:18,18,19,21	278:2
<b>re-look</b> 337:14	<b>recall</b> 79:18 188:4	448:14 472:11 474:13	<b>regulations</b> 69:8 71:11
<b>reach</b> 32:4 270:3	221:6	<b>record-keeping</b> 377:12	89:7 90:20 93:10
282:20 283:2 326:1	<b>Recap</b> 3:18	<b>recorded</b> 11:20 329:2	114:21 115:7,11
344:11 347:2 350:8	<b>receive</b> 149:1 177:1	370:1 471:8	119:17,20 120:11
358:3,6	180:8 207:2 218:9	<b>recording</b> 370:4 380:3	121:13 127:12 128:5
<b>reaches</b> 415:11	255:18	<b>records</b> 152:9,11,12,18	128:7 129:22 130:3,5
<b>react</b> 84:8 207:3	<b>received</b> 201:12 204:18	153:15,19 154:3,8,10	131:4,13,17,19,22
<b>read</b> 5:5 20:19 27:13	<b>receiving</b> 206:10 265:4	324:4 372:1 430:4	132:9,20 133:12
80:17 102:5 155:15	369:10	440:21 445:16	142:3 148:20 151:3
162:7 199:11 217:22	<b>recoding</b> 394:3	<b>recover</b> 346:19	<b>regulator</b> 42:8 150:19
243:10 248:6 405:19	<b>recognition</b> 44:16	<b>recovery</b> 198:12	197:22 248:9 251:22
420:4 424:19 426:7	<b>recognizable</b> 51:1	<b>redact</b> 252:13	253:8,17 256:11,16
436:6 442:10,14,18	<b>recognize</b> 45:13 97:8	<b>Redshift</b> 427:11	256:19 257:1 259:19
<b>readily</b> 312:8	154:13 171:8 199:11	<b>reduce</b> 431:20 434:13	277:10,15 343:3,17
<b>reading</b> 122:15 132:3	218:4 299:3 351:18	<b>reduced</b> 366:4 413:8	344:4 345:9,11,17,18
228:9 289:21 450:20	<b>recognized</b> 321:16	<b>reducing</b> 60:3 452:11	351:22
465:14	<b>recognizing</b> 139:10	<b>reduction</b> 32:17,21	<b>regulator's</b> 345:11
<b>readings</b> 156:19 157:1	397:14	33:6,7,14 34:22 35:1	<b>regulator-</b> 345:1
157:20 397:16	<b>recombining</b> 413:3	64:16 364:18	<b>regulator-enforced</b>
<b>ready</b> 81:9 198:7,8	<b>recommend</b> 76:3 89:16	<b>redundancy</b> 413:5	345:1
202:11 229:10 256:19	90:18 95:18 104:12	<b>redundant</b> 357:17	<b>regulators</b> 9:8,20 36:9
289:13 352:5 398:10	112:9,15,18,19,20	<b>refer</b> 123:20 155:16	45:1 91:21 200:19
464:20	122:22 144:13 221:11	175:5 253:14	213:8 245:17 256:15
<b>real</b> 76:22 132:6 169:1	<b>recommendation</b> 5:2,9	<b>reference</b> 20:11,18 22:9	256:19 380:22 399:22

**regulatory** 7:21 9:10,12  
84:14 87:1 88:17,20  
103:17 115:17 119:7  
119:15 151:11 172:4  
173:7 186:14 219:8  
233:12,18 239:22  
251:16 312:22  
**reinforce** 169:18  
**reinforces** 83:8,10  
**reinstall** 283:8  
**reinvent** 376:10  
**reiterate** 469:9  
**reject** 132:13  
**rejigger** 196:21  
**relate** 134:14 165:16,17  
242:16 354:3 392:6  
407:11  
**related** 51:2 63:13  
69:13 71:9 93:20  
123:4 155:10 156:18  
156:19 157:1 165:20  
177:2 179:18 184:6  
187:8 269:4 331:6  
333:2 359:21 400:8  
**relates** 89:19 93:22  
121:5 122:3,5 133:4  
165:15 166:15 167:14  
230:20 355:8 357:10  
**relation** 356:20  
**relational** 425:2  
**relationship** 41:21 45:3  
45:6,8 52:14 93:2  
339:17 342:17  
**relatively** 192:7 401:22  
453:12  
**relaxed** 59:9 60:1,6,14  
60:18 61:3 143:21  
**release** 121:7,8,10,14  
122:19 123:5,6,10,13  
123:13,14,19 124:13  
125:1,19 129:3,4  
130:11 149:11 178:4  
462:5  
**released** 124:18 129:8  
**releasing** 122:11,13  
**relevant** 22:20 71:20  
162:9 186:6 409:15  
409:20 438:14  
**reliability** 365:13  
**reliably** 360:5,12  
**relied** 116:12  
**relocate** 363:22  
**relook** 80:14  
**reluctance** 35:21  
**rely** 77:14 337:8 375:13  
**remain** 95:15  
**remainder** 17:12 411:3  
**remains** 305:9

**remarks** 3:6,18 6:3  
14:21 32:20  
**remediate** 66:9 158:1  
**remediating** 62:3  
**remediation** 30:12,16  
36:18 61:13 392:11  
**remember** 13:17 38:11  
65:12 70:1 116:1  
138:9 197:12 230:21  
230:22 272:12 373:5  
399:5 432:9 439:16  
**remembering** 87:10  
**remind** 12:4 39:1 144:9  
170:15 468:22  
**reminds** 103:4  
**remotely** 327:9  
**remove** 43:2 134:15  
398:15  
**removed** 179:4  
**removing** 141:12  
**rent** 222:8 429:20  
**repair** 61:18 364:1  
**replace** 415:10  
**replaced** 460:14  
**replacement** 258:18  
374:16  
**report's** 119:16 201:15  
255:12 305:18  
**reportable** 70:8 81:18  
83:17  
**reported** 54:13 61:22  
62:11 67:12 118:11  
118:19 154:17 159:1  
183:1,3 224:12  
248:22 270:2 273:13  
279:13 283:3 350:5  
364:5  
**reporter** 20:1 256:2  
470:8,18 471:2,4,6  
473:10,11,14,19  
474:1,9  
**reporters** 279:17  
**reporting** 7:17 24:22  
110:19 153:20 169:22  
170:12 179:10 184:19  
190:4,22 191:3  
192:15 193:2,13  
196:5 224:6 229:2,3  
248:12 288:9,21  
292:17 296:10 318:4  
336:17 338:18 340:2  
373:12 375:22 376:13  
379:13 401:14 469:10  
469:15,15  
**reports** 18:13 38:14  
115:12 130:1 170:1  
192:20 195:6 221:4  
230:12 238:5 239:20

244:22 247:19 250:4  
254:10,11 257:6  
259:11 263:15,18,20  
264:3 265:3 266:17  
267:7,10 268:10,15  
269:21 276:5 283:4,5  
283:12 285:21 290:21  
291:17 293:1,3,20  
295:15 316:12 317:7  
326:19 327:19 328:2  
328:8,10,11,19  
331:19 333:10,19,20  
337:12,13 348:15,18  
350:7 364:9 401:15  
408:5 421:13  
**repositories** 107:2  
**repository** 410:14  
**represent** 9:3,11 10:14  
11:10 233:14 238:14  
**representation** 78:1  
262:7  
**representative** 1:16  
6:22 85:5 253:10  
256:5,22 258:10,20  
355:16  
**representatives** 52:11  
255:21 265:3  
**representing** 7:4 8:2,14  
8:19 9:7,20 10:8,12  
10:17,22 74:9  
**reputation** 324:7  
**request** 105:1 106:9  
108:3 123:8 125:21  
349:12  
**requests** 104:9 111:14  
111:14 112:11 124:1  
**require** 24:5 28:17  
86:22 91:14 104:9  
127:10 136:15 166:5  
367:4 371:17  
**required** 118:21 129:3  
129:5 154:3 155:2  
166:18 288:2 312:10  
356:13 377:2 378:18  
396:12  
**requirement** 54:14  
153:10 274:9 288:4  
362:11 399:2  
**requirements** 94:14  
109:13 126:11 221:1  
356:10 357:6,19  
358:14 361:17 362:19  
378:12 404:5  
**requires** 177:7 348:13  
392:11 397:2  
**requiring** 182:7 354:2  
**requisition** 93:9  
**research** 1:12 8:2

222:20 439:2  
**researchers** 440:1  
458:7  
**reservation** 66:1  
**resistivity** 389:18  
**resolution** 202:12  
**resolve** 407:12  
**resonate** 57:10  
**resonated** 470:4  
**resource** 26:14,18  
449:21  
**resources** 169:1  
**respect** 46:7,20,22  
78:13 89:10 90:9  
94:12 114:18 120:12  
211:12 214:7 218:11  
**respective** 211:2  
213:21  
**respond** 87:17 157:17  
169:16 192:20 452:15  
**responded** 111:13  
**response** 188:5 267:12  
268:6,9,9 397:1  
**responses** 267:9  
**responsibility** 350:8  
351:6 470:12  
**responsible** 235:5  
286:1 301:2 350:4  
**rest** 16:21 158:8 194:6  
199:7 280:21 438:17  
450:15  
**restaurant** 15:8  
**restrict** 129:7  
**restricted** 128:22  
**restrictions** 168:22  
**restrooms** 5:11,14  
**result** 32:22 179:10  
358:9 409:6 454:17  
459:2  
**results** 148:12 202:18  
205:7 208:3 212:1  
354:17 366:18 370:17  
371:4,20 373:14  
375:1,22 381:20  
385:7 386:18 393:13  
407:14 416:11  
**resume** 15:15  
**resumed** 198:2 224:2  
352:3  
**resurgence** 425:11  
**retain** 82:1 470:8  
**retaliation** 178:22 180:8  
190:13  
**retaliatory** 179:9  
**retire** 244:2 415:12  
**retired** 415:6  
**retiring** 284:17  
**retrieval** 425:9

- retrieve** 17:7 138:17  
 139:6,7  
**returns** 418:18  
**reveal** 212:9  
**reverse-** 465:21  
**review** 23:5 160:12  
 166:17 171:3 201:19  
 226:2 246:1 252:22  
 253:15 365:2 366:13  
 446:16  
**reviewed** 30:2 294:9  
 367:1  
**reviewing** 226:4  
**reviews** 365:7  
**revise** 100:18  
**revision** 300:21 377:12  
**revisit** 74:13 79:6  
**reward** 28:8  
**RGIS** 380:12  
**Rhode** 181:4,8  
**rich** 218:15  
**ride** 311:3 340:15 341:6  
**rig** 241:11 243:14 257:8  
**right-hand** 5:15 309:8  
**rightfully** 107:21  
**rigid** 422:10 459:15  
**rigorous** 221:3 357:14  
 370:13,19 388:22  
 389:3  
**rigs** 242:18  
**risk** 30:11,12,12,17  
 31:19,22 32:5,11,11  
 32:13,14,17,21 33:3,5  
 33:6,6,13 34:2,9,22  
 35:1 60:4 61:12 64:16  
 64:16 67:21 68:8,9  
 82:12,12,12 84:12  
 91:4 107:4,4 138:1  
 151:9 153:17 172:13  
 264:18,21 265:2  
 266:7 267:11 268:22  
 286:14,15 316:17  
 337:3 465:19  
**risk-prevention** 66:3  
**risks** 36:17 82:11 84:8  
 84:18 86:15 170:18  
 171:5 268:5  
**riveted** 407:6  
**riveting** 102:9 379:8  
**road** 96:20 246:13  
**roadmap** 447:9  
**roads** 246:9  
**ROBERT** 1:18  
**Roberti** 2:11 349:9,20  
 351:18 455:21 457:15  
**Robin** 225:14  
**robust** 23:19 27:14  
 30:13 32:6 42:10  
 131:9 193:14 221:3  
 384:17  
**rock** 393:19,20  
**rode** 450:10  
**RODRIGUEZ** 2:11  
 113:2 229:3  
**role** 172:12 206:8  
 222:22 350:12 442:21  
 454:5  
**role-based** 458:7  
**roles** 226:8 410:22  
 439:13  
**roles-based** 438:18  
**roll** 58:6 320:8 461:22  
**rolled** 63:15  
**rolling** 108:11  
**rolls** 444:18  
**room** 56:19 86:5 87:21  
 132:19 151:17 161:6  
 243:17 287:7 405:4  
**root** 85:7 245:1 284:3  
 367:4,8 372:17  
 389:14 457:9  
**Rosen** 443:17  
**routine** 45:2 61:15  
 81:16 445:9  
**row** 330:20 418:18  
**rows** 426:4  
**rude** 12:14  
**rudimentary** 446:5  
**rule** 67:16,19 174:21  
 335:13,17 336:11  
 338:12  
**Rule-making** 378:15  
**rulemaking** 115:18  
 119:20  
**ruler** 387:1  
**rules** 94:19 120:10  
 146:1 181:3,10  
 220:17 314:21 315:1  
 315:2 335:20 342:12  
 350:1  
**run** 16:18 88:6 208:18  
 223:11 241:12 248:3  
 257:5 263:14 328:14  
 360:5 362:14 365:13  
 365:15,19 366:16  
 368:4 369:21,22  
 370:22 372:2 374:10  
 381:19 391:13 392:22  
 413:6 415:2 427:21  
 432:2 438:1 440:16  
 448:2 454:11,12,12  
 463:21 465:7  
**running** 254:20 286:4  
 361:4,6,9 373:13  
 413:10 435:10 438:7  
 445:11  
**runs** 225:19,20 368:15  
 368:17 447:20 464:7  
**runway** 249:15 250:10  
 320:8  
**rush** 64:11 198:13  
 260:13  
**rushed** 326:11
- 
- S**
- 
- S3** 425:19 427:18  
 428:16 430:2,22  
**sad** 158:11  
**safe** 52:4 158:15 178:6  
 238:1 474:11  
**safeguards** 57:5  
**safely** 361:7  
**safer** 242:2  
**safest** 317:21  
**safety's** 312:7  
**Safety-** 269:3  
**sample** 333:21 358:22  
**sat** 81:2 331:22  
**satisfactory** 356:13,16  
**satisfy** 275:13  
**save** 16:12 102:8  
 152:22 205:17 258:6  
 394:3 433:5 439:12  
**saw** 35:8 75:8 76:21  
 80:13 176:2 242:11  
 242:12 280:1 296:20  
 327:16 408:8 434:17  
 457:6 464:6  
**saying** 60:22 70:5,13  
 111:15 118:4 122:6  
 122:21 123:2 124:17  
 129:4 130:17 131:20  
 137:10 138:21 149:18  
 152:21 154:9 158:8  
 158:15,22 159:14  
 161:7 163:20 175:5  
 176:1 232:21 295:14  
 315:9 341:13 344:7  
 380:20,21 382:2  
 385:8 406:16 434:6  
 445:21 446:6 452:13  
**says** 51:22 62:2 89:14  
 121:11 139:4 153:9  
 153:22 176:13 188:6  
 237:20 238:16 247:12  
 261:3,6 264:11  
 272:22 274:10 284:10  
 285:4,9,15 289:10  
 291:4 293:9 296:4  
 320:21 338:4 347:13  
 372:2 391:1 403:1  
 431:16 433:10 441:19  
 442:4 450:9  
**scalable** 411:16 428:2  
**scale** 171:9 411:10,18  
 411:21 412:1 431:14  
**scaling** 428:14 429:17  
 429:18  
**scared** 435:14  
**scatter** 386:9  
**scenario** 72:21  
**scenarios** 146:5  
**schedule** 19:3 198:12  
 356:5 469:10,13  
**scheduled** 158:1  
**scheduling** 358:20  
**school** 17:5 234:6  
 387:2 390:6 453:2  
 459:11  
**science** 429:10  
**scientific** 444:5  
**scientist** 454:6  
**scope** 53:19 160:6  
 162:5 164:13 170:13  
 353:20 355:13 356:18  
 356:19 358:13,17  
 379:20 385:4 390:5  
**score** 275:4  
**Scotty** 100:19  
**screams** 97:2  
**screen** 5:4 397:11  
**screwed** 239:17 341:3  
 341:21  
**scrub** 130:19 381:17  
 399:18  
**scrubbed** 136:20  
 141:18  
**scrutiny** 107:22  
**se** 131:21 153:15 203:6  
**Seal** 10:14  
**seamless** 25:7  
**search** 426:1  
**seat** 102:10 247:1  
 297:10 341:7  
**second** 26:2 43:14  
 79:15 81:17 103:22  
 175:13 177:14 214:10  
 215:1,2 216:10  
 218:22 219:17 225:6  
 244:21 248:5 367:9  
 375:2,11 430:10  
 437:5  
**seconded** 210:18  
**Secondly** 140:1  
**secret** 252:4 312:8  
**secretary** 4:22 5:3  
 18:14,15 19:12 90:18  
 99:4 104:12 167:20  
**secretary's** 49:12  
**section** 4:15 22:4 81:21  
 450:15  
**sections** 21:4 24:3

76:15 81:21 358:19  
**secure** 57:6 207:22  
 405:8 412:12,20  
 419:8  
**security** 5:13 6:12  
 114:12 217:2 269:12  
 269:13 404:4 410:22  
 412:17 418:16 419:2  
 419:11 432:15 434:22  
 435:2,5,7,10,17  
 436:12 437:9 440:16  
 440:20  
**seeing** 69:12 74:19  
 143:21 158:6 259:2  
 296:9 372:16 396:15  
 421:8 424:16 467:7  
**seek** 22:19 90:19 473:8  
**seeking** 473:14  
**seen** 63:6 74:10 77:3  
 80:5 82:6 137:5  
 143:14,19 164:21  
 165:4 233:5 234:2  
 287:2 321:11 323:2  
 346:7 373:4 393:16  
 396:6 434:3  
**sees** 53:5  
**segments** 376:17  
**segregated** 88:5  
**segue** 196:7 263:6  
**segues** 281:4  
**select** 359:4  
**selection** 358:19  
 360:18  
**selects** 361:1  
**self-assessments**  
 163:5  
**self-audit** 148:16 149:4  
 149:9,19 155:22  
 160:20 161:4,12,17  
 164:12,13 166:6,8  
 168:17,20 169:2  
**self-auditing** 66:7  
 67:18 152:17  
**self-audits** 148:12,22  
 151:10,22 152:1  
 157:11 160:14,18  
 163:5 165:18 167:14  
 172:1,12 353:1  
**self-discloses** 63:7  
**self-disclosure** 165:1  
 350:2  
**self-executing** 127:13  
**self-monitoring** 67:17  
**self-propelled** 356:21  
**self-sufficient** 472:6  
**selling** 297:17,18  
**Senate** 229:17  
**send** 255:7,20 257:9,17

267:12 301:18 310:3  
 319:3 328:19 380:6,8  
 380:8 461:22  
**sending** 255:13 469:1  
**sends** 282:2 302:13  
**senior** 7:3 10:3,16 11:4  
 44:2 346:12 350:6  
 402:19  
**sensational** 83:18  
**sense** 19:4 26:21 29:18  
 34:7 36:5,17 40:11  
 124:3 139:16 143:3  
 153:2 162:15 186:22  
 187:1,2 196:9 197:7  
 211:19 213:6 311:3  
 344:8 373:7 421:12  
 443:1 447:4 464:22  
**sensitive** 114:11,11  
 115:8,8 181:13,14,18  
**sensor** 366:3  
**sent** 257:19 300:22  
 311:10 321:17  
**sentence** 129:21  
 139:20 140:6 141:12  
 143:3 248:8  
**separate** 51:19 67:9  
 138:3 141:4 143:18  
 162:10 164:17 197:20  
 333:4 340:13 349:6,7  
 363:9 376:6  
**separately** 452:2  
**sequel** 431:21  
**series** 80:8 453:12  
**serious** 83:19 261:4  
 322:15 430:14 451:8  
**seriously** 384:16  
**serve** 7:7,16 9:15 26:18  
 96:8  
**server** 417:2 427:10  
 446:7  
**service** 9:19 11:13 64:5  
 93:12 96:5 106:7  
 211:13,20 354:10  
 356:8,11 357:13  
 365:2,7,10 366:9,10  
 389:13 415:11 416:20  
 417:1 436:10 439:9  
**services** 10:11 168:15  
 470:9 473:8,15  
**serving** 9:2 10:4 11:5  
**session** 210:2  
**sessions** 280:21  
**set** 12:7 15:11 52:5  
 77:13 94:17 120:9  
 124:19 126:1 129:16  
 244:4 247:22 291:5  
 330:20 346:20 371:19  
 389:16 390:16 391:10

391:12 413:17 432:6  
 451:13  
**set-wise** 399:21  
**sets** 40:6 404:1 407:18  
 408:4 432:2  
**setting** 89:6 92:9,11  
 94:5  
**settle** 198:5  
**settled** 59:4  
**setup** 245:2  
**seven** 18:10 19:9 22:5  
 168:16 374:12,13,14  
 374:17 375:14  
**seven-year** 460:8  
**seven-year-** 374:15  
**seven-year-old** 429:1  
**SGA** 44:14 219:4  
**shake** 64:2  
**shape** 17:20 28:8 29:3  
 92:17 115:18  
**share** 12:21 13:22  
 14:20 22:21 35:11,22  
 36:14,20 42:18 44:12  
 44:22 45:1 46:17  
 63:10 65:18 72:16  
 77:19,20 78:20,21  
 84:12 85:3,12 86:11  
 113:15 120:18 124:19  
 129:9 133:6 138:8  
 141:3 149:15 160:19  
 161:7 162:18,19  
 167:5 170:4 193:4  
 203:15 279:10,14,20  
 280:5 283:12 312:6,8  
 330:17 331:1 360:1  
 366:15 380:10 399:20  
 400:4,10,12 408:18  
 420:17 423:13 436:7  
 439:8,8  
**shared** 17:10 37:3  
 42:19 52:6 67:8 72:16  
 75:12 110:17 126:13  
 126:18 129:18 174:5  
 354:3,18 359:18  
**shares** 373:21  
**SHC** 285:5,10,11  
**sheets** 261:20  
**shelter** 308:1  
**Sherry** 2:8 8:4 66:13,15  
 73:18,20 79:4 85:20  
 105:3,4,20 106:20  
 128:11 183:13 184:14  
 184:15 192:14 204:19  
 211:5 229:2,3 390:9  
 390:11 408:15 432:8  
 454:8  
**shield** 311:4,7  
**shift** 56:11

**shifting** 41:18  
**shifts** 446:22  
**shocked** 59:9  
**short** 32:9  
**short-lived** 342:11  
**shorted** 156:20  
**shorter** 84:2 195:10  
**shortly** 224:17 226:20  
 273:17  
**shorts** 156:20  
**shotgun** 386:9  
**should've** 388:7  
**shoulder** 297:10 301:13  
**show** 78:12 129:11  
 181:7 228:7 230:9  
 235:7 241:1 266:15  
 279:21 280:15 284:13  
 294:1 308:2 340:17  
 353:17 424:6 429:22  
**showcase** 106:11  
 472:18  
**showed** 266:13 323:2  
**showing** 120:9 324:11  
**shows** 55:9 73:17 139:1  
 281:11 439:18 466:6  
**shred** 305:18  
**shuffle** 441:18  
**shuffling** 441:16 442:1  
**shunted** 49:18  
**shy** 12:13  
**sick** 236:21  
**side** 5:15 12:8 18:16  
 49:18 52:7 60:5 74:3  
 74:4 75:11 76:21 79:4  
 169:5 226:9 250:10  
 250:15 284:10 297:19  
 309:8 338:22 339:2  
 378:19,21 398:7  
**sides** 329:5  
**sign** 193:17 246:6,10  
 246:12,16 248:2,4  
 266:18 306:18 369:13  
**sign's** 248:1  
**signed** 128:9 313:3  
 349:5 469:12  
**significant** 35:7 250:5  
 251:18 280:11 356:1  
 367:2,6 371:10  
**silence** 5:17  
**sim** 271:15 307:3,4  
**similar** 116:2,19 126:9  
 138:4 147:21 186:18  
 220:15 237:12 273:15  
 310:20 316:19 344:10  
 345:8 430:9 431:22  
 443:9 448:12 455:5  
**similarity** 202:20  
**similarly** 129:6

- simple** 36:2,14 151:16  
 249:19 307:11 308:16  
 418:14 421:22 422:18  
 423:19 424:7 463:13  
**simplicity** 202:17  
**simplify** 433:2  
**simply** 26:9 27:3 30:20  
 57:2 62:22 142:10  
**simulator** 240:11  
 270:20,21 275:15,15  
 304:18 306:8,17  
**Simultaneous** 47:16  
 62:13,19 63:20 119:9  
 130:6 150:16 153:7  
 161:15 162:11 172:22  
 173:5 182:5,22 197:2  
 214:19  
**Singapore** 185:19  
**single** 136:15 174:13  
 174:14,17,19 265:13  
 391:15 412:7 421:16  
**sins** 177:16 307:15  
 308:7  
**sir** 255:1 258:8 276:19  
 279:3 295:9 328:6  
 333:1 336:2 338:20  
 344:15 349:8  
**Siri** 296:4  
**sisters** 57:2  
**sit** 203:2,3 237:6 301:17  
 331:21 455:10 458:17  
 461:15  
**site** 182:9  
**sites** 217:17  
**sits** 347:16  
**sitting** 14:13 16:9 18:17  
 26:7 178:20 229:22  
 298:8 309:8 341:7  
 393:18 450:20  
**situation** 45:9 61:6  
 138:3 145:8 179:21  
 458:18  
**six** 69:20 158:18 242:1  
 337:9  
**size** 362:15 397:6  
**sizing** 363:12 367:3  
**skewed** 386:6  
**skills** 216:3  
**skin** 51:13 60:2 85:14  
 412:12  
**skip** 225:4 353:16  
**Skow** 201:13  
**sky** 309:6  
**slave** 431:17  
**sleep** 235:22  
**slice** 352:9  
**licing** 423:3  
**slide** 13:9 73:16 175:6  
 175:16 176:1 187:21  
 201:10,17 222:19  
 255:11 266:13 377:20  
 403:1 406:1 444:18  
 448:13 452:2,3  
**slides** 218:2 421:21  
**slightly** 98:5  
**slow** 122:15 343:10  
 427:22  
**small** 20:19 57:13,14  
 170:13 359:10 441:13  
**smaller** 169:12 194:11  
 386:7  
**smart** 158:16 234:8  
 327:1 462:3,10,11  
**smarter** 58:10  
**SMEs** 216:12  
**smoke** 179:15  
**SMS** 2:12 3:11 13:15,21  
 42:14 66:4,6 67:15,16  
 81:21 82:2 151:4,9  
 157:11,14 162:6  
 165:8,9,18 166:1  
 167:6,14 171:2 235:4  
 264:5,5 265:1 266:17  
 268:13 286:16 288:11  
 295:1 300:12,15  
 316:3,3,5 337:18,20  
 338:12,14,14 339:4,6  
 378:1  
**snapshot** 17:11 20:7  
 21:20 22:11 414:22  
 415:2  
**social** 440:20  
**socially** 449:7  
**softened** 163:19,22  
**software** 357:8 422:14  
**soil** 389:18 438:12  
**soils** 457:2  
**solely** 117:5,6 124:16  
 160:14 161:4  
**solicit** 25:20 208:14  
 283:4  
**solid** 370:6  
**solution** 172:18 190:19  
 379:14 436:19  
**Solutions** 2:13 10:12  
 225:13  
**solve** 286:6 404:13  
 434:21 448:20 453:11  
 457:3  
**solved** 59:3  
**somebody** 68:12 69:2  
 190:12 197:14 210:9  
 232:13 238:17 253:11  
 254:20 257:5 259:9  
 271:5 277:14 278:1,4  
 290:12,14 293:2  
 303:10 337:16 346:11  
 346:12 350:9 439:4  
 442:14 445:15 452:9  
 452:17 454:6,7  
**somebody's** 326:15  
**someday** 247:17  
 326:16  
**someone's** 44:3 306:9  
**something's** 296:2  
 350:5  
**something-** 257:9  
**something@chevron...**  
 257:10  
**soon** 289:8 369:15  
 446:2 453:13  
**sooner** 84:13  
**sorry** 46:4 55:19 58:3  
 58:17 60:18 74:4,5,9  
 115:21 135:3 150:10  
 162:1 175:22 212:18  
 262:14 355:10 375:6  
 402:6 403:7 405:4  
 408:16 458:21 462:7  
 463:4,12 465:2,18  
**sort** 17:6 25:16 33:11  
 35:14 36:5 44:5 57:19  
 69:13 70:10,17 72:18  
 92:11 97:1 109:9,16  
 123:1 128:12 136:22  
 152:6 160:2 169:20  
 186:13 213:7 322:22  
 342:14 398:1 409:18  
 413:13 417:15 420:21  
 449:15 452:2 462:12  
**sorts** 174:18 460:3  
**sound** 213:4  
**sounded** 195:3 446:13  
 446:15  
**sounding** 26:19  
**sounds** 55:5 150:12  
 183:14 197:9 324:21  
 343:2  
**source** 140:12 192:11  
 268:13 280:6 305:3  
 334:16 439:15,16  
 446:6  
**sources** 57:21 143:7  
 148:11 397:17 408:2  
**sourcing** 365:4  
**south** 272:22 312:9  
**Southern** 319:16  
**Southwest** 263:21  
 273:14 294:16 335:12  
**SP-0102** 357:9 358:10  
 358:18  
**space** 16:20 68:9 369:9  
 415:1 422:21 438:22  
 442:21  
**span** 415:12  
**speak** 12:5,13 39:17  
 54:7 60:16 113:3  
 138:5 142:18 175:20  
 216:18 346:8 404:5  
**speakers** 12:9 14:16  
 23:16  
**speaking** 44:9,9,22  
 47:16 62:13,19 63:20  
 119:9 130:6 150:16  
 153:7 161:15 162:11  
 172:22 173:5 182:5  
 182:22 197:2 214:19  
 232:1  
**spec** 354:18 361:14  
 362:18 363:14 364:3  
 364:19 366:8,12  
 371:6 374:2 376:6  
 380:3 388:8,17  
**special** 67:19 212:21  
 435:6  
**specialties** 445:7  
**specific** 75:17 82:11,17  
 86:15 89:22 94:2  
 97:11 100:3 117:8  
 123:8,18 125:17  
 131:7 142:3 161:8  
 162:17,17 166:10,20  
 172:5 259:10 314:20  
 314:22 315:2 362:14  
 383:9 400:1  
**specifically** 20:5  
 105:18 121:11 141:22  
 142:4 172:3 180:15  
 180:17 225:12  
**specification** 354:6,7  
 361:18 367:8 387:22  
 397:19 418:11  
**specifications** 397:5  
**specifics** 28:12  
**specified** 218:17  
**specs** 362:12 363:9  
 371:3 374:9 397:7  
**spectral** 373:2 375:21  
**speed** 222:13 364:16  
 368:15 369:21 395:18  
 397:6  
**spelled** 187:13 363:6  
**spend** 77:17 82:15,18  
 159:7 365:14 410:12  
**spending** 315:11  
**spent** 50:9 226:22  
 261:18 365:16  
**spirit** 222:4,12  
**spoke** 23:20  
**sponsorships** 473:14  
**spot** 53:10 428:10  
**spreading** 318:1

- SQL** 418:17 419:10  
 427:9 446:6  
**St** 319:22  
**staff** 3:3 18:19,20 19:16  
 19:22 20:8 157:13  
 216:12 229:21,22  
 230:3,6  
**stage** 234:3 349:11  
 472:7  
**stages** 226:18  
**staggering** 334:15  
**stake** 182:17  
**stakeholder** 77:19 92:6  
 101:10 206:12 211:2  
**stakeholders** 82:4 83:5  
 113:15 200:19 206:6  
 217:12,18 227:22  
 228:1  
**stand** 79:14 104:4  
 309:7,9,14 311:13  
**standalone** 37:6  
**standard** 14:2 42:2,2  
 71:15 170:1 202:3  
 272:9 292:14 353:11  
 355:19 356:10 357:8  
 378:1 394:14 397:2  
 417:16,18 418:10,19  
 420:21 425:2 430:19  
 452:7 454:16 455:1  
**standard's** 357:5  
**standardization** 377:17  
 423:12  
**standardize** 204:1  
**standardized** 379:13  
**standards** 68:7 355:1  
 378:14 408:12 420:12  
 447:6 454:19  
**standpoint** 103:16  
 109:11 406:8 415:8  
**stands** 294:15 440:17  
**standup** 307:15  
**stars** 443:5  
**start** 7:1 14:13 22:21  
 30:8 92:21 108:16,17  
 195:21 201:18 203:22  
 209:13 222:4 229:9  
 229:10 257:15 281:20  
 283:18 318:2,3  
 327:19 334:12 335:2  
 346:11 396:1 406:22  
 409:3 415:9 421:7,8  
 422:15,22 423:2,8  
 424:7 431:3,10  
 433:21 441:4 446:5  
 447:1,9 448:10,11  
 451:22 452:10 453:18  
 454:3 457:21 459:7,9  
 459:19 460:17 461:7  
 461:21 462:12 472:8  
**started** 28:5 86:4 87:1  
 170:3,5 185:15 198:5  
 209:10 213:14 224:5  
 231:21 232:3,17  
 233:3,9,20,22 234:3  
 234:13,17 238:11,12  
 238:12 242:11,13,19  
 245:14,15 263:7,14  
 280:13 288:2,11  
 297:17 299:9 323:16  
 329:18 346:9,17  
 347:6,17 348:21,22  
 348:22 349:11 352:6  
 392:15 411:14 427:3  
 430:15 454:9 459:14  
 463:18 464:9  
**starting** 13:2 40:3  
 166:16 234:5 243:5  
 244:1 263:11 318:11  
 318:12 346:7  
**starts** 158:18  
**state** 8:1 9:7,19,20 36:9  
 39:2 41:1 46:20 61:15  
 62:17 64:5 65:11,17  
 69:8 71:12,15,17 72:3  
 72:9 91:21 111:20,21  
 114:22 133:13 144:11  
 144:15 145:1 147:17  
 149:2,12 166:4  
 176:10 197:22 219:8  
 229:16 342:11 351:22  
 370:6  
**state's** 69:1 138:13  
**stated** 338:13 371:3  
**statement** 3:4 29:13  
 31:9 33:11,22 34:15  
 48:7 74:10 89:13  
 100:12 102:3 154:13  
 199:10 219:6 223:3,4  
 225:5 279:19 381:3  
 405:16 455:18  
**statements** 21:9,11  
 452:13  
**states** 1:1 62:9,14,18  
 62:21 69:7,21 70:4,16  
 70:21 71:2,13,19 72:1  
 91:11,22 92:4,7,12,16  
 155:11 169:12 179:13  
 274:17 294:20 312:7  
 314:2 315:17,18  
**static** 410:4 414:22  
 415:22 445:10  
**stating** 140:1 310:15  
**station** 246:13 259:17  
**stationing** 363:20  
**statistical** 333:20  
 362:20 363:2 381:20  
 388:15  
**statistically** 362:12  
 371:9 388:9,13  
**statisticians** 216:17  
**statistics** 416:2  
**status** 355:19  
**statute** 115:14 116:22  
 121:17 122:18 123:21  
 124:12 125:5 126:7  
 131:12,21 132:4,20  
 144:10 146:3 148:19  
 166:13 167:11 187:13  
 218:18  
**statute's** 192:18  
**statutes** 73:3 93:18,21  
 128:7 134:10 144:18  
**statutory** 47:20 71:10  
 72:12 93:16 94:5,11  
 95:19 128:10 132:1  
 132:10 146:18 147:21  
 170:4 187:11 188:19  
**stay** 15:6 86:21 229:21  
 314:1  
**steal** 231:8  
**step** 68:12 151:19  
 168:8 283:22 344:6  
 344:14 406:5 434:6  
**step-by-step-by-step**  
 260:20  
**stepping** 224:21  
**steps** 196:5,8 208:6  
 401:17 451:10 453:12  
**sterile** 38:20  
**Stewart** 208:16  
**stick** 14:17  
**sticks** 422:9  
**stir** 422:7  
**stock** 459:4  
**stood** 127:8  
**Stoody** 2:12 48:16,16  
 111:10 119:13 125:10  
 126:22 145:21 147:4  
 367:15,21  
**stool** 96:9,12 253:16  
 435:16  
**stool's** 253:18  
**stop** 35:4 38:1 63:19  
 190:21 223:17 246:10  
 246:12,16 248:1,2,4  
 266:18 401:11  
**stops** 435:21  
**storage** 134:18 410:6,8  
 411:17 425:1,13,20  
 427:6 445:5,9 447:15  
**store** 44:3 54:22 59:16  
 408:10 412:19 427:19  
 437:16,18 443:11,20  
 445:14  
**stored** 412:18 448:3  
**storing** 413:1 432:10  
**story** 304:3 309:22  
 329:6 426:8  
**story's** 460:8  
**story-telling** 446:11  
**straight** 6:14 199:16  
 385:20 463:5  
**strange** 308:7  
**strategic** 27:21 28:16  
 28:19 29:5 30:4,6,7  
 30:12,20 31:4 35:7  
 57:7 127:15,16  
**strategically** 31:18  
 84:10  
**strategies** 30:15,16  
**strategy** 33:12 88:4  
 112:17,21 152:3  
**stream** 28:18  
**streaming** 415:13,21  
**streets** 246:9  
**strength** 456:11  
**strengthen** 227:17  
**strengths** 81:3  
**stress** 190:11  
**stretch** 116:18  
**strict** 106:18 117:3  
 126:11  
**strike** 111:22 139:19  
 140:5  
**striking** 143:3 387:7  
**stringent** 71:3  
**stringing** 410:4  
**strip** 117:7 136:13  
**strong** 36:7,8 128:3  
 442:9  
**structurally** 40:19  
**structure** 18:13 29:19  
 29:20 37:9 110:18  
 127:22 129:16 130:8  
 185:18 193:1,8  
 425:13 442:22  
**structured** 128:2 408:3  
 409:4,4  
**structures** 427:5  
**struggled** 424:11  
**struggling** 156:15  
**stuck** 100:4,7 360:15  
 369:12  
**studies** 80:9,20 227:3  
**study** 59:16,17 60:9  
 86:16 181:2  
**stuff** 102:11 139:4  
 157:15 158:19 169:3  
 169:8 219:3 236:15  
 240:17 244:7 284:21  
 295:3 302:6 323:20  
 346:3,4 353:16

377:13 395:20 406:3  
 411:15 421:3 424:7  
 424:10 426:7 430:11  
 430:20 444:17 445:3  
 460:16  
**stuffed** 230:11  
**stuffs** 262:16  
**stupid** 243:18  
**sub-bullets** 205:9  
 207:12  
**Sub-C** 412:19  
**sub-committee** 353:14  
**sub-standards** 355:3  
**subcommittee** 3:9 7:8  
 7:17,21 8:7,16 9:2,13  
 10:5,19 11:7 13:2  
 14:4 16:13 18:6 19:17  
 19:17,19 20:17,21  
 22:13,18 23:16 24:14  
 24:18 27:10 48:3,12  
 55:17 61:4 73:12,16  
 73:17 75:2,15 79:19  
 80:12 82:15,21 88:21  
 98:17 101:21 103:5  
 104:3 110:8,21  
 113:12 143:2 144:4  
 145:15 147:6,11  
 165:22 168:10 175:6  
 188:17 198:11,19  
 199:3,7,13 200:10  
 204:15 205:14 206:19  
 209:12 211:6 213:16  
 214:2 215:11 223:15  
 224:6,18 229:1 405:6  
 426:22 466:7,18  
 467:19 469:15  
**subcommittee's** 80:2  
 222:15 466:16  
**subcommittees** 15:2  
 18:1,5,8,10 19:5,9,10  
 19:20 20:4,10,14 21:6  
 21:7,10,14 22:6 23:9  
 23:11,13 24:1,2,8,11  
 41:11 76:7,18 78:8,16  
 80:21 110:5 172:3,11  
 172:17 207:10 208:13  
 215:13,16 401:19  
 450:19 461:21 466:8  
 468:14  
**subgroup** 447:12  
**subgroups** 226:3  
 438:21  
**subject** 22:19 92:15  
 128:9 156:1 303:13  
 318:19,20  
**submission** 220:5  
**submissions** 220:2  
**submit** 5:2 6:5 153:1

238:5 239:13,19  
 240:4 244:18 255:6  
 276:14 289:7 317:2  
**submits** 148:22 176:22  
**submitted** 23:7 114:7  
 121:10 122:5 137:11  
 138:2,18 147:12,15  
 156:1 172:6 250:14  
 256:6 268:6 289:5  
 426:13 441:17  
**submitter** 220:14  
**submitting** 276:18  
 448:8  
**subsequent** 109:18  
**subset** 123:7 211:4  
**Subsits** 2:3 9:5,5 37:13  
 202:15 203:21  
**substance** 225:7 226:3  
 302:20 303:3,12  
 467:8  
**substantive** 19:3 213:2  
 213:5 466:17  
**substitution** 441:7  
 444:11  
**subtle** 32:15 33:9  
**subtlety** 118:3  
**succeed** 50:2  
**success** 49:21 140:9  
**successes** 116:12  
 228:7 279:1,5  
**successful** 90:5 220:21  
 307:16 360:8  
**sudden** 298:16  
**suffer** 41:4  
**suffers** 41:4  
**sufficient** 118:14  
 160:10 378:5,6  
**sufficiently** 143:9  
**suggest** 179:5 200:22  
 271:12 331:16 447:3  
 447:8 448:9 464:15  
**suggested** 206:20  
 210:19 451:21  
**suggestion** 77:22 210:9  
 210:19 258:17 342:15  
**suit** 141:19  
**suite** 187:8  
**summarize** 101:13  
**summary** 22:2 115:12  
 130:1 375:21  
**summed** 460:4  
**Sun** 334:1  
**sundae** 236:1  
**sunglasses** 310:1,3,4,6  
 310:12 311:6  
**Sunoco** 11:3 255:2  
 441:8,11,19  
**super** 380:6

**supervisor** 274:10  
**supply** 173:12  
**support** 18:22 19:9,22  
 20:15 26:8 27:9 54:3  
 66:16 67:2 104:10  
 116:15 141:12  
**supported** 27:11  
 147:18 198:19,21  
**supporting** 18:20 225:1  
 242:22  
**supports** 19:17,19 26:2  
 128:18  
**suppose** 439:2  
**supposed** 163:11 286:1  
 404:12 455:20  
**Supreme** 147:21  
**surpasses** 416:5  
**surprised** 320:13  
**surrogate** 49:1  
**survey** 153:11 155:10  
 210:10 372:13 394:1  
**surveys** 153:12,18  
 154:4,17  
**survive** 325:11  
**suspect** 76:2 134:8  
 402:17  
**suspicious** 112:5  
**sustain** 104:5  
**sustainable** 108:16  
**sustaining** 104:14  
**swallow** 290:2  
**swap** 196:12,14  
**swear** 444:2  
**swing** 170:22  
**switches** 291:3,9 295:6  
 295:20  
**system's** 54:18 407:8  
**systematic** 219:19  
**systemic** 245:12  
 350:12  
**systems** 3:13 32:6  
 55:13 58:15 104:20  
 162:7 184:19 203:22  
 230:21 231:5 236:15  
 355:14 356:22 358:1  
 358:2 361:2 365:8  
 369:1 384:11 405:9  
 417:18 418:13 419:8  
 419:9 420:7,14,18  
 422:5 425:11 426:3  
 447:14 449:2 460:18

---

**T**


---

**T** 372:3,3,3  
**T&Q** 196:18  
**table** 15:9 22:1 59:11  
 60:12 86:17 88:8  
 119:4 121:2 134:1  
 194:21 228:17 347:13  
 384:13 423:13 426:4  
**tableau** 423:1  
**tables** 418:18  
**tabulate** 462:1  
**tackle** 78:22 79:5,22  
**tag** 62:10  
**tagged** 64:11  
**tail** 232:7  
**tailor** 336:9  
**takeaway** 414:11  
**taken** 59:14 124:14  
 132:18 194:9 384:16  
 432:1  
**takes** 83:21 201:8  
 260:22 317:1 319:19  
 346:19,20 423:20  
 447:5 462:17  
**talk** 12:20 13:8,15,19  
 14:1,10,19 54:21 76:3  
 79:7 86:5 91:19 105:5  
 108:22 110:12,21  
 129:20 183:14,20  
 185:7 224:8 226:16  
 230:18 231:13 232:11  
 232:19 236:10 238:6  
 238:7 239:3,21  
 240:18 244:21 252:3  
 256:7 265:7 270:11  
 270:13 275:5 277:15  
 279:12 280:4 281:7  
 292:11 294:5 309:20  
 312:20 320:11 343:9  
 343:15 352:11,18  
 353:9 360:11 368:2  
 384:19 402:8,15  
 403:13,20,21 411:2  
 417:3 419:9 432:15  
 435:4 437:10 440:10  
 451:16 458:5 470:14  
 473:20  
**talked** 85:22 86:1 103:9  
 103:19 110:9 127:16  
 138:5 141:2,22 151:4  
 175:7 183:22 200:9  
 202:14 208:2,16,21  
 211:1 228:11 231:2  
 250:3 273:14 274:7  
 274:19 275:3 289:2  
 294:10,13 296:14  
 297:6 301:6 316:14  
 321:4 339:7 340:3  
 399:6 404:3 410:19  
 417:19 426:19 440:12  
 445:5 447:12 448:6  
 452:10  
**talking** 32:8 61:5 88:3  
 92:9 108:21 113:10



- 165:9 176:5 192:10  
202:11 217:7,11,16  
254:10,11 262:19  
264:5 296:15,16  
331:19 349:18 352:21  
352:22 353:1,1,20  
356:19 379:20 406:9  
406:14 410:12 417:6  
432:9 439:14 474:7  
**talks** 31:19 33:22  
288:13 304:6  
**tangible** 80:16  
**tape** 370:2,3  
**TARA** 291:6  
**target** 181:19 208:8  
**tarmac** 180:19  
**task** 21:9,10,11 71:1  
74:10 89:13 188:7  
199:10 225:4 405:16  
**tasked** 51:3 102:15  
**tasks** 405:20 455:17  
**taxi** 289:14 308:17,18  
308:20 309:3,6  
462:19  
**taxiway** 276:8  
**taxonomy** 202:14 203:9  
203:15 207:16,21  
208:20 209:5 444:14  
**teach** 219:20 260:18  
319:15,16  
**team** 26:5 27:13,15  
28:5 54:7 209:17  
213:21 253:19 272:1  
272:3 280:12 405:6  
460:22  
**teamed** 226:15  
**tech** 24:9 25:4 26:12,13  
113:2 281:6 282:1  
309:21 329:11 331:22  
339:5,6 424:19 426:7  
**technical** 11:4 20:3  
26:3 97:11 105:14  
302:6 331:21  
**technician** 260:7  
**technicians** 438:13  
**technique** 394:15 443:3  
443:7  
**technological** 321:20  
**technologies** 31:10,12  
31:13 383:14 389:5  
395:4 396:14,15  
410:6,9 426:3 427:13  
**technology** 10:5 14:7  
40:8 42:13,20 55:6  
66:10 76:17 77:2  
80:11,22 81:17 82:21  
97:14 110:8 175:11  
196:1 208:12 209:16  
213:11 218:20 223:16  
224:5 227:12 236:7  
237:2 290:20 296:16  
296:17 301:16 321:2  
322:3 357:2,3 371:13  
371:15 384:21 387:2  
397:20 398:14 402:20  
408:13 411:10 417:12  
425:1 428:10 430:17  
450:15 458:14 459:3  
459:10 460:4,6 466:7  
**technology-specific**  
357:18  
**tee** 18:4  
**tee-up** 230:16  
**telephone** 270:12  
**tell** 49:20 128:13,16,17  
136:9 204:22 231:7  
232:22 234:2 236:2  
239:17 240:5 244:9  
249:20 260:7,17  
261:2,15 267:2  
270:19 271:4 278:9  
278:10 286:9 290:7  
290:12,14 291:12  
302:17 303:9,18  
308:9 310:12,20  
313:8 316:4 317:14  
317:15,18 318:6,6  
319:11 321:12 326:17  
327:20 330:6 335:3  
338:3 342:2,19 343:5  
343:7 352:14 372:15  
378:10 404:16 411:20  
427:14 462:15  
**telling** 294:6,7 296:4  
300:11 309:21 320:15  
393:15  
**tells** 285:20 298:12  
433:9  
**temperature** 320:19,20  
320:21 322:4 360:2  
**temperatures** 369:21  
**template** 201:16 284:8  
**tempted** 335:16  
**ten** 38:8,14 50:10 89:6  
185:16 233:6,8  
261:12 284:18 287:9  
292:13 297:13 402:2  
420:19 464:18  
**ten-minute** 195:20  
**tend** 33:12 40:20  
**tendency** 76:22 331:7  
**tenets** 151:9 165:7  
217:4  
**Tennessee** 272:8,12  
438:1,8 452:20  
**tenor** 29:22  
**tension** 132:7 150:8  
151:2,20 170:21  
171:12  
**tent** 12:7 112:6  
**terabyte** 427:19  
**term** 60:22 61:4 217:20  
258:15 339:21,22  
421:15 423:6  
**terminal** 308:21 309:5  
**terminated** 306:4  
**terminology** 225:16  
**terms** 22:2 28:21,22  
29:12,19 31:21 33:13  
33:14 43:14 44:5  
52:13,17 53:3 54:12  
57:7,15 60:3 65:8  
70:1 74:15 87:14 92:1  
92:8 94:17 99:20  
110:6 117:9 131:7  
151:8 155:17 159:8  
162:22 167:16 175:16  
184:12 192:2 193:22  
199:18,19,21 200:22  
202:12,17 205:11  
207:18 211:10 213:3  
227:22 411:22 412:1  
412:2 421:12 425:11  
472:11  
**terrain** 299:4  
**terrified** 322:16  
**test** 27:20 180:2 182:8  
314:5,8,16 315:6  
**tested** 179:17 181:5  
182:11  
**testimonial** 59:17  
**testimony** 138:6,7  
**testing** 303:14 309:13  
314:12 315:1,2  
318:21 368:8  
**tests** 180:2 369:15  
**Texas** 166:13  
**Texas's** 166:4  
**text** 425:15  
**texting** 247:2  
**thank** 4:8 5:17 6:19  
25:11 27:15 33:18  
39:22 41:16 43:19  
44:6 45:22 46:3 47:13  
47:15,22 48:13 50:4,6  
52:10 55:14 58:19  
60:9,11 68:20 73:7,7  
73:8,9 78:10,11 85:19  
101:6,19 105:20  
108:18 111:3 112:22  
113:6,7 117:15 119:1  
121:1 136:1 145:18  
147:3 165:21 169:14  
171:15 183:12 186:1  
187:5 188:3 190:15  
199:6 204:13,14  
212:19,21 213:10  
223:13 228:19 231:8  
231:11,20 232:2  
269:1 318:21 322:13  
328:4 336:1 341:10  
342:10 351:12,14,19  
352:1,10 379:9  
390:12 400:21 401:8  
402:11 449:12 450:3  
450:8 460:10 463:6  
466:3 469:5,17 474:8  
474:10,10  
**thanks** 39:20 48:10  
194:19 198:21 204:19  
228:22 252:8 367:16  
367:16 390:8 469:8  
**Thebert** 2:3 11:11,11  
60:13,13,18 61:2 62:8  
62:18 63:4 68:22 70:5  
70:13,21 150:3,9,12  
150:18 152:8 154:7  
155:5 156:5 168:12  
296:1 306:7,15,21  
307:9 311:19 312:4  
312:12 313:10,13,21  
348:17  
**theirs** 80:13 300:7  
352:14  
**theme** 175:13 217:6  
**they'd** 260:6 297:10  
312:13 331:13  
**thicker** 364:14  
**thickness** 361:12  
**things** 112:7  
**thinks** 320:6 435:18,22  
471:7  
**thinner** 456:11  
**third** 68:16 82:2 90:9  
91:10 93:5 117:6  
118:11,17,17 208:14  
214:11 257:4 352:9  
375:4,5 399:5  
**third-party** 96:6 166:17  
174:12 216:6  
**thirdly** 216:20  
**thirsty** 218:14  
**thought** 19:2 57:18  
71:9 76:16 78:21 80:8  
85:16 90:7 95:5 97:15  
105:2 108:20,21  
109:9 111:11 112:8  
115:13 118:6,8  
122:16 123:17 134:12  
140:15 143:10,11  
148:10 206:10 227:9  
284:5 290:15 308:4

342:11 344:22 346:17  
 394:12 396:2 404:12  
 405:3 424:1 448:17  
 461:14 462:14 469:6  
 469:19 472:12  
**thoughtfulness** 213:1  
**thoughts** 33:20 37:11  
 46:3 47:15 52:12  
 56:15 71:7 74:14  
 82:22 99:11 135:2  
 140:7 156:11,14  
 160:8 411:6 468:19  
**thousands** 429:12  
**thread** 323:10 361:20  
**threat** 68:14 133:21  
 134:19 135:2,9  
 137:14 139:1,2 140:3  
**threats** 31:11,14 63:11  
 356:22  
**three** 15:2 35:8,12  
 36:16 74:2 81:15 82:5  
 91:16 96:13 152:13  
 152:15 154:18,22  
 181:3 185:18 215:19  
 225:7 234:21 235:1  
 235:17,19 253:12  
 254:15,18 255:20  
 278:4 286:21 302:13  
 303:11 324:17 332:1  
 334:2 335:13,13  
 346:18,19,21 358:16  
 370:10 401:18 413:10  
 413:14 422:17 435:15  
 436:13 441:9,13  
 461:6 462:16 464:15  
 468:14  
**three-** 253:15  
**three-legged** 96:9,12  
 435:16  
**three-sentence** 132:4  
**three-way** 229:17,18  
**three-year** 108:2  
**threes** 335:17  
**thresholds** 362:3,3  
**throttle** 320:7  
**throw** 109:8 180:4  
 181:18 199:9 200:7  
 367:14 404:13 430:5  
**throwing** 59:10 169:11  
 421:18 462:6  
**thumping** 318:3  
**thunder** 231:8  
**Thursday** 179:16,19  
**ticket** 341:13  
**tie** 81:20 82:2 109:22  
 116:11 117:2 149:17  
 254:15 295:19 368:19  
**tie-in** 336:5

**tied** 98:5 291:3  
**tiering** 192:1  
**ties** 100:14 254:16  
**tight** 43:16  
**tightening** 398:12  
**time-line** 356:2  
**timeline** 17:21 22:12  
**timeliness** 127:15  
**times** 77:16 243:15,21  
 287:9 305:13 324:9  
 325:7 366:17 369:5  
**tinkered** 464:11,13  
**tip** 253:18  
**tire** 260:3,6,8,10,10,17  
 260:18,21 261:3,16  
 284:1  
**title** 6:21 32:16 214:6  
**TLAs** 232:15  
**TMC** 213:12  
**TMQ** 213:12  
**today** 4:13 5:19,22 10:4  
 13:22 14:14 21:16  
 24:5,8 25:16 29:17  
 32:2 36:8 44:13,15  
 46:9 63:5 70:9 74:19  
 84:22 88:15 110:10  
 170:1 174:3 176:2  
 184:1 193:19 199:19  
 200:4 201:20 208:21  
 210:4,5 217:20 219:3  
 352:19 375:13 392:21  
 403:13 433:12 440:2  
 440:2 464:3 466:19  
**today's** 14:21,22  
**token** 416:13  
**told** 85:22 271:19  
 278:13 281:14 289:14  
 310:13 319:7  
**tolerances** 418:6  
**Toman** 2:12 230:17  
 232:5,22 233:8  
 234:12 235:3 237:3  
 237:22 239:11 244:11  
 249:22 251:5 252:15  
 253:14 255:16 256:1  
 259:4,7 262:12  
 264:18,20 265:6,14  
 267:4,18,21 268:2  
 271:7,10 274:8  
 276:12,17 278:9,16  
 279:8 280:17 282:20  
 286:8,11,15 287:19  
 288:1,17 292:4 293:5  
 293:17 294:1,4 296:6  
 296:22 297:2,6  
 300:16 301:13 302:19  
 303:4,22 304:21  
 306:13,16 307:6,17

310:14 312:21 313:2  
 314:17,20 316:6  
 324:2 325:16,19,22  
 328:10,13 329:17  
 330:17 331:4 333:6  
 334:16,19 336:8  
 338:11 339:18 341:15  
 344:9 348:19 349:18  
 349:22 351:2,5  
**tomorrow** 257:15 335:2  
 463:2  
**ton** 57:1,13 406:3  
**tool** 64:10,15,17 98:11  
 139:12 141:8 143:18  
 143:21 338:1 354:12  
 358:19 359:5,6,9,14  
 360:3,12,15,16,22  
 361:6,8,10,17 362:22  
 363:3,7 364:5,7,9,17  
 365:1,4,14 366:3,6,17  
 368:4,11,12,14,17,18  
 369:1,10,11,16,20,20  
 370:4,15 371:3,5  
 372:2,6 373:13,14  
 374:11,20 381:16,18  
 383:10 385:9,12,18  
 385:19 386:4,12  
 389:8 391:13 392:22  
 395:18 396:5,7,10,11  
 397:15,21 398:3,7,9  
 398:10 438:3,8  
**tools** 35:9 131:11,11  
 162:16,20 167:9  
 354:15 356:21,21  
 361:5,10,11 370:1  
 374:9 386:16 395:4  
 413:16,20 423:2  
**top** 279:12 413:14  
**topic** 100:3 105:16  
 110:11 353:15  
**topics** 79:9 86:14 213:5  
 378:1  
**torn** 252:2  
**totally** 51:9 58:13  
 147:22  
**touch** 405:2  
**touched** 43:13 191:15  
 336:4  
**touching** 409:16  
**tough** 290:2  
**tower** 250:9,15,16  
 251:6,12 252:2,6  
 264:13  
**town** 251:9  
**traceability** 365:5  
 377:18  
**track** 17:21 225:2  
 264:10 457:12

**tracked** 177:15 415:5  
 415:16  
**trade** 57:20 231:14,15  
**traditional** 35:21 41:20  
 43:1 51:11 66:12  
 151:15,15 414:3  
 422:8  
**traffic** 277:4 415:19  
**train** 215:14 218:5,9  
 220:6 390:6  
**trained** 268:3 282:6  
 308:22  
**training** 7:6,8 10:8 11:6  
 157:13 195:22 213:12  
 213:15,17 214:4  
 215:20 218:2,3,22  
 219:10,10,17,19  
 220:1,20 221:14,15  
 221:18,20 222:14  
 245:8 268:4 271:11  
 271:14,16 275:15,16  
 275:16 291:21 306:17  
 307:4,7 310:11 316:4  
**training's** 340:17  
**trajectory** 25:18  
**trampolines** 17:5  
**transcript** 11:20,21  
 12:7 39:3 101:8,14,21  
 119:11 138:10 470:19  
 471:8 472:17  
**transcription** 20:1  
 470:8  
**transcripts** 16:4 102:16  
**transfer** 10:17 11:4  
 39:9 44:9,10 45:16  
 55:21 191:11 194:6  
 198:10 410:11 416:9  
 420:6,8,17  
**transferred** 418:12  
**transform** 419:4  
**transformed** 90:12  
**transition** 100:19  
**translating** 57:9  
**translation** 29:2  
**transmission** 91:6 97:2  
 97:6 157:4 168:14  
 171:2  
**transparent** 287:12  
**transponder** 291:5,6  
**transportation** 1:1 5:1  
 5:3 9:6 18:14 19:12  
 147:19  
**trapezoid** 17:5  
**traveling** 340:18  
**travels** 474:11  
**TRC** 2:13 10:11 402:20  
 402:22 403:2,4  
**trees** 6:14 248:1 320:9

**tremendous** 73:22  
 332:2  
**trenches** 235:3  
**trend** 333:21 454:4  
 456:3,14  
**trending** 129:14 219:2  
 268:21 334:20  
**trends** 86:12 248:13  
 262:19 268:17 334:9  
 386:5 423:9,17 439:6  
 457:14  
**triage** 264:4  
**tribal** 133:14 144:12  
 243:20  
**tricky** 63:3 303:22  
 304:1  
**tried** 91:16 117:12  
 406:2  
**tries** 204:11  
**trip** 131:15 141:8  
 289:20  
**triple** 308:13 309:3  
**trivial** 446:20  
**trivialized** 444:3  
**trouble** 143:22 163:9  
 283:7  
**true** 71:4 285:18 402:17  
 437:2  
**trust** 8:19 34:12 36:8,13  
 39:5 46:16 50:13 57:4  
 87:2 89:9,11,11,12  
 136:22 163:17 245:14  
 257:13 265:11 348:15  
 394:17,17  
**truth** 303:18 459:4,5  
**try** 6:3 40:8 56:15 72:9  
 73:4 77:8 79:5 82:1  
 92:17 112:19 138:17  
 172:17 185:19 203:11  
 224:7 245:1 352:6  
 459:15 469:13  
**trying** 16:19 45:9 60:19  
 62:12 69:2 72:9,20  
 79:22 97:15 98:18  
 112:5,18 121:21  
 122:22 124:5 126:4  
 136:18 140:19 141:5  
 147:8 149:17 150:19  
 159:11,18,19 161:11  
 162:8 167:4 168:12  
 192:22 205:10 217:7  
 283:6 354:14 358:6,8  
 359:4,13,16 373:5  
 378:7 392:13 427:14  
 448:20 455:16  
**Tu** 52:16,16 53:14  
 54:16 113:9,9 173:16  
 173:16 344:16 345:5

**Tundra** 327:13  
**turn** 6:17 12:16 14:6  
 24:12 161:17 163:7  
 246:14 284:14 291:5  
 330:15 402:3 424:4  
 428:19  
**turned** 248:1 276:7  
 348:8  
**turning** 369:4 429:7  
**turns** 174:12 187:19  
 235:17 282:3 286:22  
 392:10 456:9  
**tweaked** 93:19  
**tweaking** 97:18 98:1  
**twice** 23:13 279:9  
 390:12,13  
**two** 27:19 30:6 79:9  
 82:7 84:3 98:3 100:3  
 100:11 111:9 125:11  
 125:22 214:5 217:1  
 218:4,13 227:17  
 235:17,18 247:13  
 253:18 263:15 267:22  
 272:1 273:19 277:6  
 281:18 298:20 308:2  
 308:12,13 309:2  
 311:11 316:6 321:16  
 324:17 325:11 333:2  
 333:4 342:19 349:10  
 350:17 359:12 389:14  
 395:8 417:8 418:20  
 419:9 420:18 423:7  
 430:15 436:1 463:1  
 464:15 467:8 469:6  
**two-and-a-half** 381:6  
**type** 110:18 152:19  
 172:9 181:16 183:19  
 204:18 218:22 221:7  
 259:8 265:2 267:9  
 318:17 344:8,18  
 352:20 361:19,20  
 362:2,3 363:4 395:14  
 399:20 416:15  
**types** 81:14 103:10  
 126:15 175:7 176:4  
 192:4 206:18 209:2,6  
 220:2 361:13 363:5  
 364:2 393:7 395:4  
 400:12,19 408:11  
 410:3 425:7 427:5  
 430:9 438:12 444:8  
 445:6 446:17 452:21  
**typical** 237:15 248:15  
 306:2 419:21  
**typically** 84:1 89:11  
 92:21 106:19 137:5  
 157:22 235:14 236:22  
 253:9 306:6 386:19

388:10 413:6 420:7  
 451:12  
**typing** 347:17

---

**U**

---

**U** 18:17  
**U.S** 311:21 312:18  
**Uber** 462:16,19  
**uh-oh** 264:16 266:6  
**ultimate** 34:21 50:3  
 54:4 84:14 373:18  
**ultimately** 4:21 18:13  
 34:13 37:2,19 53:21  
 71:18 78:19 79:1 80:1  
 92:5 95:1 184:3  
 217:17 356:15 358:6  
 396:8  
**umbrella** 46:12,13  
 128:7 357:5  
**unable** 21:12 180:2  
 470:7  
**unanimous** 253:13  
**unassailable** 47:11  
**unassociated** 51:5  
**uncertainty** 96:14  
 397:15 398:6,7  
**unclear** 127:18  
**under-call** 386:7,8  
**underlying** 44:4  
**undermine** 140:16  
**underneath** 134:18  
 135:8 219:5  
**underpin** 19:21  
**underpinnings** 100:11  
**underscores** 449:13  
**understand** 26:15,17  
 33:8 42:19 50:18  
 83:22 119:14 134:8  
 141:6 160:5 164:20  
 171:6 187:15 200:1  
 210:11 229:6 230:7  
 259:1 261:10 330:12  
 336:1 380:19 397:15  
 400:18 417:18 431:5  
 432:17 433:9 445:20  
 449:5 451:11 459:10  
**understanding** 35:5  
 56:21 65:13 122:10  
 146:22 187:9 212:7  
 227:5 240:14 313:3  
 386:15 400:10 418:3  
 422:15 442:7 453:15  
**understands** 176:11  
**understood** 171:10  
 379:12 417:13  
**undo** 441:21  
**unfettered** 62:16  
**unfortunate** 51:16

**unfortunately** 315:12  
 464:18 470:10  
**uniformity** 398:1  
**union** 10:22 189:8  
 257:20 259:5 277:13  
 305:17 329:12  
**unionized** 258:22  
**unions** 248:10 252:3  
 253:9 257:1 258:10  
 258:17,21 281:2  
**unit** 236:7 363:18  
 436:20  
**United** 1:1 70:4 263:22  
 265:19 274:17 294:20  
 312:7 314:2 315:17  
 315:18  
**unity** 384:20 386:1  
 387:22 388:11 395:14  
 397:11 423:20,22  
**universe** 170:7  
**universe's** 170:8  
**universities** 254:8  
**University** 8:1 319:15  
**unnecessary** 140:6  
**unstable** 335:11  
**unstructured** 408:4  
**unusual** 365:5 371:14  
 400:3  
**up-front** 109:12  
**update** 355:18  
**updated** 355:20 414:19  
 415:4,5  
**upend** 72:9 73:1  
**upfront** 311:4  
**UPS** 315:19  
**upset** 281:17  
**upstream** 370:15  
**urgent** 178:15  
**usable** 436:11  
**use** 25:20 36:6 56:7,8  
 61:5 65:19 67:13  
 68:18 78:21 81:16  
 85:11 108:9 115:11  
 120:15 126:12,12  
 127:22 129:15,22  
 130:13,16,20 133:19  
 135:11,14 137:11  
 138:1,18 140:13  
 148:1 154:1,5,14  
 157:18 158:11,22  
 165:17,20 177:22  
 179:12,13 192:2  
 203:14 217:11,19  
 232:15 240:19 259:2  
 261:17,17 262:22  
 283:8 285:16 286:5  
 300:5 303:3 363:16  
 363:17,18,19,20

370:14 371:1 379:2  
381:16 382:7 395:6  
395:13 413:9 414:8  
415:14 417:22 426:11  
428:19 431:11 433:5  
434:20 438:8 439:5  
444:8,11 445:22  
452:5,8,20 460:20  
470:1  
**useful** 167:3 228:7  
405:14 408:18 427:2  
428:11 472:10  
**user** 109:14 416:21  
423:19 426:14  
**user's** 449:18  
**users** 331:10 417:15  
**uses** 439:5  
**usually** 255:17 259:7  
259:12 280:18 314:14  
314:15 326:9 386:2  
419:10  
**Utilities** 9:6  
**utility** 10:21 189:8  
190:7 203:18  
**utilization** 65:4  
**utilize** 204:11 462:10  
**utilized** 124:22 139:13  
139:15 140:22 141:8  
160:14 161:2,3,5  
**utilizing** 219:18

---

**V**


---

**vacation** 199:4 224:20  
**valid** 362:13 367:2  
**validate** 221:2 370:11  
371:11  
**validated** 370:17 418:7  
**validating** 371:7  
**validation** 371:18  
372:22 373:1 381:15  
458:19  
**validity** 424:22  
**valuable** 88:6 158:19  
182:21 184:11 194:2  
209:7  
**value** 159:11 191:13  
192:5,11 228:8  
242:12,12 271:3  
365:17  
**variables** 47:19 394:18  
394:20 433:16,18  
**variety** 66:11 185:10  
217:18 356:22 389:22  
410:5  
**various** 47:18 94:18  
97:10,11 107:1 127:8  
134:12 200:15 204:16  
207:15 209:6

**VC** 389:17  
**Veenstra** 2:13 222:18  
402:21 405:18 409:8  
424:8 434:8 444:15  
450:17 451:5,7,12  
453:8 455:8 456:18  
458:10 459:22 460:11  
460:15 465:1 466:2  
**Vegas** 298:3,4,5,15,15  
298:22  
**velocities** 360:13  
**vendor** 91:15 174:12  
218:18 354:5,9,19,21  
359:3 360:1 361:16  
365:20 366:15 368:7  
373:16,21 374:11,20  
376:11,11 380:21  
381:8,11,15 382:2  
383:11 396:10 399:2  
399:8 408:13 412:7  
423:21 442:5 444:11  
452:20  
**vendors** 91:1,10 92:10  
93:5 97:1,11 376:5,13  
389:1 395:1 399:18  
399:22 412:12 413:19  
427:8 432:20 445:6  
454:19  
**venture** 403:3  
**verbatim** 217:22 219:15  
**verge** 68:13  
**verification** 370:9,13  
371:21 422:4  
**verification's** 407:9  
**verifications** 452:19  
**verified** 458:12  
**verify** 457:5  
**vernacular** 403:19  
435:3 460:9  
**versa** 359:12  
**versatile** 204:8  
**versus** 49:15 168:13  
188:1 191:6 218:16  
269:21 341:12 359:20  
371:5 385:9,18,19  
389:20 439:15 445:10  
**vertical** 428:14,22  
429:18  
**vetting** 216:20  
**VFW** 264:13  
**viable** 110:16 113:10  
**vice** 8:12 9:10 10:3,16  
359:12  
**Vickie** 2:12 230:17  
232:5,22 233:1,10  
234:11 238:18 244:9  
249:20 252:14,15  
254:1 263:7,13 274:6

275:22 280:9 289:10  
290:9 293:2 294:22  
301:20 302:12,17  
304:16 316:4 317:13  
317:16 319:11,14  
323:16 332:12 349:14  
352:14 367:11  
**Vickie's** 233:2 234:10  
252:19 266:16 327:20  
339:3 350:11  
**video** 309:10,10,12,12  
**view** 59:14 151:2  
384:21 385:4 418:22  
**vintage** 456:16 459:3  
**violating** 61:16 136:22  
**violation** 61:9 68:8,13  
126:14 149:8 152:14  
177:17 239:6,8 269:7  
302:22  
**violations** 149:3 242:15  
269:18,21 302:15  
**Virginia** 1:13  
**visible** 51:4 136:14  
**vision** 27:21 28:16  
56:22 62:6 136:12  
139:22 174:22  
**visit** 16:7 75:16 365:9  
**visual** 200:8 298:7,9  
355:7 388:15  
**visualization** 423:1  
**visualize** 404:2 410:11  
**Vivec** 87:9 104:2  
117:19  
**Vivek** 75:4 82:9 83:3  
222:2 280:2,2  
**vocabulary** 403:19  
**voice** 141:13 230:22  
**voices** 12:11  
**voids** 153:19  
**volume** 264:3 416:1  
**voluntarily** 67:7 115:1  
121:16 133:6,16  
147:15 148:16,21  
174:1 176:22 217:8  
238:5,20  
**voluntariness** 34:8  
**voluntary** 1:4,11 4:8,14  
4:18 11:17 32:16,18  
34:1 50:11 51:5 60:1  
64:14 72:14 75:7,19  
79:13 89:7 90:12 91:2  
94:6 121:18 148:2,2  
149:9 160:13,20  
161:4 164:1 167:13  
172:1,12 184:11,19  
184:21 190:3 192:15  
193:2,13 262:17  
294:18,20 312:10

338:5 350:2 351:4  
423:10  
**volunteer** 35:8 259:12  
308:1  
**volunteered** 269:4  
**vote** 25:16 212:16  
472:21  
**voted** 21:17  
**voting** 24:6 88:13,14  
200:3  
**VSD** 350:14,15  
**vulnerability** 87:13

---

**W**


---

**wait** 61:20 103:2 274:9  
302:13  
**waiting** 158:16 404:18  
**wakes** 237:19,20  
**walk** 164:4 247:8,9,11  
343:5  
**walkaround** 260:2  
**walked** 332:21  
**walking** 182:8 341:18  
465:13  
**wall** 361:12 364:13  
456:10 458:11,12,16  
458:19  
**walls** 171:1  
**Walter** 1:22 10:6 28:1  
60:10,11 178:17  
180:12 188:22 191:9  
194:17  
**Walter's** 187:7  
**wanted** 15:5 20:19  
29:17 35:5 41:1 48:6  
66:15,16 74:6 78:12  
81:11 95:2 130:11,12  
130:13 136:17 187:7  
219:13 379:11 392:3  
404:7 406:4 412:5,8  
446:2 448:10 449:13  
463:5,5 469:9  
**wanting** 146:12 283:7  
**wants** 48:3 65:11,17  
67:11 144:13 168:5  
172:21 183:14 189:16  
342:1 345:18  
**Wapner** 308:6  
**warehouse** 421:10,16  
422:9 446:7  
**warehouses** 421:8,17  
**warmed** 50:11  
**warn** 463:6  
**warned** 322:10  
**Warner** 2:4 10:3,3 31:6  
31:6 74:21 87:5,5  
115:20,22,22 116:6  
116:17 196:10,11

223:17 224:7 226:13  
 228:21 379:11 403:8  
**warning** 12:12  
**warp** 222:13  
**Warren** 74:2,4,5 204:19  
**warts** 303:19  
**Washington** 9:6 16:22  
 59:7  
**wasn't** 64:8,10,13 65:15  
 155:10 165:2 180:2  
 198:20 199:6 301:15  
 347:8 437:14  
**watch** 40:21 42:20  
 235:22 395:7 412:14  
**watches** 395:8  
**water** 298:11,14  
**ways** 40:8 41:10 86:3  
 89:16 92:8 127:8,9  
 130:21 137:6 164:21  
 192:3 200:12,21  
 209:15 308:7 311:22  
 409:10 410:11 444:2  
 444:6 446:10 455:2  
 473:7  
**Waze** 107:1,9  
**weakening** 138:12  
**weaknesses** 151:10  
**wealth** 353:18 355:5  
**wear** 254:16 310:12,15  
 311:17  
**wearing** 254:15 309:22  
 311:6  
**weather** 158:3 237:7  
**web** 16:7 76:12 217:17  
**Web-based** 221:17  
**website** 11:22  
**WEDNESDAY** 1:9  
**weeds** 131:6  
**week** 198:20 208:22  
 263:15 264:14,16  
 267:6,17,18,19,22  
 271:6 326:12 469:14  
**week-and-a-half** 469:14  
**weeks** 247:13 273:19  
 278:5 302:14 332:1  
 350:17 455:11  
**weigh** 28:3 296:21  
**weighed** 296:21  
**weighing** 171:13  
**Weimer** 96:11  
**weird** 239:7 325:15  
**welcome** 3:2 4:3,7  
 76:18 83:1  
**Wen** 52:16 113:9  
 173:16 440:1  
**Wen's** 403:17  
**went** 84:4,18 107:7  
 147:20 195:17 197:11

198:2 213:1 224:2  
 230:2 264:6 270:7,15  
 273:7,9 284:4 298:16  
 309:20 320:11 352:3  
 453:21 461:2,4  
 474:13  
**weren't** 15:1 159:2  
 234:1 274:11 316:20  
 348:2 465:9  
**wet** 261:20  
**wheel** 286:5 369:4,6,6  
 376:10  
**wheelhouse** 332:6  
 367:18  
**WHETSEL** 2:13 462:2,9  
 463:3  
**whip** 297:9  
**White** 2:14,14 7:5,6,9  
 7:10 27:12 213:20  
 276:20 277:3,11,17  
 277:19  
**whoa** 265:7  
**whoever's** 26:16  
**whys** 212:8  
**wide** 356:22 385:14  
 389:22  
**widely** 380:18 381:1  
**wider** 97:10  
**wiggle** 132:19  
**wild** 241:5  
**willing** 36:14 45:17 81:9  
 167:5  
**willingness** 44:11,19  
 44:21 45:1 84:11  
**wind** 70:19  
**window** 236:6 310:7  
 311:16  
**windows** 310:7  
**windshield** 247:4  
**wing** 289:18  
**wings** 289:16 290:1  
**wire** 447:15  
**wise** 306:8  
**wish** 165:5 399:12  
 402:8  
**Wishful** 450:16  
**withstand** 148:8  
**wonder** 163:18 325:1  
 343:2  
**wonderful** 98:6  
**wondering** 116:3  
 122:20 178:20 210:20  
 394:11  
**Woo-hoo** 285:12  
 340:14  
**woods** 282:7  
**word** 36:6 129:2 137:7  
 346:12 358:5 410:8

**wording** 100:1,8  
**words** 37:7 85:9 177:6  
 184:6 209:14 250:22  
 396:4 405:8 407:5  
**wordsmith** 93:13  
**wordsmithing** 96:22  
**wore** 310:3,4  
**work-related** 269:15  
**workaround** 327:1  
**worked** 56:20 73:21  
 89:5 135:17 151:16  
 162:21 165:1 200:8  
 233:11 257:22 309:20  
 435:8  
**workers** 10:22 179:2,13  
 180:6,10 189:8  
**workforce** 244:1  
**workgroups** 225:7  
 305:11 328:17  
**working** 1:5,12 4:9 5:2  
 11:18 13:21 16:7  
 21:14 22:13,21 27:3  
 35:9 45:3 48:21 49:8  
 52:4 53:19 75:14 94:4  
 99:14 107:3 108:12  
 129:11 154:22 183:8  
 209:15 210:14 216:4  
 216:9,22 223:7 226:4  
 226:10 231:5 234:1  
 245:15 253:19 258:11  
 287:13 308:13 316:10  
 316:10 337:13 340:7  
 346:20 347:14 355:20  
 369:17 391:9 393:6  
 394:6 414:16 426:21  
 429:12 451:20 452:2  
 453:1,3 469:8  
**works** 28:17 80:17  
 136:7 139:22 202:1  
 239:3 246:5 252:9  
 265:22 278:8 326:5  
 338:6 343:18 344:12  
 345:11 346:3,4 380:7  
 410:15 418:14  
**workshop** 451:14  
**workshops** 461:20  
**world** 236:14 240:13  
 241:10 244:8 246:8  
 246:12 253:8 254:4  
 257:13,15 259:22  
 269:20 271:20 277:8  
 277:21 290:17 295:2  
 307:11 309:11 316:5  
 318:1 320:17 321:18  
 322:1 325:10 326:13  
 327:8 329:16 331:12  
 331:20 344:2,3  
 345:12 347:5 348:3

385:10 404:17 409:2  
 436:12 438:17  
**world's** 325:1 404:13  
**worldwide** 311:20  
**worried** 50:2 87:21  
 405:11 460:5  
**worry** 87:22 132:2  
 427:12 430:18 450:16  
**worrying** 430:19  
**worse** 267:1,2  
**worth** 92:18 165:10  
 169:13 210:17 250:22  
**worthy** 47:3 191:16  
 387:19  
**would-be** 114:17  
**wouldn't** 43:6,7 45:21  
 59:13 67:13 146:10  
 151:17,18 158:22  
 169:2 229:20 244:6  
 307:3 312:13 330:4  
 330:14 331:8,9  
 394:16  
**wow** 268:1 279:21  
 299:21 311:1 321:5  
**wrap** 71:7 411:7 425:17  
**wrapped** 309:18  
**wrapping** 375:2 422:14  
 437:1  
**wrenches** 330:15  
**wrestle** 172:16  
**wrestling** 31:8 228:12  
**write** 128:15 146:16  
 205:15 250:21 276:8  
 277:19 278:4 293:1  
 472:21  
**write-up** 116:7  
**writer** 113:2  
**writers** 20:3 24:9 25:4  
 26:4,12,13  
**writes** 278:12 327:18  
**writing** 65:9 81:5 131:7  
 189:18 201:18 205:21  
 209:9 261:19 472:8  
**written** 6:6 26:21  
 119:16 205:18 242:5  
 326:11,14  
**wrong** 58:5 60:22 70:14  
 84:4,18 128:15 249:6  
 270:6,15 271:5 276:7  
 281:15 282:4 284:6,7  
 320:19 322:4 326:8  
 326:12,22 372:6,7  
 446:4 448:20 449:3  
 453:21  
**wrote** 243:13 281:13  
 285:18 430:11  
**www.regulations.gov**  
 12:1

<b>X</b>	<b>York</b> 9:19 64:5 106:7 229:16 245:11	<b>18th</b> 99:1 <b>192</b> 32:3 61:8,9 71:4 155:2 <b>192.605</b> 61:16 62:5 <b>195</b> 378:11 <b>19th</b> 99:1 <b>1st</b> 251:2 260:2 272:21 273:2	<b>3300</b> 298:12 <b>3338</b> 298:13 <b>350</b> 243:12,13 <b>352</b> 3:13 <b>360</b> 206:17 <b>370</b> 243:12
<b>X</b> 434:13 456:8 <b>X's</b> 443:5 <b>XML</b> 417:10 418:13 420:1	<b>Z</b>	<b>zero</b> 358:7 <b>zetabytes</b> 428:3 <b>Zuniga</b> 403:9 444:21	<b>4</b>
<b>Y</b>	<b>0</b>	<b>2</b>	<b>4</b> 3:2 82:9 121:5,5 123:1 196:3 401:12 <b>4:00</b> 196:11,18 <b>4:15</b> 434:22 <b>4:55</b> 474:13 <b>40</b> 446:17 <b>40,000-foot</b> 152:3 <b>402</b> 3:15 <b>41,000</b> 236:22 <b>42</b> 404:19 409:7 448:17 <b>43</b> 247:13,19 250:3 267:12 334:13 <b>45</b> 8:11 <b>450,000</b> 452:18 <b>464</b> 3:18 <b>474</b> 3:20 <b>4E</b> 202:4
<b>Y</b> 434:14 <b>Yankees</b> 251:11 <b>year</b> 5:10 8:12 16:21 17:12 19:4 22:15 23:3 23:8,10 98:18,19 152:13 157:20 242:4 243:3 263:19,20 266:22 278:14 279:9 306:1 315:17 317:20 317:21 322:13 323:3 325:3 327:5,5 370:16 376:17 390:6 392:10 416:4,6 460:13,14 <b>years</b> 8:11 38:7,14 49:17 50:10 83:22 84:3 89:6 98:12 104:18 109:18 152:10 152:13,15 153:13 154:4 181:3 185:17 185:18 222:11 232:10 233:3,6,9,11 234:15 241:21 242:19 257:14 260:5,5 261:12 263:9 271:22 274:2 280:10 284:18 292:13 296:7 296:18 297:13 298:22 300:10 308:12 324:16 324:16,17 329:18 332:10 343:20 346:18 346:19,21 374:12,13 374:14,17 375:14,14 381:6 404:18 411:13 420:20 435:10 <b>yells</b> 269:9 <b>yesterday</b> 15:1 23:14 23:20 38:16 41:11 74:7 75:1,14 76:5 77:4,17 80:13 81:2,6 82:9,21 83:2,7 85:4 85:11,17 87:10 104:2 108:9 116:1 117:19 118:4 188:7 191:21 195:17 200:10 201:11 202:16,22 213:19 215:9,17 222:2 223:4 224:21 237:7 280:3 294:14 437:14,15 466:19 <b>yesterday's</b> 198:22 226:21 <b>Yiming</b> 1:20 7:22	<b>0102</b> 202:1 <b>04</b> 375:7 <b>08</b> 375:7	<b>2</b> 83:15 113:16 229:11 371:1 374:7 401:19 <b>2:00</b> 229:18 <b>2:44</b> 352:3 <b>2:50</b> 352:4 <b>20</b> 1:9 223:7 241:20 260:5 261:6,7 296:7 <b>20-</b> 242:3 <b>2009</b> 315:10,15 <b>2010</b> 297:17 <b>2013</b> 154:16 <b>2016</b> 4:16 <b>2016-0128</b> 6:7 <b>2017</b> 317:21 323:3 <b>2018</b> 1:9 5:10 98:20 154:16 <b>2020</b> 108:3 <b>22nd</b> 16:12,13 <b>231</b> 3:11 <b>23rd</b> 16:12,15 <b>24</b> 274:8,13,17 289:3 302:12 <b>24-H</b> 381:19 <b>24/7</b> 266:3 <b>25</b> 3:9 19:7 329:18 458:13,13 <b>25,000</b> 327:5 <b>27</b> 324:16 <b>28</b> 320:4,5,6,15,16 321:18 <b>29th</b> 23:12 <b>2nd</b> 76:10 77:7 110:12 208:10 468:13 <b>2X</b> 456:10	<b>4000-foot</b> 152:3 <b>402</b> 3:15 <b>41,000</b> 236:22 <b>42</b> 404:19 409:7 448:17 <b>43</b> 247:13,19 250:3 267:12 334:13 <b>45</b> 8:11 <b>450,000</b> 452:18 <b>464</b> 3:18 <b>474</b> 3:20 <b>4E</b> 202:4
	<b>1</b>	<b>3</b>	<b>5</b>
	<b>1,000</b> 86:5 <b>1.5</b> 438:3,8 <b>1:02</b> 224:3 <b>1:30</b> 15:15 195:18 223:18 <b>10</b> 4:15 29:4 86:4 154:1 169:7 223:6 243:15 243:21 260:11,12 <b>10,000</b> 381:19 <b>100</b> 150:13 158:3 168:15 280:14 285:5 285:10,11 286:1 326:18 385:13 <b>1000</b> 250:22 263:18 271:21 276:5 280:14 <b>102</b> 355:2 <b>11</b> 3:4 <b>1163</b> 3:13 14:2 74:17 201:19,22 210:3 211:12 353:4 355:14 357:4 370:11 377:2 378:3 381:7 <b>1173</b> 81:22 219:14,15 <b>12</b> 3:6 169:7 222:11 <b>12-month</b> 158:11 <b>12,000</b> 263:19 333:19 <b>12:08</b> 198:2 <b>12:29</b> 198:3 <b>12:59</b> 224:2 <b>120</b> 376:16 <b>121</b> 288:5 <b>128-bit</b> 420:2 <b>13</b> 214:6 <b>14</b> 375:14 <b>15</b> 158:12 234:15 260:11,12 424:9 <b>15,000</b> 263:20 271:21 <b>150</b> 376:17 <b>16</b> 236:4 <b>16-</b> 235:15 <b>16th</b> 17:15 <b>178</b> 321:17 <b>17th</b> 17:15 <b>18</b> 158:6	<b>3</b> 113:16 114:2,2 123:4 123:10 129:20 271:21 351:16 371:8,18 374:7 <b>3:40</b> 195:21 <b>30</b> 232:9 233:3 257:14 300:9 324:16 332:10 343:20 347:17 461:10 462:17 <b>30,000</b> 248:18 <b>300,000</b> 325:3 <b>3000</b> 243:16	<b>5</b> 133:4 154:1 158:2 196:3 336:11 401:14 401:22 466:14 <b>5:00</b> 196:8,8 266:1 335:8 401:11 464:19 <b>50</b> 69:6 260:5 274:2 296:22 309:6 458:11 458:15,19 <b>500</b> 260:9 <b>50s</b> 241:4
		<b>7</b>	<b>8</b>
		<b>7</b> 148:10 308:13 309:3 <b>70</b> 249:13 <b>727</b> 234:17 <b>73</b> 319:22 321:2 <b>73's</b> 321:1 <b>73s</b> 322:2 <b>75</b> 70:2,3 <b>787</b> 234:19 235:7 236:9 <b>7A</b> 290:20	<b>8</b> 176:6

8.7 258:14  
8:30 1:13  
8:32 4:2  
80 392:9  
80s 245:18

---

9

---

9:00 266:1  
90 174:11 258:10  
900 452:18  
90s 238:22  
98 248:21

C E R T I F I C A T E

This is to certify that the foregoing transcript

In the matter of: Voluntary Information Sharing  
Working Group Meeting

Before: USDOT/PHMSA

Date: 06-20-18

Place: McLean, VA

was duly recorded and accurately transcribed under  
my direction; further, that said transcript is a  
true and accurate record of the proceedings.



-----  
Court Reporter

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701